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Sources of Ethiopia's Export Growth: a Constant Market Shares Decomposition Analysis

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Abstract *Ethiopia's exports grew by more than 700% in real terms between 1995 and 2014. For a landlocked country depending much on primary products and with little success in export diversification, the growth recorded over the past two decades is no mean feat. In this study we assessed the sources of this rapid export growth during the post-reform period of 1995-2014. We employed a refined version of the constant market shares model that overcomes the "order-problem" and the "index number problem" inherent in its "traditional" formulation. Our decomposition exercise reveals the importance of two key factors as drivers of Ethiopia's export growth: the growth in total world trade and improvements in Ethiopian competitiveness. While the geographic distribution of the country's exports has been favorable, an unpleasant outcome is that the composition of the country's exports has been slowing down the growth of its exports over the past two decades.*

Key words Africa, Ethiopia, export growth, constant market shares, competitiveness, commodity composition

JEL Codes: F1, F14

1. Introduction

One of the most indisputable and longstanding ideas in development economics is the key role that rapidly growing exports play in the process of economic growth and hence development of a country. At the macro level, as put vividly by Samen (2010), '(i) exports help generate foreign exchange; (ii) export receipts are vital to finance imports and exports; (iii) the small size of many developing countries and their negligible purchasing power call for the need to explore larger market scales; (iv) exports contribute to employment and growth of national product.' In addition, at the firm level, it is argued that exporting firms are more productive than non-exporters (Bigsten *et al*., 2002; Mengistae and Patillo, 2002). Importantly, international cross-country evidence also indicates that rapid export growth and openness are good for poverty reduction (Dollar and Kraay, 2001).

Our paper is broadly related to research in international trade on the sources of growing exports. In a cross-country context, perhaps following different empirical strategy, the study of the underlying sources of export earnings growth has been given a central place in the literature (see, *inter alia,* Redding and Venables, 2003, 2004; Fugazza, 2004; Brenton and Newfarmer, 2007; Easterly and Reshef, 2010). Given the vital economic importance of rapidly growing export sector, this paper particularly focuses on examining the sources of Ethiopia's rapid export growth over the period 1995-2014. In spite of the paucity of export growth in the past and the general lack of export diversification, Ethiopia has seen more than 10-fold increment in its merchandise exports (in current USD) from its 1995 value of about $422 million to $4.4 billion in 2014. That is, Ethiopia's exports grew by 951.6% between 1995 and 2014 in nominal terms.

For a landlocked country depending much on primary products and with little export diversification, the growth recorded over the past two decades is no mean feat. Indeed, the real growth in exports registered during this period has been robust both by historical as well as comparative standards. In historical standards, on average, real exports grew by -4.8% annually during the period 1975-1991 as compared to 13.3% during 1992-2013. Moreover, in comparative context, the country's export grew by 700.7% in real terms between 1995 and 2014. This performance is in sharp contrast to the 155.4% and 245.9% growth rates for SSA and the world registered during the same period, respectively. Despite the rapidity of export growth(as the expansion starts from a very small base), the size of the export sector remained too small as reflected in the country's share of global exports and its insignificant contribution to the overall economy[1]. The aim of this paper is not one of accounting the underlying reasons for the relatively small size of the export sector. Neither is interested in estimating the impact

[1] Indeed, in spite of the relative superiority of export growth and despite trade reforms, Ethiopia's export share of African as well as world exports is still too little. To make matters worse, it has long been declining/losing market shares incessantly notably until the recent recovery. Indeed, UN's COMTRADE trade statistics indicate that it had declined sharply from 0.042% in 1973 to 0.021% in 1983 and to a historic low share of 0.004% in 1992. Yet, it showed an improvement only recently to 0.023% in 2014, albeit not strong enough to regain its 1970s stand. Similarly, Ethiopia's share of Africa's exports has been very tiny and declining over time. For instance, the share which has been 0.11 per cent in 1980 declined continuously and reached a very small proportion of 0.05 per cent in 2010. Besides its lower global export share which stands at an average of 0.01% during 1995-2014, the relatively small size of the country's export is also reflected by a lower export to GDP ratio of 7.2% and per capita export earnings of only $32.7, which is one of the lowest in the world. In contrast, the comparative figure for SSA is 32.5% and $467 during the same year, respectively. In addition, exports finance less than one fourth of imports (only 24.2 per cent of total imports) in 2012.

of trade and exchange rate reforms undertaken over the past two decades on export performance[2]. Rather, it emphasizes on decomposing the sources of the rapidity of the country's export over the past two decades (1995-2014).

Methodologically, a model which has been widely applied in the trade literature and relevant to decomposing the sources of export growth is the constant market shares (CMS) model. According to the constant market shares model tradition, a country's exports may succeed (fail) to grow as rapidly as the world average for three reasons; (1) Exports may be concentrated in commodities for which demand is growing relatively rapidly (slowly); (2) Exports may be going to relatively growing (stagnant) regions; or (3) The country in question may have been capable (incapable) to compete effectively with other sources of supply (Leamer and Stern, 1970). Since the traditional model is criticized for some drawbacks, this study employs a refined version of the traditional CMS analysis which particularly overcomes its major methodological flaws of application, especially the "order-problem" and the "index number problem."

The CMS model is particularly important to quantify the contributions of a focus country's export structure (commodity and market composition) and competitiveness to its export performance. Indeed, though the CMS model doesn't explicitly take into account demand and supply side factors as in formal econometric analysis, the components of the model implicitly capture important supply and demand side developments. The competitiveness component possibly reflects the role of supply side factors and internal developments affecting the relative prices of the country's exports. Likewise, the country's export orientation(commodity composition and market distribution) and the world trade components of the model likely accounts the role played by demand side factors including foreign income, policy-induced trade barriers in partners and the likes. Thus, the CMS analysis, despite an accounting technique, attempts to consider the role of vital internal and external developments in Ethiopia's export growth.

The relative importance of internal as well as external developments in the growth of Ethiopia's exports has not been assessed so far. Unlike the earlier literature on African

[2] Among the many vital reforms adopted were the trade and exchange rate reforms designed to boost the growth of the external sector and better integrate the country into the global economy. Since 1991/92, Ethiopia's trade sector has seen a major shift from a highly protectionist and inward-looking trade policy to an open and outward-oriented export strategy. Over the course of time, perhaps under the auspices of the two sibling Bretton Woods institutions, WB and IMF, trade restrictions were eliminated, the exchange rate market was liberalized and the country's currency(birr) has seen a major devaluation of about 142% in 1992. The major reforms prescribed to open up its economy (liberalize its trade policy) include dismantling quantitative restrictions and tariffication (replacing non-tariff barriers with their tariff equivalents), gradual reduction of import tariff rates and export taxes and reduction of the tariff dispersion (Bigsten *et al*., 2009; Alemayehu, 2011).

trade which primarily focused on explaining the causes of failure of the region's exports (see Amjadi and Yeats, 1995; Rodrik, 1998; Limao and Venables, 1999; Ng and Yeats, 2002), this study rather emphasizes on the sources of rapid growth of exports in the recent past relying on country level data from Ethiopia. Using product level and market destinations export data during the period 1995-2014, the extent to which the patterns of commodity and market specialization of Ethiopia's exports and their competitiveness have affected its export performance is examined. It particularly seeks an answer to the question: To what extent do factor determinants-growth in world exports, commodity composition, market distribution and competitiveness of exports-affect Ethiopia's export growth?

2. Literature review

Following the constant market shares tradition, differences in export performance among countries is often attributed to differences in their export structures and competitiveness. If a country specializes predominantly in products and importing regions for which demand is growing slowly relative to other products and markets, the country in question is likely to encounter a poorer growth in its exports. The method of constant market shares (hereafter CMS) analysis formulated by Leamer and Stern (1970) and Richardson (1971) allows isolating the effects on export performance of the structure of a given country's exports-commodity composition and market distribution- and its competitiveness, which is particularly attributed to the change in a country's export market shares. In general, this method allows to discerning the extent to which a country's export orientation and competitiveness is favourable or not.

The CMS analysis has been widely applied in studies of export performance of different countries and found to be empirically successful in explaining the underlying sources of success/failure of export growth. In the context of developing countries, the model in its traditional formulation has been applied on India's, South Africa's and Pakistan's export data, among others (see Mahmood and Akhtar, 1996; Edwards and Lawrence, 2006; Veeramani, 2007; Singh, 2014). These studies find that depending on the composition and orientation of exports of each country and also based on the evolution of their global export shares, the source of success/failure of exports has been somewhat different. For instance, Veeramani's (2007) and Singh's(2014) studies show that India's success in exporting over the past two decades has been driven principally by a combination of growth in world trade and improved relative competitiveness of the country's exports. On the other hand, Edwards and Lawrence (2006) indicates that the underlying cause for the failure (declining market shares) of South African exports over the period 1985-2000 was due mainly to the commodity mix of its exports-dependence on primary commodities.

However, as the aforementioned studies decomposition depends entirely on the 'traditional' CMS model, which is argued to suffer from methodological problems such as the 'order-problem' and the 'index number problem', the results of these studies might be biased(a detailed account of the shortcomings of the model is offered in section 3.2). Moreover, the CMS results are likely to vary based on the level of commodity and market aggregations. It is also sensitive to the choice of period of analysis and standard of comparison used to decompose export growth (Richardson, 1971). The modified version suggested by Milana (1986) and Ahmedi-Esfahani and Anderson(2006), which is viewed to overcome some of the problems of application, decomposes changes in export performance/shares mainly into world trade effect, product effect, market effect, competitiveness effect, and an additional mixed/interaction effect.

Variants of the refined model has been employed by Simonis (2000) on Belgian data who find that the market orientation of the country's exports was not favorable to the growth of exports which is ascribed to the fact that its exports was concentrated in the European Union's markets where growth has been evidently below the world average. In addition, Cabral and Esteves (2006) also used on Portuguese data who report that the decline in export performance of the country was due to the deterioration in the relative competitiveness of its exports and the concentration of its exports in slowly growing products.

Despite the subtle variations in the decomposition method, the existing CMS studies conducted in the context of various countries show that what a country exports - commodity composition, where it exports-market distribution - and external competitiveness matters for export growth (see Mahmood and Akhtar, 1996; Simonis, 2000; Cabral and Esteves, 2006; Edwards and Lawrence, 2006; Veeramani, 2007; Singh, 2014). Yet, this technique has not been widely applied recently in the context of commodity dependent LDCs (see Banerji, 1974 for LDCs and Naya, 1964 for Asian developing countries). It is often alleged that primary exporters encounter a sluggish growth and inferior export performance relative to manufactures and other non-primary goods exporters. For Ethiopia is one of commodity dependent LDCs, the CMS analysis is instrumental in evaluating the notion that high dependence on primary commodities retards the expansion of the country's exports. Moreover, our study is the first of its kind as Ethiopia's export performance has not been approached using a detailed data and refined technique of analysis. Once the underlying causes for the success (failure) of the country's exports are explicitly identified, the analysis would be helpful in informing policy makers about the preferred distribution of the country's exports such as to concentrating in commodities and markets that are rapidly growing.

3. Methodology of research and the data

3.1. The basic constant market shares model

The method of CMS analysis is based on decomposition of an identity. In order to assess the relative export performance of a country, we take the ratio of total exports of the focus country to those of a standard usually the world exports. The basic CMS identity is given by:

$$s = \frac{q}{Q} \tag{1}$$

Where q and Q are the total exports of the focus country and the world, respectively; and s is the export share of the focus country. Total exports of the focus country aggregated over all products and destinations can be given by:

$$q^t = \sum_i \sum_j q^t_{ij} = \sum_i \sum_j \left(\frac{q^t_{ij}}{Q^t_{ij}} \right) Q^t_{ij} = \sum_i \sum_j s^t_{ij} Q^t_{ij} \tag{1a}$$

Where $s^t_{ij} \equiv \frac{q^t_{ij}}{Q^t_{ij}}$, qij and Qij denote the focus country's and world exports of commodity i to region j, respectively; i and j denote the ith commodity class and jth destination, respectively; and the superscript t denotes time.

Differentiating and expanding (1a), the basic CMS decomposition can be written as:

$$\frac{dq}{dt} = s^t \frac{dQ}{dt} + \left[\sum_i s^t_i \frac{dQ_i}{dt} - s^t \frac{dQ}{dt} \right] + \left[\sum_i \sum_j s^t_{ij} \frac{dQ_{ij}}{dt} - \sum_i s^t_i \frac{dQ_i}{dt} \right] + \sum_i \sum_j \frac{ds_{ij}}{dt} Q^t_{ij} \tag{2}$$

World Growth Effect | Commodity Effect | Market Effect | Competitiveness Effect

Alternatively, a second decomposition is also possible if the market effect is decomposed first:

$$\frac{dq}{dt} = s^t \frac{dQ}{dt} + \left[\sum_j s^t_j \frac{dQ_j}{dt} - s^t \frac{dQ}{dt} \right] + \left[\sum_i \sum_j s^t_{ij} \frac{dQ_{ij}}{dt} - \sum_j s^t_j \frac{dQ_j}{dt} \right] + \sum_i \sum_j \frac{ds_{ij}}{dt} Q^t_{ij} \tag{3}$$

World Growth Effect | Market Effect | Commodity Effect | Competitive Effect

Where:

$$Q^t \equiv \sum_i \sum_j Q^t{}_{ij}\ ,\ s^t{}_i \equiv \frac{\sum_j q^t{}_{ij}}{\sum_j Q^t{}_{ij}}\ ,\ Q_i^t \equiv \sum_j Q_{ij}^t \quad s^t{}_j \equiv \frac{\sum_i q^t{}_{ij}}{\sum_i Q^t{}_{ij}}\ ,\ Q_j^t \equiv \sum_i Q_{ij}^t$$

In identities (2) and (3), change in total exports (or export growth) is decomposed into four components. World growth effect reflects the growth in the country's exports that would have been realized if it had maintained its share of world exports. The commodity (market) effect measures the extent to which growth is attributed to the concentration of the focus country's exports in relatively high-growing commodities (regions). That is, it represents whether the country specializes in commodities (regions) with growth rates more favorable than the world average. The commodity (market) effect would be positive if the country had concentrated its exports in products (markets) that were experiencing relatively rapid growth than the world average and vice versa.

If a country specializes in products and markets for which world demand is growing rapidly, the market share of the country in question is expected to rise. The first three effects reflect export growth in the hypothesis that the focus country was able to maintain its share of the market. On the other hand, the competitive effect accounts for total export growth which took place due to changes in export shares. Accordingly, an enhanced competitiveness or a positive competitiveness effect entails that the country has experienced a rise in export shares and vice versa.

3.2. Shortcomings of the CMS analysis

The CMS analysis, in its traditional formulation, has been subject to a number of criticisms. The major problems of application identified are the sensitivity of the CMS results to variations in the degree of commodity and market aggregation, the order of composition of the commodity and market effects, the choices of the standard area(countries) to which the focus country's export performance is compared and choice of base weights(Richardson, 1971). It has been tested that the CMS results are quite sensitive to these problems. Of all these shortcomings, three stands out: the order of decomposition of the commodity and market effects - the so-called "order problem", choice of the base weights - the so-called "index number problem", and changes in the level of commodity aggregation. Now I will turn to a brief, but basic, discussion of the first two shortcomings that are found affecting the CMS results significantly. The method employed in this study to address these problems is offered in the subsequent section.

Since the CMS analysis essentially uses discrete-time observations, identity (2), which refers to continuous-time changes, should be translated into its discrete-time formulation. The problem, however, is that there is no uniformity in translating the continuous-time to discrete-time formulation (Richardson, 1971). The discrete time version of identity (2) can be rewritten as;

$$\Delta q = s^t \Delta Q + \left(\sum_i s_i^t \Delta Q_i - s^t \Delta Q \right) + \left(\sum_i \sum_j s_{ij}^t \Delta Q_{ij}^t - \sum_i s_i^t \Delta Q_i \right) + \left(\sum_i \sum_j Q_{ij}^t \Delta s_{ij} \right) \quad (4)$$

In the literature on the CMS analysis, the variation in decomposition lies particularly in the weights applied to each component (see Milana, 1988 for a discussion of the different decomposition techniques employed in different studies). Different weights had been chosen in an attempt to make discrete-time CMS analysis more consistent with its continuous-time version. The lack of consistency in the choice of weights among CMS studies entails that the superscript, t, in identity (4) may refer to both (the beginning and end of the discrete time period). A combination of beginning-and end-period weights has also been used in the literature to calculate the different components of the CMS (Richardson, 1971). This indicates that there is a possibility of making more than one choice of weights. This problem is termed by Milana (1988) as the "index number problem of CMS."

The problem in translating the continuous-time formulation into its discrete-time version is that the latter does not take into account the change in the variables (s_{it} and Q_{it}) at each point of time during the period considered. Between the beginning and end of the discrete time period, however, the export structures of both the focus country and the rest of world are changing continuously (Simonis, 2000). Thus, the fixed weights (s_{it}) often applied in the literature fail to reflect the changes in a focus country's and world exports throughout the period. Using either initial or final year fixed weights, which had been the trend in the previous CMS studies, as noted by Milana (1988), requires one to believe that either the initial-or final-period export structure was dominant throughout the entire period. Empirical evidence also suggests the inappropriateness of applying fixed weights. In this regard, Richardson (1971) demonstrated that the values and signs of the CMS effects were liable to change with the change in the base weights. Apparently, the message is that flexible weights that represent the changes in the country's and world exports need to be employed.

To overcome the index number problem of the CMS analysis, Milana (1988) suggests using a more flexible index numbers. He developed a new formulation of the traditional CMS analysis. Unlike the traditional CMS, the refined decomposition technique

suggests to use the average of the initial and final period weights. Therefore, Milana's (1988) approach is employed in this study.

The other major flaw of the CMS analysis in its traditional formulation is the variability/sensitivity of the results of the commodity and market effects to the change in the order of calculation of the individual effects. That is, the results of the structural effects (commodity and market composition) depend crucially on the order of calculation of the individual components. This is called the 'order-problem' in the CMS literature.

While Leamer and Stern (1970) in their well known CMS analysis admit that the order of decomposition matters, the quantitative variation and sensitivity of individual commodity and market effects to the change in the order of calculation are clearly demonstrated by Richardson (1971). Nevertheless, none of them have proposed a solution to overcome this critical problem. It is argued by Milana (1988) that the 'order problem', is "attributable to the particular decomposition formulas used rather than to a real drawback of the method itself."

In the traditional version of the CMS analysis, which is given by identities (2) and (3), in order to separate the extent to which the market effect could be attributed to the disparity in growth over products or regions, the overall market effect was further decomposed into a commodity effect and a regional effect (Ahmadi-Esfahani and Anderson, 2006). Yet, it is argued that changes in the order of decomposition would result in changes in the magnitudes and sign of the individual commodity and regional/market effects though the sum of both effects would remain unchanged. Depending on which component is calculated first, different measures have been obtained for the individual commodity and market effects in (2) and (3). The definition of the commodity (market) effect in (2) is not the same as in (3). This is illustrated below:

For commodity effect;

$$\left[\sum_i s^t{}_i \frac{dQ_i}{dt} - s^t \frac{dQ}{dt}\right] \neq \left[\sum_i \sum_j s^t{}_{ij} \frac{dQ_{ij}}{dt} - \sum_j s^t{}_j \frac{dQ_j}{dt}\right]$$

and for market effect

$$\left[\sum_i \sum_j s^t{}_{ij} \frac{dQ_{ij}}{dt} - \sum_i s_i{}^t \frac{dQ_i}{dt}\right] \neq \left[\sum_j s^t{}_j \frac{dQ_j}{dt} - s^t \frac{dQ}{dt}\right]$$

The commodity(regional) effect in identity 2 (3) can be interpreted as the difference between the growth in standard exports if growth had been uniform across regions(products), and the growth in standard exports if growth had, in addition, been

uniform across products(regions). This is referred to as the "conditional product (regional) effect." On the other hand, the commodity (regional) effect in identity 3 (2) is interpreted as the discrepancy between the actual growth in standard exports and the hypothetical growth that would have been achieved if growth had been uniform across products (regions)(see Ahmadi-Esfahani and Anderson, 2006 for a detailed discussion of the order-problem and the resulting differences in interpretation).

3.3. A new reformulation of the CMS model and the method of decomposition

Given the aforementioned methodological flaws, it is in the realm of this study to obtain a meaningful and stable CMS results. Thus, the problems of application discussed so far need to be addressed. Based on refined version of the traditional CMS analysis discussed by Ahmadi-Esfahani and Anderson (2006) and by Milana(1988), an alternative reformulation that overcomes the identified pitfalls is employed in this study. The method of decomposition discussed below draws on the works of Ahmadi-Esfahani and Anderson (2006) and Milana(1988).

In order to avoid the order-problem, Ahmadi-Esfahani and Anderson (2006) suggested decomposing the total market effect (or the scale market effect) into three effects: commodity effect, regional effect and interaction effect. The approach starts with a level-one analysis of the basic model where the aggregate export growth of the focus country is decomposed into a scale effect (or structural effect) and a competitive effect. The discrete-time version of the basic model in (1a), which was also given in (4), can be rewritten in a compact form as follows:

$$\Delta q = \underbrace{\sum_i \sum_j s_{ij}^t \Delta Qij}_{\text{Scale Effect}} + \underbrace{\sum_i \sum_j Q_{ij}^t \Delta s_{ij}}_{\text{Competitive Effect}} \qquad (5)$$

The scale effect is the growth in exports that would have been achieved if individual market shares had remained unchanged. Averaging over all markets, the scale effect can be expressed as the sum of the world (aggregate) growth effect and a weighted average of the individual scale market effect:

$$\sum_i \sum_j s_{ij}^t \Delta Qij \equiv \underbrace{s^t \Delta Q}_{\text{World Growth Effect}} + \underbrace{\sum_i \sum_j s_{ij}^t (\Delta Q_{ij} - \Delta Q)}_{\text{Scale Market Effect}} \qquad (6)$$

Following Ahmadi-Esfahani and Anderson (2006), the scale market effect aggregated over the individual markets for all products is decomposed into three effects in the following way:

$$\sum_i \sum_j s_{ij}^t (\Delta Q_{ij} - \Delta Q) \equiv \underbrace{\sum_i \sum_j s_{ij}^t (\Delta Q_{ij} - \Delta Q_j)}_{\text{Commodity Effect}} + \underbrace{\sum_j \sum_i s_{ij}^t (\Delta Q_{ij} - \Delta Q_i)}_{\text{Market(Regional) Effect}} - \underbrace{\sum_i \sum_j s_{ij}^t \left[(\Delta Q_{ij} - \Delta Q_j) - (\Delta Q_i - \Delta Q) \right]}_{\text{Interaction Effect}} \quad (7)$$

The interaction effect captures the combined effect of non-uniformity of growth across product categories and regions (market destinations). The calculation of the commodity and market(regional) effects defined in (7) makes no assumption about the uniformity, or lack thereof, of growth across regions and products and thus are referred to as the "unconditional" commodity and regional effects (Ahmadi-Esfahani and Anderson, 2006). In contrast, the commodity (market) effect given in (2) and (3) are based on a hypothetical assumption that growth is uniform across regions (products). The (scale) interaction effect is given by the difference between the scale market effect and the two conditional effects defined previously in (3) and (2):

SIE = SME – Conditional Market Effect – Conditional Commodity Effect

$$\text{SIE} = \sum_i \sum_j s_{ij}^t \left[(\Delta Q_{ij} - \Delta Q_j) - (\Delta Q_j - \Delta Q) - (\Delta Q_i - \Delta Q) \right]$$

Total export growth of the focus country's exports is thus given by:

$$\Delta q \equiv \underbrace{s^t \Delta Q}_{\text{World Growth Effect}} + \underbrace{\sum_i \sum_j s_{ij}^t \left(\Delta Q_{ij} - \Delta Q_j \right)}_{\text{Commodity Effect}} + \underbrace{\sum_j \sum_i s_{ij}^t \left(\Delta Q_{ij} - \Delta Q_i \right)}_{\text{Market Effect}} +$$

$$\underbrace{\sum_i \sum_j s_{ij}^t \left[\left(\Delta Q_{ij} - \Delta Q_j \right) - \left(\Delta Q_j - \Delta Q \right) - \left(\Delta Q_i - \Delta Q \right) \right]}_{\text{Interaction Effect}} + \underbrace{\sum_i \sum_j Q_{ij}^t \Delta s_{ij}}_{\text{Competitive Effect}} \quad (8)$$

Identity (8), the strategy adopted in this study, allows calculating a third effect explicitly and the individual components of the structural effects are insensitive to the order of decomposition. It should be noted that the interaction effect can also be computed from equation (7). The advantage of using the refined method employed here is that it eliminates the "order problem" - the order of decomposition does not matter for the individual CMS effects.

To resolve the index number problem of the traditional CMS analysis, the approach suggested by Milana(1988), which involves using the average weights of the beginning and end period, is employed in this study. Using developments in index number theory, Milana(1988) discredits employing the CMS analysis in its traditional formulation and

thereby, suggests a new reformulation of the method. Milana's approach overcomes one of the most severe methodological criticisms of the CMS analysis discussed so far, the "index number problem".

In the traditional CMS analysis, fixed weights have been used. On the other hand, the alternative decomposition method employs a representative and flexible weights. Emphasizing the importance of using flexible weights when the weights vary overtime, writes Milana (1988) that 'a decomposition analysis should not use, in general, the fixed share weighted Laspeyres-or Paasche-type indexes when the weights are not constant during the time interval under examination. More "flexible" index numbers should be used instead, paying attention to the particular, dynamics of the elementary components.' Following Milana (1988), the discrete-time decomposition version of identity (8) employed in this study, which uses the average of beginning and end year weights/export shares of the country, is derived as follows:

$$\Delta q \equiv \underbrace{\frac{1}{2}\left(s^0 + s^1\right)\Delta Q}_{\text{World Growth Effect}} + \underbrace{\sum_i \sum_j \frac{1}{2}\left(s_{ij}^0 + s_{ij}^1\right)\left(\Delta Q_{ij} - \Delta Q_j\right)}_{\text{Commodity Effect}} + \underbrace{\sum_j \sum_i \frac{1}{2}\left(s_{ij}^0 + s_{ij}^1\right)\left(\Delta Q_{ij} - \Delta Q_i\right)}_{\text{Market Effect}} +$$

$$\underbrace{\sum_i \sum_j \frac{1}{2}\left(s_{ij}^0 + s_{ij}^1\right)\left[\left(\Delta Q_{ij} - \Delta Q_j\right) - \left(\Delta Q_j - \Delta Q\right) - \left(\Delta Q_i - \Delta Q\right)\right]}_{\text{Interaction Effect}} + \underbrace{\sum_i \sum_j \frac{1}{2}\left[Q_{ij}^0 + Q_{ij}^1\right]\Delta s_{ij}}_{\text{Competitive Effect}} \qquad (9)$$

Identity (9) is a reformulation of the well-known traditional decomposition techniques of Leamer and Stern (1970) and Richardson (1971), except the fact that a third effect, the "interaction effect" is calculated in this study. Moreover, the approach adopted here addresses the major hurdles of the model: the index number problem and the order-problem.

3.4. Data

This study assesses the sources of success (or failure) of Ethiopia's export growth over the period 1995-2014. Quantifying the contribution of each of the CMS components towards export growth requires a detailed export data by products and by destinations. The products considered for analysis were all the exports of the country as defined by the SITC (rev. 3). A homogenous classification of commodities was used, i.e., all commodities are defined at the 1-digit SITC level. Major product categories included along with the one-digit SITC codes in parentheses were as follows:

- Food and live animals(SITC 0)
- Beverages and tobacco(SITC 1)
- Crude materials, inedible, except fuels(SITC 2)

- Mineral fuels and related products(SITC 3)
- Animal and vegetable oils, fats and waxes(SITC 4)
- Chemicals and related products(SITC 5)
- Manufactured products: manufactured goods classified by material(6) and other manufactured/miscellaneous goods(8)(SITC 6 & 8)
- Machinery and transport equipment(SITC 7)
- Commodities and transactions, not specified elsewhere (9).

The destinations of the country's exports are grouped into sixteen geographic regions as follows:
Africa: East Africa, North Africa, Western Africa, Central/middle Africa, Southern Africa;
Developing Asia: South Eastern Asia, Southern Asia, Western Asia, Eastern Asia
Developed America and Developed Asia;
Oceania: Developed Oceania and developing Oceania;
Developing America: central America, Southern America;
Developed America and Europe.
The chosen standard of comparison was total world exports. In order to avoid downward bias in the country's share of exports, this standard does not take into account Ethiopia's own exports. Data on the value of Ethiopia's and world's exports (in current USD) by products and by destinations were obtained from the United Nations, Commodity Trade Statistics (COMTRADE database).

4. Results and discussions: A *constant market shares analysis of Ethiopia's export growth*

This section reports and discusses the results of the decomposition of Ethiopia's export growth using a refined version of the "traditional" CMS model. To take into account all trade partners of Ethiopia including those with negligible shares in the export of goods at the SITC one-digit industry classification, export destinations are categorized into 16 geographic regions. Using data over the period 1995-2014 and refined formulation of the CMS model, Ethiopia's export growth is decomposed into five components.

Table 1. Sources of Ethiopia's export growth, 1995-2014

	Actual change in Ethiopia's exports	World trade effect	Commodity composition effect	Market distribution effect	Interaction effect	Competitiveness effect
Value (thousands USD)	4,015,218.75	2,189,807	-72,319	124,101	-129, 157	1,893,294
Contribution (%)	100	54.53	-1.8	3.09	-3.21	47.15

The result indicates that growth in Ethiopia's exports is driven largely by the growth in world trade. The decomposition result shows that 54.5% of the growth was driven by the rise in world trade during the period 1995-2014. The positive and stronger contribution of world trade effect suggests that growth in world trade has been translated into stronger growth in Ethiopia's exports.

It should be noted that since average export share is used as a weight as opposed to fixed initial year weights for methodological reasons discussed earlier, the increase in world trade does not have its traditional meanings. In the traditional sense, it is interpreted as the hypothetical increase in exports if the country in question was able to maintain its initial share of global exports. Interpreted in this tradition, the hypothetical increment in Ethiopia's exports would have been $1.14 billion which remarkably falls short off the actual increase in exports ($4.015 billion). Perhaps, in spite of the change in the weights applied here, the essential meaning and the implication of the CMS components remain unaltered. Thus, following the traditional model, it can be interpreted that large part of the much remarkable increase in actual exports in excess of the hypothetical increment is attributed primarily to the improved competitiveness of the country's exports and also to some extent to the favourable geographic distribution of the country's exports.

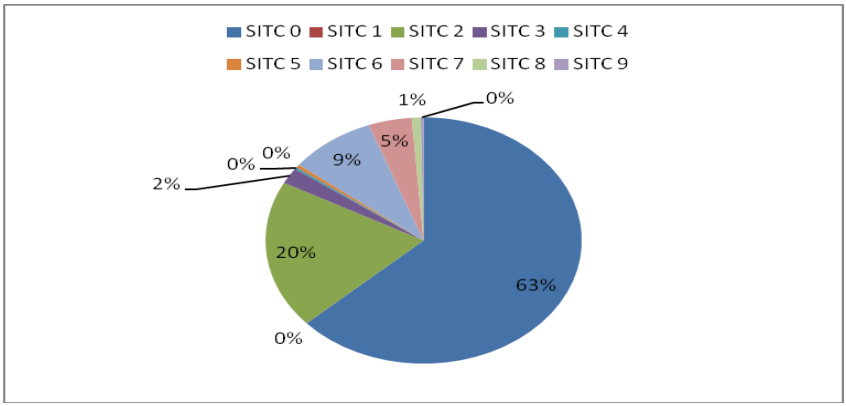
Contributing for 47% of the growth, the leading role played by rising world trade effect is followed by the competitiveness effect. The positive and significant contribution of the competitiveness effect implies that there has been a rise in the global export share of the country during the period. The improvement in competitiveness clearly reflects the improvement in the global standing of the country in 2014 as compared to the one in 1995. Indeed, had Ethiopia only maintained its 1995 share of global exports, the hypothetical increment in export earnings would have been only $1.14 billion in 2014. The hypothetical increment in export revenues are remarkably less than the actual incremental figures of $4.015 billion owing to the fact that the country's share of world exports has increased in 2014 as compared to the value in 1995. In other words, had Ethiopia failed to improve its global export share of 1995, which stood at a meagre 0.008%, the country would have lost an estimated export revenue of $2.45 billion. However, a different picture emerges if one takes the country's share in the 1970s as a reference point. In fact, had Ethiopia maintained its share of world exports in 1973, which stood at 0.042%; its exports would have reached $7.9 billion in 2014. As a consequence of its failure in maintaining its global share of exports in 1973, Ethiopia has lost estimated export revenue of more than $3.5 billion - a figure equivalent to 6.38% of its current GDP.

To the extent that the competitiveness effect is viewed to capture price and non-price factors, the improvement in the competiveness of the country's exports can be taken as a sign of the positive impact of the trade reforms and devaluation in exchange rates

undertaken since 1992 and the subsequent improvement in the supply capacity of the country. Perhaps, for a country that used to practice a protectionist trade policy, it is likely that the measures undertaken in the external trade sector including the reduction of the anti-export bias policies, the reduction in tariffs and the major devaluations and the reforms in the foreign exchange market have enhanced the relative competitiveness of the country's exports.

To the extent that it reflects the enhanced supply capacity of the country, it is encouraging to see improvements in the relative competitiveness of the country's exports over time. Nevertheless, further progress in the competitiveness of the sector still calls for overcoming bottlenecks in the business and regulatory environment that leads, among other things, to increment in the cost of exporting and consequently to a slowdown in the price competitiveness of the country's exports. Indeed, the latest World Bank's global *Doing Business* report, which ranks Ethiopia 146 out of 189 countries, indicates that the business environment in Ethiopia is difficult relative to comparator economies in Africa such as Rwanda, Uganda, Kenya and Egypt (see World Bank, 2016).

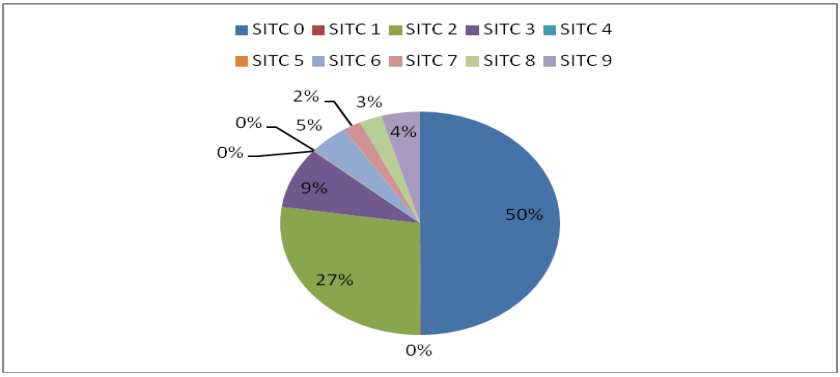
Figure 1. Composition of Ethiopia's exports, 1995 and 2014
Panel a: Composition of exports, 1995



Despite smaller in magnitude at -1.8%, the negative commodity composition effect shows that the commodity mix of the country's exports has been retarding the expansion of exports. Not surprisingly, this is a reflection of the concentration of the country's exports in non-fuel agricultural/primary commodities that grew at below world

average rates. In fact, the composition of the country's exports remains unchanged during the past two decades—exports are dominantly agricultural.

Panel b: Composition of exports, 2014



Even worse, a noticeable feature in this period has been the deepening of primary commodity dependence as indicated by the rise in the share of SITC 0+1+2+3+4 and a consequent decline in the share of manufactured exports (see Figure 1).

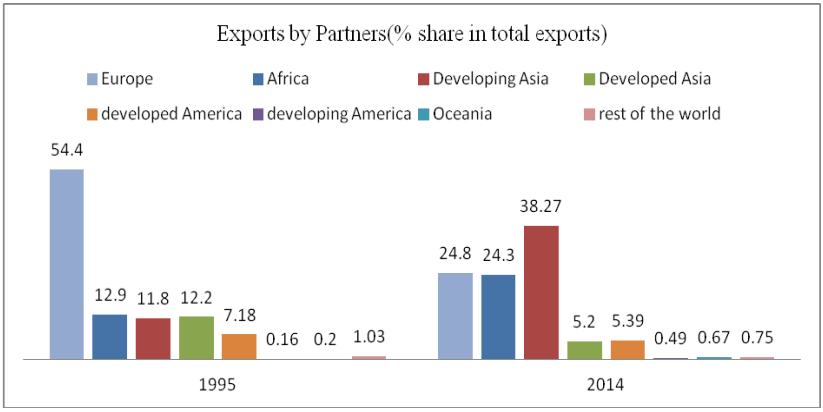
Negative commodity composition effect has also been found earlier for LDCs by Banerji (1974), albeit the magnitude has been remarkably larger as compared to the size we find in this study. Similar effect has also been found in the context of other developing countries such as Pakistan by Mahmood and Akhtar (1996) and also recently in one of emerging countries, India, by Veeramani (2007) and by Singh (2014). In fact, the commodity problem is not unique to Ethiopia alone. It has also been acute for most SSA countries that failed to change the structure of their exports into more dynamic products. In the literature on African trade, commodity dependence has often been blamed for the declining position of African countries in world trade (e.g., UNCTAD, 2003; ECA, 2005; Mold and Prizzon, 2008) and is viewed as the root cause of Africa's trade and finance problem(Alemayehu, 2002).

In fact, Africa's trade problem as remarked graphically by Mold and Prizzon (2008, pp.13) is that 'it is trading the wrong kind of products: primary commodities with low valued added, low prices and a very low elasticity of demand on world markets.' It seems true for Ethiopia too. The unpleasant impact of the existing commodity content of Ethiopia's exports on growth is likely to emanate from the low price and income elasticises of demand for the country's exports in their destination. The negative commodity composition effect is in line with the notion that the commodity content of a

country's exports matters for export growth and economic performance. Indeed, it has long been argued that primary commodities and other resource-based low productivity goods are growth retarding and hence, undesirable. On the other hand, exporting technologically sophisticated or high productivity goods, notably manufactures, is good for export (and also economic) growth and is thus preferable (see Prebisch, 1950; Singer, 1950; Hausmann, Hwang and Rodrik, 2005; Lederman and Maloney, 2012).

On the other hand, at slightly above 3%, the geographic distribution of the country's exports has been another source of the rising exports of the country. Over the past two decades, the country has attempted to diversify the destination of its exports from the one dominated heavily by the developed countries to alternative destinations in the developing world. As indicated in Figure 2, the past attempts of market diversification and the consequent shift in the top destination of the country's exports to countries in the developing world has contributed to the growth of exports. The market distribution effect, albeit less informative in directly estimating the importance of individual components for export growth, it does reflect the positive role of factors affecting foreign market access, such as partners income and trade policies. Thus, the positive market distribution effect appears to reflect the encouraging impact of the recent shift in the partner of the country's exports from its traditional partners to the rapidly growing regions of Asia and Africa. The contribution of the interaction effect, which is intended to capture the non-uniformity in growth across products and destinations, shows that the unfavourable impact of the commodity composition of the country's exports dominates.

Figure 2. Ethiopia's exports by partners, 1995 and 2014



Source: own calculations based on COMTRADE data

5. Conclusions

Ethiopia's exports grew by 951.6% between 1995 and 2014. In other words, the country has seen more than 10-fold increment in its exports (in current USD) from its 1995 value of $421.9 million to $4.4 billion in 2014. For a landlocked country depending much on primary products and with little success in export diversification, the growth recorded over the past two decades is no mean feat. In this study we assessed the sources of Ethiopia's rapid export growth during the post-reform period of 1995-2014. Using the CMS decomposition technique, the contributions towards export growth of world trade growth, commodity composition, market distribution and competitiveness of the country's exports were assessed. In order to address some of the major limitations of the CMS analysis, we employed a refined version of the model. The advantage of employing the refined model is that it overcomes the "order problem" and the "index number problem" of the model in its traditional formulation. The model was applied on SITC (revision 3) one-digit product level data and sixteen regional groupings of destinations of the country's exports.

A constant market shares analysis of Ethiopia's export performance reveals the importance of two key factors as drivers of growth: the growth in total world trade and improvements in Ethiopian competitiveness. Ethiopia's export growth has been driven principally by the growth in world trade. The leading role played by rising world trade effect is a reflection of the fact that the country has been sharing from the expansion of global trade during the past two decades. Thus, regardless of the structure of its exports, Ethiopia has been benefited much from the expansion of global trade over the past two decades and growth in world demand has been generally good to the growth of the country's exports.

Large part of the relative success in exporting over the past two decades is attributed primarily to the favourable growth in world demand. This has been accompanied by the robust contribution of improved competitiveness of the country's exports. The enhanced competitiveness of the country's exports is indicative of the usefulness and broader success of the trade and exchange rate reforms implemented since 1992 and overall improvements in the domestic supply capacity of the country. Perhaps, the positive competitiveness effect is a sign that judicious domestic policy reforms have the capacity to pay off in terms of additional export growth through enhancing the relative external competitiveness of the country's exports. To make the recent export growth sustainable and to spur further expansion in exports, undertaking further measures that enhance the competitiveness of its exports appear to be advantageous. In this regard, besides judicious exchange rate devaluation, measures targeting at improving the business and regulatory environment including the shortening of border and customs delays and efficiency in port usage and other measures aimed at the reduction of the

cost of exporting from Ethiopia such as improving the quality of domestic transport infrastructure and reducing the cost of documentary compliance will further enhance the competitiveness of the country's exports.

The geographic distribution of the country's exports has contributed positively to the growth in exports over the past two decades. The favourable contribution of the market distribution of exports reveals that the country's exports have been concentrated in rapidly growing regions. Moreover, a striking feature is that the shift in the pattern of the country's exports from the developed world to developing regions has been favourable to the growth of its exports. Thus, further efforts to diversify the geographic destinations of exports are likely to accelerate the growth of the country's exports.

Amidst the rising global demand for primary commodities including the commodity price boom of the 2002-2008, the analysis shows that the concentration of the country's exports in primary commodities has slowed down the expansion of the country's exports. Notwithstanding its minimal unfavourable contribution, the negative commodity composition effect seems to be the outcome of the unchanging structure of the country's exports, and concentration of exports in slowly growing non-fuel primary goods - products whose demand has been growing below the world average. While the negative commodity composition effect does not strictly imply for diversification away from primary/agricultural commodity dependence, given that growth in primary goods has been below the world average, diversification into new products—products that are commensurate with the country's comparative advantage - will be advantageous for the further expansion of the country's exports. Perhaps, pursuing a diversification strategy, notably promoting less dependence on primary exports, will be generally good for the further growth of the export sector.

References

African Development Bank Group (2000). Ethiopia: Structural Adjustment Programme. Project Performance Evaluation Report, Abidjan: Operations Evaluation Department, African Development Bank.

Ahmadi-Esfahani, F. and Anderson, G.M. (2006). Constant Market Shares Analysis: Uses, Limitations, and Prospects. Contributed Paper presented at the 43rd Annual Conference of the Australian Agricultural and Resource Economics Society.. s.l.:s.n.

Alemayehu, G., (2002). Finance and Trade in Africa: Macroeconomic Response in the World Economy Context. Hounddmills: Palgrave Macmillan.

Alemayehu, G. (2011). Readings on the Ethiopian Economy. Addis Ababa, Ethiopia: Addis Ababa University Press.

Amjadi, A. and Yeats, A. (1995). Have Trasnport Costs Contibuted to the Relative Decline of Sub-Saharan African Exports? Some Preliminary Evidemce. Policy Research Working Paper 1559: the World Bank.

Banerji, R. (1974). The Export Performance of Less Developed Countries: A Constant Market Shares Analysis. Weltwirtschaftliches Archiv, Vol. 110(1974), pp. 447-481.

Bigsten, A.; Collier, P.; Dercon, S.; Fafchamps, M.; Gauthier, B.; Gunning, W.J. et al. (2002). Do African Manufacturing Firms Learn from Exporting? Center for the Study of African Economies, Working Paper 2002/09. Oxford: University of Oxford.

Bigsten, A., Gebreeyesus, M. and Soderbom, M. (2009). Gradual Trade Liberalization and Firm Performance in Ethiopia. CSAE WPS/2009-21. Oxford: University of Oxford.

Brenton, P. and Newfarmer, R. (2007). Watching More than the Discovery Channel: Export Cycles and Diversification in Development. Policy Research Working Paper 4302. Washington, D.C.: The World Bank.

Cabral, S. and Esteves, P. (2006). Portuguese ExporMarket Shares: An Analysis by Selected Geographical and Product Markets. Economic Bulletin. s.l.:Economic Research Department, Banco de Portugal.

Dollar, D. and Kraay, A. (2001). Trade, Growth, and Poverty. (mimeo). Washington, DC: World Bank.

Economic Commision for Africa (2005). Our Common Interest. Addis Ababa: United Nations.

Edwards, L. and Lawrence, R.Z. (2006). South African Trade Policy Matters: Trade Performance and Trade Policy. Working Papers 12760. Cambridge: National Bureau of Economic Research.

Easterly, W. and Reshef, A. (2010). African Export Successes: Surprises, Stylized Facts, and Explanations. Working Paper No. 16597. Cambridge, Mas: NBER .

Fugazza, M. (2004). Export Performance and its Determinants: Supply and Demand Constraints. Policy Issues in International Trade and Commodities. Newyork and Geneva: UNCTAD .

Ghiorgis, T., (1992). Highlights on the State of Ethiopia's External Trade and its Growth Implication. In the Ethiopian Economy: Structural Problems and Policy Issues: Proceedings of the the First Annual Conference on Ethiopian Economy, ed.. Addis Ababa, Addis Ababa University Printing Press.

Hausmann, R., Hwang, J. and Rodrik, D. (2005). What You Export Matters. NBER Working Paper Series, Working Paper No.11905. Cambridge: National Bureau of Economic Research.

Leamer, E. and Stern, R. (1970). Quantitative International Economics. Boston: Allen and Bacon.

Lederman, D. and Maloney, W.F. (2012). Does What You Export Matters? In Search of Empirical Guidance for Industrial Policies. Washington, D.C.: The World Bank.

Limao, N. and Venables, A. (1999). Infrastructure, Geographical Disadvantage and Transport Costs. Policy Research Working Paper 2257. Washington, D.C.: The World Bank.

Mahmood, A. and Akhtar, N. (1996). The Export Growth of Pakistan: A Decomposition Analysis. The Pakistan Development Review, 35(Winter 1996), pp. 693-702.

Mengistae, T. and Patillo, C. (2002). Export Orientation and Productivity in Sub-Saharan Africa. IMF Working Paper 02/89. Washington, D.C.: International Monetary Fund.

Milana, C. (1988). Constant-Market-Shares-Analysis and Index Number Theory. European Journal of Political Economy, Vol. 4(No.4), pp. 453-478.

Mold, A. and Prizzon, A. (2008). Explaining Africa's Recent Export performance and the Limited Gains from the Commodity Boom. memeo.

Naya, S. (1967). The Commodity Pattern and Export Pattern of Developing Asian Countries to the Developed Areas. Economic Development and Cultural Change, Vol. 40(4), pp. 420-437.

Ng, F. and Yeats, A. (2002). What Can Africa Expect From Its Traditional Exports? Africa Region Working Paper Series, No. 26.

Prebisch, R. (1950). The Economic Development of Latin America and its Principal Problems. New York: United Nations Economic Commision for Latin America.

Redding, S. and Venables, A. (2003). South-East Asian Export Performance: External Market Access and Internal Supply Capacity. Journal of the Japanese and International Economies, Vol. 17(2003), pp. 404-431.

Redding, S. and Venables, A. (2004). Geography and Export Performance: External Market Access and Internal Supply Capacity. In: R. Baldwin & L. Winters, eds. Challenges to Globalization; Analayzing the Economics. Chicago: University of Chicago Press, pp. 95-130.

Richardson, J. (1971). Some Sensitivity Tests for a "constant-market-shares" analysis of Export Growth. The Review of Economics and Statistics, Vol. 53(Aug., 1971), pp. 300-304.

Rodrik, D. (1998). Trade Policy and Economic Performance in Sub-Saharan Africa. Working Paper 6562. National Bureau of Economic Research: Cambridge, Mas.

Samen, S., (2010). A Primer on Export Diversification: Key Concepts, Theoretical Underpinnings and Empirical Evidence. Washington, D.C.: Growth and Crisis Unit, the World Bank Institute.

Simonis, D. (2000). Belgium's Export Performance. Working Paper 2, Federal Planning Bureau. Brussels, Belgium.

Singer, H.W. (1950). The Distribution of Gains between Investing and Borrowing Countries. The American Economic Review, Vol. 40(2), pp. 473-485.

Singh, K. (2014). A Constant Market Share Analysis of India's Export Performance. Foreign Trade Review, 49(2), pp. 141-161.

UNCTAD, (2003). Economic Development in Africa: Trade performance and Commodity Dependence. Geneva: United Nations.

Veeramani, C., (2007). Sources of India's Export Growth in Pre- and Post-Reform Periods. Economic and Political Weekly, XLII(25), pp. 2419-2427.

World Bank (2016). Doing Business 2016: Measuring Regulatory Quality and Efficiency. Washington, D.C.: The World Bank.