Primary agricultural commodity trade and labour market outcomes

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Abstract:

This paper explores empirically the effect of economic openness on labour market outcomes by focusing on the role of agricultural primary commodity exports and imports. Using cross-country data from 1991 to 2009 on commodity trade, employment, unemployment, and several controls, and dealing with endogeneity and measurement-error problems through instrumental variables technique, the findings suggest that trade of goods is associated with low unemployment rate and high employment rate. More importantly, high agricultural primary commodity exports to imports ratio mitigates these labour market benefits provided by trade. These results are robust to different indicators of unemployment variables and the structure of the data. The commodity-based industrialization should be encouraged to reduce the high and challenging young unemployment rate in African countries. By providing economies of scale and larger market, regional integration is undoubtedly a solution to boost diversification in African countries. Education should target long term development needs through appropriate technology acquisition, research and development, and improvement and implementation of traditional existing knowledge.

Keywords: Agriculture, primary commodity, trade, employment, unemployment, instrumental variables technique

JL classification: C36, E24, F16, O13, Q17

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Aknowledgements:

1. Introduction

The relationship between trade openness and labour market, especially unemployment is an important growing question in the economic literature, and the results obtained by researchers are quite ambiguous. For opponents to globalization, lower production costs and fewer regulations in other countries allow foreign firms to out-compete domestic producers. And then, this results in less domestic output and fewer domestic jobs (Davidson et al., 1999; Janiak, 2007). However, for proponents to economic openness, trade expands export markets, occasioning a large demand for domestic products, and therefore increases domestic production, and creates more jobs (Felbermayr et al., 2011). For some authors the relationship depends on other factors such as labourforce skills or labour market institutions (Helpman & Itskhoki, 2010; Moore & Ranjan, 2005).

Besides to this great importance given to the link between trade openness and unemployment, the role played by different components of trade remains less investigated. These components may have different effects. Imports of inputs for domestic production are likely to create jobs whereas imports of final consumption goods may destroy them. Inversely, exports of manufactured products are probably good for jobs while exports of primary commodities are synonym of loss of potential jobs that would be created if these commodities were transformed. Therefore, for a given amount of trade, countries with different trade components do not have to expect the same employment consequence.

Unlike industrial countries and some developing ones, an important structural characteristic of Africa and other least developed countries is the large share of raw commodities in their exports and the difficulty they face to transform their primary commodities. As recognized by the ECA's Economic report on Africa 2013, African countries have a real opportunity to promote economic transformation and unemployment by capitalizing on their resource endowments through engagement in value addition and commodity-based industrialization (UNECA, 2013). In 1980–2010, the share of manufacturing in aggregate output declined from more than 12 per cent to around 11 per cent in Africa, while it remained at more than 31 per cent in East Asia (UNECA, 2013).

This paper investigates empirically the role of primary agricultural commodity exports in the relationship linking labour market outcomes and trade. Using aggregate cross-country data and panel data structures, relevant control variables, and different instrumental variable techniques, the results show that a high ratio of primary agricultural exports to its imports mitigates the unemployment rate reduction (employment rate increase) effect of total trade. The results obtained are robust to the data structure, other unemployment variables as well as the estimation techniques used.

These results suggest that the reduction of the share of primary commodity in their exports is an important recommendation for policy makers to improve labour market outcomes and promote inclusive growth.

The rest of the paper is organized in six sections. Section 2 reviews the literature on the association between trade openness and unemployment. In this section theoretical and empirical works linking the two issues are analysed. Section 3 develops the arguments according to which the non-transformation of agricultural primary commodity before exporting them is a waste of potential job creation and source of unemployment. In section 4, we empirically investigate through econometric models, the effects of primary agricultural commodity exports to imports ratio on labour market outcomes. It also provides an overview of the data and variables used. Section 5 presents empirical results and the robustness checks. Finally, conclusion, discussions and recommendations are at the core of the last section.

2. Trade and unemployment: a literature review

There is a growing literature that investigates the effect of trade volume and composition on employment and unemployment. Theoretical works on this issue are relatively recent and are generally based on existing trade and unemployment models and theories. Two categories emerge from these works regarding their foundations, and the results obtained are far from consensus even within categories.

The first category of these models builds on comparative advantage and trade specialization due to differences in technologies, factor endowment or labor market structure, and takes into account unemployment variable (Davidson et al., 1999; Dutt et al. 2009; Moore & Ranjan, 2005). In this regard, Dutt et al. (2009) show that under the ricardian comparative advantage framework, trade openness reduces unemployment rate since it increases the value of the marginal product of labor in the export sector and therefore complete specialization in this sector. This leads to more investment in job search and the posting of jobs. However, under the Heckscher–Ohlin based comparative advantage the impact of trade depends on the capital intensity of the country. Unemployment rates increase in capital abundant countries and decrease in labour abundant ones as consequence of trade openness since it implies an increase in the relative price of the capital-intensive good. In the same vein, Davidson et al. (1999) use a simple general equilibrium model of international trade that includes an equilibrium rate of unemployment to examine whether trade creates net job opportunities. Using the structure of the labor market as determinant of comparative advantage, they find that trade between a small country and a capital-abundant large country with a relatively more efficient search technology increases the aggregate unemployment rate in the large country. Moore & Ranjan (2005) investigate the static and dynamic effects of globalization on unemployment across skill classes using a model of search unemployment in the style of Pissarides (2000), and skilled and unskilled workers as factor endowment. They find that globalization reduces unemployment in the skilled sector but increases it in the unskilled sector.

The second group of models on this issue merges the intra-industry trade models and equilibrium unemployment models (Chao & Yu, 1997; Driffill & van der Ploeg, 1995; Felbermayr et al., 2011; Helpman & Itskhoki, 2010; Janiak, 2007; Matusz, 1996). The recent

ones generally combine Melitz (2003) model and that of Pissarides (2000). In fact, through the introduction of the equilibrium unemployment model of Pissarides (2000) into Melitz (2003) trade model, Felbermayr et al. (2011) show that trade liberalization lowers unemployment, raises real wages, and improves average productivity. Similarly, Janiak (2007) merges the Melitz (2003) trade model of intra-industry reallocations with the large firm unemployment model from Pissarides (2000) and do comparative statics on the level of employment. He finds that higher trade exposure is associated with a lower level of employment, suggesting that trade generates more job destruction than creation. Helpman & Itskhoki (2010) investigate how the links between trade and unemployment depend on labour market rigidities through a two-country, two-sector model of international trade in which one sector produces homogeneous products and the other produces differentiated products. They showed that the opening to trade raises a country's rate of unemployment if its relative labour market frictions in the differentiated sector are low, and it reduces the rate of unemployment if its relative labour market frictions in the differentiated sector are high. Moreover, lower labour market frictions do not ensure lower unemployment, and unemployment and welfare can both rise in response to falling labour market frictions and falling trade costs.

The effect of trade volume and composition on employment and unemployment has also been largely studied empirically. Base on Leontief (1936), the first works on the issue use factor composition technique to assess the employment content of trade. The unemployment consequence of trade is considered to be the difference between the number of jobs created by export and potential jobs lost due to imports (Driver et al., 1988; Baldwin, 1994; Wood, 1991, 1995). An important paper by Baldwin (1994) reviews some of these studies. It points out a recent OECD study that analyzes the relative importance of various structural factors in explaining employment changes in several member countries during the 1970s and early 1980s. Using input-output techniques to decompose changes in employment by industry in nine OECD countries, namely, Australia, Canada, Denmark, France, Germany, Japan, the Netherlands, the United Kingdom, and the United States, the study shows that trade (exports minus imports) positively impacts employment in most cases considered. However, for trade in the particular case of manufactured goods, the net impact is negative for Canada, France, the United Kingdom and the United States. In the same vein, Driver et al. (1988) calculate the effects of a balanced 100 million pound increase in UK exports and imports of manufactured goods on employment per unit of output under three different assumptions. Regarding trade with developing countries, when they assume that employment changes are calculated using average labor coefficients, there is a net employment loss of 1314 jobs. The net job losses are 1445 when the industry labor coefficients based on the least productive workers producing one-quarter of the industry's output are used. The net job losses reach 5227 when the industry labour coefficients based on the least productive workers producing one-quarter of the industry's output are utilized to measure the import displacement. But labour coefficients based on the most productive workers producing one-quarter of the industry's output are used to measure the employment generated by exports under this assumption. With regard to trade with other European Commission countries, there is a loss of 3514 jobs under the third set of assumptions, whereas 223 jobs are lost when average labor coefficients are utilized.

Wood (1991, 1995) criticizes the methodology used in previous papers, and argues that trade of manufactured goods between developed and developing countries are noncompeting since they are not produced in the importing country. It is thus incorrect to use the labor coefficients of the developed countries to estimate the employment that would be created in these countries if they produced their imported manufactures. He constructed a set of counterfactual labor coefficients by using the actual average labor and capital coefficients used in producing the South's exports of noncompeting manufactures. He found that the employment content of imports of manufactures by the North from developing countries surpasses that of exports by the North to the developing countries by about 12 per cent of employment in Northern manufacturing.

Recent empirical works linking trade and unemployment generally use econometric techniques.[2] While some of them utilize country industry level dataset, [Feliciano (2001) and Revenga (1997) for Mexico, Greenaway et al. (1999) for the United Kingdom, Davidson & Matusz (2005) for the United States, Lang (1998) for New Zealand, Jenkins (2004) for Vietnam], others are aggregate country or cross-country studies [(Dutt et al., 2009; Kim, 2010)]. They generally find ambiguous results. For firm level studies, Greenaway et al. (1999), Revenga (1997) and Lang (1998) find that international trade increases unemployment rate, while Davidson & Matusz (2005) and Jenkins (2004) show that trade openness reduces unemployment, and Feliciano (2001) do not find any statistically significant effect. Regarding aggregate country studies, in their paper, Dutt et al. (2009) find a negative link between international trade and unemployment across countries. However, for Kim (2010) this effect depends on the country's labour market institutions. He analyses the direct effect of international trade on aggregate unemployment and the role played by labour market institutions in this relationship using a cross-country panel data of 20 OECD countries from the 1960s to the 2000s. He finds that trade is likely to lead to an increase (decrease) in aggregate unemployment in countries with relatively rigid (flexible) labour market institution.

3. Primary commodities transformation and unemployment

The discrepancy in the results of the studies linking trade and job market may be partly explained by the composition of the product exported or imported. Unlike final products, export of input (such as primary commodity) is likely to reduce potential job creation whereas its import can be considered as source of employment creation. At least three arguments can be put forward to support the positive association between primary commodity exports and unemployment. Firstly, the transformation process of the raw products itself can be considered as additional activities in the economy. The processing will therefore create supplementary jobs and reduce unemployment rate. Secondly, the production of raw commodity as well as other products may be expanded. In fact, the resource-based

[2] Few empirical works on the topic use equilibrium general calculable technique (an example is Felbermayr, 2011).

industrialization may reduce the world wide supply of primary commodity, and the prices may go up encouraging more employment in this sector. Porto (2008) estimates the impacts of world agricultural trade liberalization on wages, employment and unemployment in Argentina, a country with positive net agricultural exports and high unemployment rates. He finds that a 10 percent increase in the price of agricultural exports would cause an increase in the Argentina employment probability of 1.36 percentage points, a decline in the unemployment probability of 0.75 percentage points, and an increase in labor market participation of 0.61 percentage points. This effect is reinforced by the reduction in resource dependence, the avoidance of resource curse, and Dutch disease because of resource-based industrialization, and ensuring employment stability. Moreover, the improved investments in infrastructure, the production of goods and services required by processing factories are potential sources of job creation (Cramer, 1999). Thirdly, the processing will likely increase private income and public resources through additional value and taxes, and thus encourage investment in human capital, easing its integration into job market.

4. Econometric framework

4.1. Methodology

Econometric model:

The aim of this study is to examine the effect of trade, and especially that of primary agricultural commodity, on unemployment and employment. The empirical model is thus based on existing works linking trade and labour market outcomes. More precisely, the econometric model is borrowed from the ricardian specification of Dutt et al. (2009). It consists of a model linking unemployment and trade outcomes, taking into account potential labour market determinants. Labour market laws and institutions, and macroeconomic variables are introduced as controls. The baseline econometric model assessing the effect of the trade of goods can be written as follows:

$$Unemploy_i = \alpha Trade_i + X_i'\beta + \varepsilon_i \quad (1)$$

Where $Unemploy_i$ is the unemployment rate of country *i*. *Trade* represents the total exports plus total imports as percentage of GDP whereas *X* is the matrix of control variables commonly used in the literature and ε is the error term. The coefficient of interest α is expected to be negative (α <0).

To assess the role played by agricultural primary commodity trade, its export to import ratio interacted with total trade is introduced as additional variable. The following equation is thus obtained:

$$Unemploy_i = \alpha Trade_i + \gamma Trade_i \times Agriprim_i + \varphi Agriprim_i + X_i'\beta + \varepsilon_i \quad (2)$$

Where *Agriprim* is the agricultural primary commodity exports to imports ratio (*Export/Imports*), and *Trade×Agriprim* represents its interaction with total trade. γ is expected to be positive (γ>0).

Estimation strategy:

The estimation of these equations by the ordinary Least Squares method (OLS) suffers from at least two potential problems as recognized by Dutt et al. (2009).

First, the omission of variables affecting both labour market and agricultural primary commodity export is probable. In fact, countries implementing relevant unemployment policies and institutions are also those likely to export more goods or to transform their products before exporting them. All these policies are difficult to be taken into account and their omission could produce biased estimates.

Secondly, unemployment rate may affect trade, causing a reverse causality problem. Indeed, "*countries that exhibit higher unemployment may face populist pressures (domestically) to raise trade barriers*" (Dutt et al., 2009, p. 39). This in turn could affect the export of primary commodity and bias the coefficients α and γ.

To address these issues, we use instrumental variable method, more precisely the Two Stages Least Squares (2SLS) technique is implemented. The total trade and the primary commodity variables are instrumented by the two instruments suggested by Frankel and Romer (1999) and Rose (2004). On the one hand Frankel and Romer regress bilateral trade flows, as percentage of GDP, on measures of country size, distance between the trade partners, and other geographical variables, and then construct a predicted aggregate trade share for each country based on the coefficients obtained. This constructed trade share is then used as an instrument for trade variable. We constructed this instrument for each trade variable. On the other hand Rose (2004) used a remoteness index as a weighted average of a country's trading partners' GDP where the weights are distance to the trading partners. We replicate the construction of these instruments with data taken from CEPII. The percentage of arable land and the landlocked dummy are also introduced as additional instruments. Countries with more arable land are likely to produce more agricultural products and export them, and direct effect of arable land availability on unemployment (not channeled by agricultural employment) is not plausible. The quality of these instruments is tested by accurate statistics.

4.2. Data and variables

To investigate the relationship linking labour market outcomes and primary commodity trade, we collected data from different sources. According to their availability, the 1990-2000 average is used for the cross-sectional analysis (1990-2009 for the panel data analysis). 61 developed and developing countries compose the baseline regression (See Table A1 in the Appendices for the list of the countries).

Dependent variable

The main dependent variable of the empirical exercise is the unemployment rate, defined as the share of the labor force that is without work but available for and seeking employment. Employment rate, referring to the proportion of a country's population that is employed, is also used as dependent variable. Data for these indicators are taken from the International Finance Statistics, as the unemployment data used by Dutt et al. (2009).

Variable of interest

The explanatory variables of interest of the study are the total trade and its interaction with the primary agricultural commodity exports to imports ratio. We follow the Standard International Trade Classification revision 2. In this classification, the first five categories are considered as primary commodities (Fearon, 2005). We keep those of these primary commodities related to agricultural sector (agricultural materials), abandoning the oil and mineral ones. Thus, this variable contains food and live animals, beverages and tobacco, crude materials, inedible, except fuels, and animal and vegetable oils and fats (SITC 0+1+2-27-28+4). These data are taken from the United Nations dataset COMTRADE. Figure 1 presents the correlation between Agricultural Primary Commodity and Labour Market outcomes. Unemployment rate and primary agricultural commodity exports to imports ratio appear to be positively correlated.

Controls

As controls, the first group of variables included is the employment law and institutions. Indeed, as argued by Botero et al. (2004) and Dutt et al. (2009), there is a complex system of laws and institutions in every country aiming to protect the interests of workers. These laws and institutions generally defend individual work contract and provide bargaining power for the adoption of collective agreements. The index of employment law proposed by Botero et al. (2004) is used in this paper. It captures the rigidity of alternative employment contracts, the cost of increasing hours worked, the cost of firing workers, and the difficulty of dismissal procedures. The labour market institution indicator used in this paper is another index of Botero et al. (2004) measuring the power of labour unions. The two indicators are only available for 1997.

The second group of controls is constituted of macroeconomic characteristics. To control for the size of the economy, the logarithmic form of gross domestic product (GDP) and the working age population (population in the age 15-64) are included in the equation. The combination of these two variables captures the effect of GDP per capita which is an indicator for the country’s development level. These indicators are taken from the World Bank World Development Indicator online data (WDI). The Black Market Premium on the exchange rate is also taken into account as independent variable to capture macroeconomic distortions. Taken from the Economic Freedom of the World Project, Fraser Institute, it measures the percentage difference between official and black market exchange rate.

Some labour market indicators are introduced as third category of indicators. They include the share of workers operating in the agricultural sector and the labour participation rate both from the World Bank World Development Indicator online data (WDI). An increase in agricultural employment not only improves overall employment and unemployment rates, but also increases agricultural production and exports. Similarly, high labour force participation affects both the amount of agricultural production available for exports and the unemployment rate. The omission of these variables may produce bias estimate of the coefficients α and γ.

Table A2 in the Appendices summarizes the characteristics and sources of the indicators used in the paper.

5. Results

This section is devoted to the results obtained through the empirical investigations. The objective is to assess whether the non-transformation of commodities before exporting them destroys potential jobs and increases unemployment rate. It is subdivided into three subsections. First, the results of the effect of the trade of goods on unemployment rate are presented. Then, the effect is extended through the exploration of the role of agricultural primary commodity exports to imports ratio. Finally, the robustness of the results is checked with alternative labour market outcomes, total primary commodity indicator, and panel data structure.

5.1. Primary agricultural commodity and unemployment

Table 1 presents the results of the effect of the total exports of goods on unemployment rate obtained through 2SLS estimation method (equation 1). The first column shows the first stage estimation results. The exports variable is instrumented the two instruments suggested by Frankel and Romer (1999) and Rose (2004), and the landlocked dummy used by Dutt et al. (2009). Globally, the instruments have statistically significant coefficients relating them to the export indicator. Moreover, the partial R^2 and the Fisher test confirm the validity of the instrumental variables. Column (2) provides the results of the second stage estimation. The Hansen over-identification statistic p-value of 0.18 underlines the exclusion quality of the instruments. It appears that the coefficient of trade is negative and statistically significant at 1 percent level, suggesting that trade improves unemployment rate. More precisely, 10 percentage points increase in trade volume as percentage of GDP decrease the unemployment rate by 0.07 percentage points. The results obtained are similar to those of Dutt et al. (2009).

Regarding the controls, they have similar signs as those found in the literature (see Dutt et al. 2009). The labour union increases unemployment while the working age population and the labour participation rate improve labour market outcomes.

[Insert table 1 here]

5.2. Role of agricultural primary commodity trade

We showed that the trade of goods could be considered as an important predictor of unemployment. This subsection extends previous finding by investigating the role played by the agricultural primary commodity exports and imports in this relationship. To this end, the interaction of total goods trade with agricultural primary commodity exports to imports ratio is included as additional variable (equation 2). Total trade, agricultural primary commodity exports to imports ratio, and their interaction are considered as endogenous and thus instrumented by our trade instruments. The results are summarized in Table 2. Columns (1), (2), and (3) present the first stage estimation results respectively for total exports, agricultural primary commodity exports, and their interaction term. The instruments are significantly related to the trade indicators. Besides, the partial R^2 ranging from 0.23 to 0.56, and the Fisher test confirm the relevance of the instrumental variables. Column (4) shows the 2SLS results. The Hansen over-identification statistic of 0.43 at the bottom of the column highlights the exclusion quality of the instruments. As in previous results, total trade of goods reduce unemployment rate. However, the coefficient of the interaction term is positive and statistically significant as expected, suggesting that the size of the unemployment improvement effect depends on the primary agricultural commodity exports to imports ratio. More explicitly, to fully benefit from the advantages of goods exports in terms of unemployment rate improvement, exporting countries should transform a large share of their agricultural products before exporting them.

[Insert table 2 here]

5.3. Robustness to different type of labour market outcomes

The previous subsection showed that the transformation of agricultural products before exporting them is associated with the improvement of unemployment rate. To see whether these results are robust to the choice of labour market outcomes, and to assess the extent to which employment is affected, youth unemployment, long term unemployment, and employment rates indicators are used as dependent variables. Table 3 presents the results obtained from this exercise. Columns (1) and (2) show the results when the employment rate is used as dependent variable. It is found that the trade of goods increase employment, and similarly to unemployment rate, this effect depends on the proportion of primary agricultural commodity in the trade. For a country having as primary commodity exports to imports ratio the sample average (1.628), 1 percentage point increase in total trade will increase the employment rate by 0.053 (**0.081-0.017*1.628**) percentage point, while it will increase employment rate for the country with the minimum ratio (0.064) by 0.08 (**0.081-**

0.017*0.064), and decrease the employment rate for the country with the maximum ratio (8.741) by 0.067 (**0.081-0.017*8.741**).

In columns (3) and (4) the youth unemployment rate indicator taken from the World Bank World Development Indicator is used. As for the overall unemployment rate, the trade of goods reduce youth unemployment rate, but this effect is alleviated by the primary agricultural commodity exports and imports ratio. For a country having as exports to imports ratio of primary commodity the minimum of the sample used in the study (0.064), an increase of 1 percentage point in the trade of goods as percentage of GDP reduced youth unemployment rate by 0.132 percentage point (**-0.134+0.028*0.064**). However, for a country with the maximum primary commodity exports to imports ratio (8.741), the same increase in the trade of good will increase youth unemployment by 0.11 percentage point (**-0.134+0.028*8.741**). For a country having the sample average primary agricultural commodity exports to imports ratio (1.628), youth unemployment rate will be reduced by 0.088 percentage point (**-0.134+0.028*1.628**).

Regarding Column (5) and (6) in which the dependent variable is the long term unemployment rate, it is found that the trade of goods decreases unemployment, and similarly to the overall and youth unemployment rate, this effect depends on the ratio of primary agricultural commodity exports to imports ratio.

[Insert table 3 here]

5.4. Robustness with the total Primary commodity exports

This subsection extends previous ones by using total primary commodity exports to imports ratio instead of agricultural commodity exports to imports ratio. It consists of the estimation of Equation 2 with the 2SLS method, and the results obtained are detailed in Table 4. The columns (1), (2), (3), and (4) present the situations when unemployment, employment, youth unemployment, and long term unemployment rates are respectively used as dependent variables. For all types of labour market outcomes used, the coefficients of total trade and those of its interaction with total primary commodity exports to imports ratio are statistically and significantly different from zero as expected, except for column (4). More precisely, the total trade of goods decreases unemployment and increase employment, but the extent of this effect depends on the primary commodity exports to imports ratio, confirming previous results.

[Insert table 4 here]

5.5. Robustness to the data structure: estimation with panel data

The next objective of this paper is to examine how changes in the total trade and the primary agricultural commodity composition of trade within a country affect the unemployment rate. Even though unemployment rates are subject to business cycle fluctuations and the structure

of exportation tends to be very stable over time, the exercise provides at least a partial view of the robustness of the results using within-country variation. The panel data structure also allows us to capture the short-run effect and compare it to the cross countries results. It also takes into account the country-specific effects. The data sources are the same as before, but because of the availability of data we do not include all the controls.[3] We control for GDP, labour participation rate, working age population, and agricultural employment. The panel specification also includes the lagged unemployment rate as regressor to take into account the hysteresis effect. Three-year periods average data are used from 1990 to 2010, and the following dynamic specification is estimated:

$$Unemploy_{it} = \mu Unemploy_{it-2} + \alpha Trade_{it} + \gamma Trade_{it} \times Agriprim_{it} + \varphi Agriprim_{it} + X_{it}'\beta + \varepsilon_{it} \quad (3)$$

Where $Unemploy_{it-2}$ is the two-period lagged of unemployment rate.

The within-estimates of Equation (3) are likely to be inconsistent, since the transformed lagged dependent variable is likely to be correlated with the transformed error term. This correlation vanishes when the number of time periods gets large, which is not the case in our situation. We thus used the generalized method of moments (GMM) procedure to generate consistent estimates of the parameters of interest. This allows the elimination of the country-specific effects and the instrumentation of the lagged dependent variable and the variable of interest by their appropriate lagged. Two specification tests check the validity of the instruments. The first is the standard Hansen test of over-identifying restrictions. The second test examines the hypothesis that there is no second-order serial correlation in the first-difference residuals. The paper uses the two-step robust System-GMM estimator with the correction for finite sample bias. The results obtained are summarized in Table 5 for overall unemployment rate (columns (1) and (2)), youth unemployment rate (columns (3) and (4)), long term unemployment rate ((columns (5) and (6)), and employment rate (columns (7) and (8)).

[Insert table 5 here]

The Hansen over-identification test p-value ranging from 0.147 to 0.849 highlight the validity of the instruments used. Regarding the variables of interest, these results are similar to those from the cross countries regression. Total exports decrease unemployment depending on the agricultural primary commodity exports to imports ratio. The coefficient of the lagged youth unemployment variable is not statistically significant meaning the non-existence of the hysteresis effect in the sample considered.

[3] The size of the sample is thus increased.

6. Concluding remarks

The impact of trade openness on labour market outcomes has been largely assessed theoretically and empirically in economic literature. Scholars generally found different findings, and leave policy makers without consensual results. This paper extends the empirical side of this relation by arguing that the effect depends on the composition of trade, and by focusing on the role played by agricultural primary commodity exports to imports ratio.

It is found that total exports of goods improve labour market outcomes, but high primary commodity exports to imports ratio alleviates this benefit from trade. The results are robust to the labour market variable used, the data structure, and the total primary commodity variable.

The paper calls for important recommendation for policy makers to improve labour market outcomes and promote inclusive growth. The commodity-based industrialization should be promoted to reduce the high and challenging young unemployment rate. As recognized by the Istanbul Programme of Actions, poor countries should "adopt and strengthen, as appropriate, sector and commodity-specific policies, measures and strategies to enhance productivity and vertical diversification, ensure value-addition and increase value-retention" (United Nations, 2011, paragr. 66b).

But, how to reduce this ratio without affecting the dynamism of the economy? This can be possible through the transformation of raw products before exporting them. In addition to the creation of value addition, this will result in low unemployment rate. In Africa the share of processed goods in the exports remains very low because of the low level of industrialization. One way to solve for this is to abandon the short term views, and target long term policies in the education and financing systems. Education should target long term development needs through appropriate technology acquisition, research and development, and improvement and implementation of traditional existing knowledge. This will enable the production of manufactures and reduce the dependence to primary commodity exports. Another important issue concerns the difficulties faced by Africans to finance their initiatives. Banking systems should be reformed in order to ease the access to credit, and the development of the private sector. Tariff escalation issue also needs to be addressed to encourage the export of processed commodities.

Two issues are generally raised to discourage industrialization in developing countries. The first is the barrier faced by these countries to enter developed countries market and the power of multinational firms dominating international production and marketing chains. In fact, the international quality and sanitary norms required to penetrate the industrialized economy's markets are difficult to be fulfilled by new born industries. Moreover, the competition established by exiting firms and multinationals do not make easy the situation of the new entrants. Furthermore, tariff escalation is often shown to be an obstacle to vertical diversification (Lindland, 1997).

Tariff escalation occurs if tariffs rise with stages of further processing.Escalating tariffs can be considered as additional protection to domestic processing industries since they produce at higher than international costs. Market access to export processed industrial products becomes more difficult.

In order to create a larger market and capture economies of scale in the transformation of primary commodities, regional integration appears as a priority. It enables greater levels of trade and eases diversification. It is also a way for poor countries to compete successfully in the global economy.

Internal factors also increase pessimism about processing commodity in poor countries. Indeed, in these countries the insufficient availability of energy shown by frequent power-cuts and the shortages of key inputs are common, the weak firm organization and the absence or unreliability (because of weak maintenance) of infrastructure are among factors feeding this skeptical view point. In addition, the scarcities in the resources required to succeed with capital-intensive production, the low education level and the lack of technology reinforce these opinions.

Because they are generally more endowed with natural resources, it can be thought that developing countries should keep their advantage in primary commodity productions and exports, and leave the monopoly transformation of the product to industrial countries with higher technologies according to trade theories. But some examples, namely the progress of South-East Asian countries, coupled with the history of contemporaneous developed countries show that relative advantage in manufacture is not static. It is rather a dynamic phenomenon. Poor countries can and should address factors handicapping their structural transformation and develop industries associated with their comparative advantage as determined by their endowment structure (Chandra et al. 2013; Lin & Monga, 2011; Lin, 2012).

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Tables

Table 1: Effect of Trade on Unemployment Rate

	(1) Total Trade (%GDP) (First stage)	(2) Unemployment Rate (2SLS)
Total Trade		-0.007***
		(3.23)
Labor Union	49.396	5.885***
	(0.41)	(2.58)
Employment Law	-96.549	-1.737
	(0.95)	(0.74)
Working Population	-124.292***	-1.661**
	(3.98)	(2.16)
Log GDP	96.351***	0.928
	(3.78)	(1.23)
Labor Participation	0.739	-0.229***
	(0.32)	(3.59)
Black Market Prenium	1.383	0.007
	(1.23)	(0.29)
Frankel and Romer instrument	720.258***	
	(9.19)	
Remoteness	105.262*	
	(1.71)	
Landlock	48.202	
	(0.99)	
Constant	-104.031	41.209***
	(0.14)	(5.25)
Observation	55	55
R^2	0.75	0.26
Partial R^2	0.57	
Fisher Stat P-Value	0.000	
Hansen OID p-value		0.182

Absolute *t* statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Effect of Total Trade on Unemployment Rate: Role of the share of Exports and Imports of Primary agricultural commodity ratio

	(1) Total Trade (%GDP) (First stage)	(2) Primary Commodity (Firststage)	(3) (Trade)x(Primary Commodity) (First stage)	(4) Unemployment Rate (2SLS)
Total Trade				-0.007*
				(1.77)
Agricul. Primary Commodity				-1.894
				(1.29)
(Trade)x(Agricul. Primary Commodity)				0.014*
				(1.66)
Labor Union	-46.822	-1.495	-420.905	10.967***
	(0.32)	(1.34)	(1.11)	(2.86)
Employment Law	-61.542	0.040	-181.487	-0.637
	(0.55)	(0.03)	(0.66)	(0.19)
Working Population	-136.231***	-0.105	-368.080***	4.835
	(3.53)	(0.19)	(3.43)	(1.62)
Log GDP	102.363***	-0.438	208.477**	-4.287*
	(3.28)	(0.83)	(2.39)	(1.75)
Labor Participation	2.222	0.024	5.412	-0.265***
	(0.95)	(0.83)	(0.87)	(3.88)
Black Market Prenium	1.473	-0.025	-4.670	0.017
	(1.13)	(0.70)	(1.55)	(0.48)
Log Agricultural Employ	19.002	-0.422	66.102	-3.403***
	(1.06)	(0.89)	(1.10)	(2.64)
Frankel & Romer instrument (Total trade)	1279.807**	8.262*	411.880	
	(2.20)	(1.85)	(0.35)	
Landlocked	17.990	-1.341***	-324.103***	
	(0.46)	(2.72)	(2.84)	
Frankel & Romer instrument (trade x Agricul. Primary Commodity)	-712.471	-15.252**	-1251.819	
	(0.95)	(2.50)	(0.84)	
Frankel & Romer instrument (Agricul. Primary Commodity)	115.664	2.460***	170.434	
	(1.06)	(2.97)	(0.76)	
Constant	757.240*	10.963***	3940.254***	7.397
	(1.74)	(2.73)	(3.47)	(0.38)
Observation	54	54	54	54
R^2	0.89	0.75	0.74	0.86
Partial R^2	0.56	0.40	0.23	
Fisher Stat P-Value	0.00	0.00	0.00	
Hansen OID p-value				0.430

Absolute *t* statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Effect of Total Trade on Employment, Youth Unemployment and Long term Unemployment Rates: Role of the share of Primary agricultural commodity

	Employment Rate (2SLS)		Youth Unemployment Rate (2SLS)		Long term Unemployment Rate (2SLS)	
	(1)	(2)	(3)	(4)	(5)	(6)
Total trade (%GDP)	0.007**	0.081**	-0.015***	-0.134*	0.055	-0.323**
	(2.43)	(1.97)	(3.26)	(1.89)	(0.57)	(2.24)
Agricul. Primary Commodity		5.448**		-7.904		-21.809**
		(2.07)		(1.63)		(2.15)
(Trade)x(Agricul. Primary Commodity)		-0.017**		0.028*		0.084*
		(1.97)		(1.89)		(1.77)
Labor Union	-6.143*	-2.610	7.700	-1.137	33.971*	35.523**
	(1.81)	(0.33)	(1.23)	(0.07)	(1.95)	(2.14)
Employment Law	-1.148	2.733	2.004	-3.479	-15.838	-4.191
	(0.37)	(0.42)	(0.34)	(0.33)	(0.81)	(0.39)
Working Population	3.547***	8.529**	-0.241	-10.146	11.782	-35.395
	(3.97)	(2.03)	(0.13)	(1.30)	(0.63)	(1.25)
Log GDP	-2.231**	-4.760	-2.127	3.324	-11.622	16.173
	(2.38)	(1.61)	(1.16)	(0.59)	(0.82)	(0.78)
Labor Participation	0.737***	0.523***	-0.435***	0.041	-0.869	-1.387**
	(12.20)	(4.32)	(3.88)	(0.13)	(1.45)	(2.52)
Black Market Prenium	0.006	0.015	-0.006	-0.013	3.179	0.988
	(0.16)	(0.16)	(0.09)	(0.12)	(1.48)	(0.47)
Log Agricultural Employ	1.233**	2.339	-1.147	-0.292	-3.536	-16.222*
	(2.36)	(1.26)	(1.21)	(0.08)	(0.40)	(1.93)
Constant	-29.282***	-96.194**	94.475***	202.354***	53.827	646.479***
	(4.37)	(2.29)	(5.59)	(2.67)	(0.26)	(2.65)
Observation	60	60	57	57	38	38
R_square	0.99	0.98	0.87	0.41	0.86	0.73
Hansen OID p-value	0.93	0.72	0.32	0.90	0.34	0.26

Absolute *t* statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Effect of Export on Unemployment, Youth Unemployment and Employment Rates: Role of the share of Total Primary commodity

	(1) Unemployment Rate (2SLS)	(2) Employment Rate (2SLS)	(3) Youth Unemployment Rate (2SLS)	(4) Long term Unemployment Rate (2SLS)
Total Trade (%GDP)	-0.011***	0.019***	-0.018***	-0.020
	(4.15)	(3.73)	(2.80)	(0.16)
Primary Commodity	-2.301**	2.853***	-2.103	-10.085
	(2.01)	(3.42)	(1.63)	(1.06)
(Trade)x(Primary Commodity)	0.011*	-0.009***	0.008***	0.023
	(1.71)	(3.73)	(2.79)	(0.66)
Labor Union	8.294***	-2.578	-1.624	38.318**
	(2.85)	(0.61)	(0.18)	(2.24)
Employment Law	-4.396	-1.846	0.751	-27.402
	(1.38)	(0.49)	(0.11)	(1.35)
Working Population	3.846*	2.110	1.883	5.224
	(1.82)	(1.63)	(0.88)	(0.35)
Log GDP	-3.988**	-0.692	-4.393**	-7.022
	(2.11)	(0.52)	(2.15)	(0.62)
Labor Participation	-0.271***	0.717***	-0.188	-1.134*
	(3.81)	(9.00)	(0.81)	(1.81)
Black Market Prenium	0.012	-0.184*	0.101	2.448
	(0.11)	(1.65)	(0.49)	(1.27)
Log Agricultural Employ	-3.281***	2.897***	-0.703	-5.019
	(3.51)	(3.08)	(0.38)	(0.49)
Constant	28.166**	-35.104***	82.211***	149.566
	(2.49)	(4.22)	(4.27)	(0.68)
Observation	54	61	58	38
R^2	0.82	0.99	0.77	0.87
Hansen OID p-value	0.56	0.23	0.25	0.46

Absolute *t* statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: GMM estimation of the effect of Export on Unemployment and Youth Unemployment Rates: Role of the share of Total Primary commodity

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Unemployment Rate		Youth Unemployment Rate		Long Term Unemployment Rate		Employment Rate	
	Dynamic panel-data estimation, two-step system GMM							
Lag Dependent Variable	-0.208	0.295	-0.237	0.007	0.531	0.333	-0.217	-0.105
	(0.88)	(0.98)	(0.77)	(0.04)	(1.35)	(1.37)	(0.85)	(1.37)
Total Trade (%GDP)	-0.012*	-0.030***	-0.027*	-0.023**	-0.031*	-0.157***	0.012**	0.008***
	(1.80)	(2.92)	(1.76)	(2.46)	(1.80)	(3.48)	(2.50)	(2.66)
Agricul. Primary Commodity		-1.460		-1.773*		-22.211***		0.450
		(1.15)		(1.83)		(2.61)		(0.99)
(Trade)x(Agricul. Primary Commodity)		0.012*		0.013**		0.072***		-0.007***
		(1.80)		(2.56)		(3.36)		(2.67)
Log Working Population	0.350	0.574	0.727	0.342	0.713	-1.689	0.121	0.535*
	(1.15)	(1.14)	(1.17)	(0.87)	(0.84)	(0.74)	(0.25)	(1.67)
Log GDP	-0.516	0.662	-3.007	-2.629**	-3.374	-6.117**	1.431	1.880***
	(0.86)	(0.37)	(1.21)	(2.29)	(0.79)	(2.55)	(1.22)	(5.13)
Labor Participation	-0.247***	-0.161	-0.539***	-0.042	-0.955	-0.896	0.240	0.369***
	(3.05)	(1.03)	(2.88)	(0.14)	(1.16)	(1.10)	(1.28)	(3.50)
Log Agricultural Employ	-0.853	-1.062	-2.217	-3.917**	-5.323*	-7.565	1.176*	1.495***
	(1.33)	(0.54)	(1.20)	(2.20)	(1.72)	(0.70)	(1.73)	(2.69)
Constant	18.193	-33.236	93.550	75.24***	122.553	399.389***	46.225	-10.292
	(0.73)	(0.54)	(1.27)	(3.15)	(0.98)	(3.36)	(0.79)	(0.43)
Observation	415	346	359	359	214	214	334	334
Number of Countries	75	74	76	76	41	41	71	71
AR(2) p-value	0.954	0.226	0.801	0.257	0.151	0.144	0.939	0.127
Hansen p-value	0.243	0.849	0.392	0.535	0.147	0.762	0.622	0.750
Instrument Number	27	27	27	34	24	32	27	48

Absolute *t* statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 1: Correlation between Agricultural Primary Commodity and Labour Market outcomes

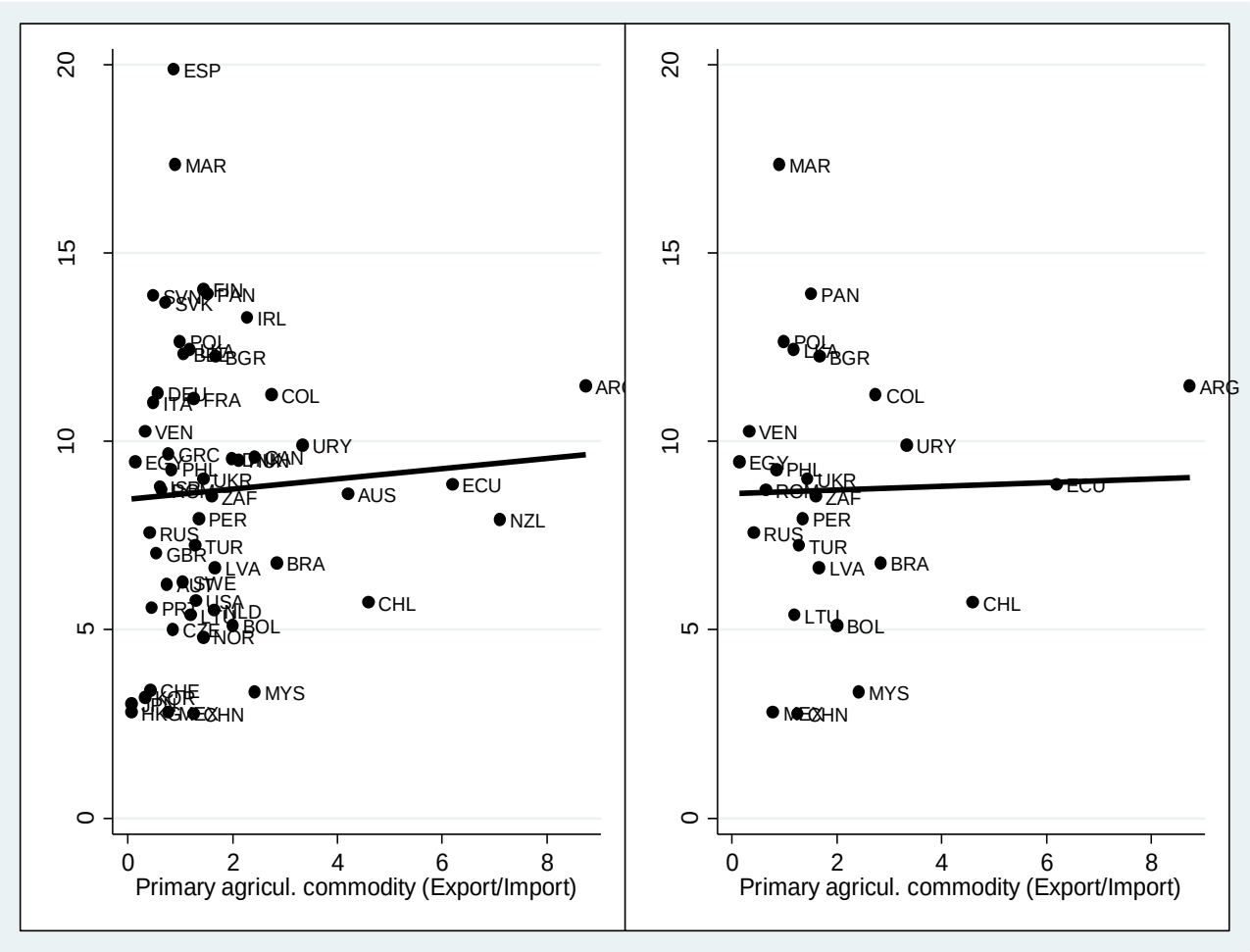

Table A1: Country list for cross-country regression

WB Code	Country Name		WB Code	Country Name
ARG	Argentina		JOR	Jordan
AUS	Australia		JPN	Japan
AUT	Austria		KOR	Korea, Rep.
BEL	Belgium		LKA	Sri Lanka
BGR	Bulgaria		LTU	Lithuania
BOL	Bolivia		LVA	Latvia
BRA	Brazil		MAR	Morocco
CAN	Canada		MEX	Mexico
CHE	Switzerland		MYS	Malaysia
CHL	Chile		NLD	Netherlands
CHN	China		NOR	Norway
COL	Colombia		NZL	New Zealand
CZE	Czech Republic		PAN	Panama
DEU	Germany		PER	Peru
DNK	Denmark		PHL	Philippines
ECU	Ecuador		POL	Poland
EGY	Egypt, Arab Rep.		PRT	Portugal
ESP	Spain		ROM	Romania
FIN	Finland		RUS	Russian Federation
FRA	France		SVK	Slovak Republic
GBR	United Kingdom		SVN	Slovenia
GHA	Ghana		SWE	Sweden
GRC	Greece		TUR	Turkey
HKG	Hong Kong SAR, China		UKR	Ukraine
HRV	Croatia		URY	Uruguay
HUN	Hungary		USA	United States
IDN	Indonesia		VEN	Venezuela, RB
IND	India		ZAF	South Africa
IRL	Ireland		ZMB	Zambia
ISR	Israel		ZWE	Zimbabwe
ITA	Italy			

Table A2: Descriptive Statistics

Variables	Mean	Min.	Max.	Stand. Dev.	Sources
Unemployment rate	8.690	2.76	19.867	3.795	International Finance Statistics (IMF)
Employment rate	53.571	37.54	74.91	7.119	International Finance Statistics (IMF)
Trade	235.382	30.925	1270.393	204.668	UN COMTRADE Database
Agricultural Primary Commodity (Export/Import)	1.628	0.064	8.741	1.634	UN COMTRADE Database
Agricultural land (% Total land)	42.741	3.162	84.971	20.932	WDI
Labor Union	0.486	0.148	0.827	0.187	Botero et al. (2004)
Employment Law	0.458	0	0.7143	0.197	Botero et al. (2004)
Working Age Population	20.965	18.739	25.119	1.421	WDI
GDP (Constant $)	4.33e+11	3.04e+09	8.19e+12	1.20e+12	WDI
Labour Force Participation	68.508	49.058	83.682	6.960	WDI
Black Market Prenium	1.95	0	42	5.820	Fraser Institute
Agricultural Employment	9.061	0.291	40.281	10.073	WDI
Frankel and Romer instrument	0.222	0.039	1.372	0.191	Estimation based on data from CEPII
Remoteness	8.706	8.322	9.485	0.340	Estimation based on data from CEPII
Landlock	0.116	0	1	0.323	CEPII

Note: WDI refers to World Bank World Development Indicator and CEPII stands for CEPII Geography database