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Labour Market Effects of Integration into GVCs: A Perspective from Undertaking International Industrial Transfer

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Abstract

In recent years, the trend of anti-globalization is constantly rising, several major developed economies and emerging market countries to accelerate the implementation of the "beggar" trade discrimination measures on the grounds of employment protection. It is important to clarify the real impact of global value-added chain integration and international manufacturing transfer on different countries' job market. This paper intends to analyse it through theoretical discussion, empirical analysis and policy simulation, and evaluate the policy effect of major national trade restriction measures. First, enrich and develop the early trade strategy of developing countries to achieve economic take-off. On the basis of combing the relationship between trade and employment in the traditional economic theory of development and its influence mechanism, this paper discusses the theoretical basis of the globalization impact on the different employment market. Secondly, on the basis of describing the integration of global value-added chains and the characteristics of global manufacturing transfer, this paper analyses the labour elasticity of all kinds of units in different industries by constructing the econometric model. Finally, to extend the GTAP comparison static computable general equilibrium framework for the recursive dynamic one with the value-added data and labour elasticity, which can scenario and assess the impact of different policies on the job market.

Key words: Global value-added chains; labour market; export-oriented strategy; import substitution strategy

I. Introduction

Integration into global markets for trade and investment is a critical pathway for developing countries to grow and to access productivity-enhancing technologies and knowledge. For many emerging countries, participation in GVCs also plays an important role in the process of structural transformation, contributing to the creation of more productive, higher-quality, and higher-earning jobs. However, reaping the benefits of GVC integration does not come automatically, benefits of GVCs can also vary considerably depending on whether a country operates at the high or at the low end of the value chain. Many previous studies found that the expanding and strengthening a country's GVC participation increases the probability of transitioning to a higher income class and the probability is higher for lower-middle income countries. (Boffa et.al., 2015, WBG)

With GVC-driven development, countries generate growth by moving to higher-value-added tasks and by embedding more technology and know-how in all their agriculture, manufacturing, and services production. GVCs provide countries the opportunity to leapfrog their development process.

(Anabel Gonzalez, WBG, 2016)

Figure 1 Significant relationship between GVC participation and GDP per capita

Source: OECD-WTO TiVA, WDI, WBG.

The growth of global value chains (GVCs) has increased the interconnectedness of economies and led to a growing specialisation in specific activities and stages in value chains, rather than in entire industries. And the participation in GVCs is often characterized by countries specializing in some particular segment of a production process rather than in final products. Empirically, the phenomenon is documented by a rise in trade in intermediates, or "vertical specialization". With the development of vertical specialization and the prevalence of trade in GVCs, the relationship between trade and employment becomes more complicated. Recently, more than 60 per cent of global trade takes place within such GVCs, employing an estimated 16 million people worldwide, the organization of GVCs involves restructuring the activities and location of economic activity, it has fundamental implications for jobs—What they are, where they go and who gets them. (UNCTAD, 2013)

Figure 2 Relationship between GVC participation and employment

Source: OECD-WTO TiVA, WDI, WBG.

Although there is some both theoretical and empirical work on outsourcing/offshoring according to the literatures review, most of the work on the employment effects of integration into GVCs is based on the analyses of case studies. And the traditional theoretical and empirical literature on trade and labour markets did not systematically address the employment effects of integration into value chains, regional or global. This paper intends to analyse it through theoretical discussion, empirical analysis and policy simulation, and evaluate the labour market effects of integration into GVCs and its influence mechanism

II. Literature review

It's undoubtedly that opening helps a country's economic take-off, however, its impact on the labour market in developing countries is indeed uncertain. Especially at the stage that the GVCs integration as the main form of globalization. As much as developing countries are encouraged to move up the value chain, it is important to recognized that this upgradation is likely to be associated with displacement costs. Value-chain upgradation means that a firm either occupies more of the entire value-chain or moves from a lower to a higher segment of the value-chain. In a world of limited resources and binging constraints, either of this world lead to some workers losing their jobs or being made to work excessively, both of which are undesirable outcomes. De Backer (2011) further points out that GVCs and employment is a complex issue because while labour market losses of GVC-integration are visible and concentrated, gains tend to be more hidden and diffused, and there is a small impact on aggregate level of employment, but a larger effect on composition. This said, offshoring leads to lower costs, higher productivity and hence to extra jobs and GVC-integration to international specialisation, which implies and international division of labour.

The simple Heckscher-Ohlin-Samuelson (HOS) prediction of trade resulting in a redistribution of employment away from import substituting and towards export-oriented production is based on the assumption of homogenous firms and products, and inter-industry specialization and trade. However, in the real world, most trade is of the intra-industry type, reflecting trade in intermediates or exchange of differentiated products between countries with very similar factor endowments. Jansen and Turrini (2004) suggest that much of the labour market effects of trade would be intra-industry in nature. In contrast, the HOS prediction of inter-sectoral reallocation is partly driven by

the assumption of homogeneity among producers within the same sector. (Haltiwanger et.al., 2004)

So far, the previous literatures related to the GVCs and labour market effect can be mainly divided into the following three categories:

1. Trade Policy, GVCs and labour market effect

A number of previous studies have shown that trade policy has a significant impact on the labour market. In the simplest versions of the currently prevailing neoclassical model of the economy, long-term levels of employment and unemployment are determined by macroeconomic variables and labour market institutions, not by trade and not at all by trade policy. So, according to this view, trade policy can have no long-term impact on employment levels. However, the more direct empirical evidence, based on panel data, shows that when trade is driven primarily by Ricardian Comparative Advantage, protection increases unemployment rates across countries. And several permanent trade liberalizations reveal a striking difference in the short-term and long-term responsiveness of unemployment to trade liberalization. While the immediate effect of reducing trade barrier trends to be a rise in unemployment. That is, adjustment takes time but at least in this dimension, offers positive returns in the long term. (L.A.Winters, 2014) Furthermore, in the presence of labour market frictions, GVCs can be associated with short-term unemployment for certain types of workers. Reallocation of jobs across and within countries takes time and low-skilled workers, workers with industry-/occupation-specific skills are especially likely to face significant adjustment costs in the short-term. Recent literature has exploited both industry-level (Amiti and Wei, 2005; Crino, 2010) and worker-level data (Liu and Trefler, 2008; Ebenstein et al., 2014) to identify these effects.

Going ahead, policy designed to reduce domestic unemployment via international trade would also need to take the employment effect of GVC-participation into account. (Jiang and Milberg, 2013) Bamber et al. (2013) also suggests that GVC participation generally tends to lead to job creation and to higher employment growth. However, the impact of GVC participation on economic development depends upon the depth of domestic integration into the global economy. In the GVC world, jobs can be created by polices reducing the import content of domestic exports and/or expanding the export content of foreign imports keeping final exports and imports unchanged. However, such policies would need to focus on GVC analysis and industrial upgrading. More attention would also need to be given to sectoral employment composition associated with GVC trade. For some sectors in some countries, trade expansion might be absorbed mainly by foreign labour, whereas for some other sectors trad protection might create more unemployment than domestic employment. Trade policies would thus need to take into account the sectoral variation in GVC participation.

2. The Channels of GVCs' effect on the labour market

GVCs increase aggregate and long-term employment through the reallocation of tasks across and within countries. The impact of GVCs on employment emanates from a complex array of channels. (Görg, 2012). The previous researches makes it clear that the effect of GVC integration on jobs varies by country, by sector, and perhaps most importantly, by the stage of the value chain and thus the nature of activities that take place in the country. In all cases, two main channels maybe available for countries integrated into GVCs to experience employment and wage growth. The first is to deliver continued productivity growth among firms operating in the GVCs to allow for competitiveness and upgrading to higher value-added activities. The second is to capture grater value-added and jobs by extending the reach of the GVC into the local economy, which involves

fostering spillovers from GVC participation and engaging more local firms in the supply network. (D. Taglioni and D. Winkle, 2014)

To begin with, trade in tasks increase the productivity of the offshoring firm leading to an expansion of sales that in turn generates employment. Offshoring also results in firms being able to offer intermediate and final goods at lower prices. Thus employment can grow "through and expansion of activity of other business that can acquire cheaper inputs or through an increase in demand of final consumers that see their real incomes surge" (IMF, 2013). Second, offshoring and outsourcing enhance the productivity and competitiveness of firms within GVCs by providing access to lower cost, differentiated, and better quality inputs. Employment will decline in less competitive sectors but this will be offset by job growth in more competitive parts of the economy. Offshoring has little net effect on domestic employment, while pushing domestic workers toward more complex jobs. (Gianmarco Ottaviano, 2015) That is because job creation associated with the productivity effect is strong enough to offset job destruction associated with the displacement effects, although domestic production stages become less labour intensive. (A. Hijzen and P. Swaim, 2007) A hallmark study suggests that an increase of 1% in offshoring results in a decrease of 0.15% in sectoral employment in manufacturing and 0.08% in service. (OECD, 2007) However, the emergence of GVCs has also led to a global reallocation of jobs, with labour-intensive manufacturing jobs in particular moving from advanced economies to low-wage developing countries, especially in East Asia (World Bank, 2012). Moreover, by redefining the comparative advantage of countries across tasks rather than industries, GVCs also lead to a reallocation of jobs within countries across different occupation (Grossman and Rossi-Hansberg, 2008)

Taglinoi and Winkler (2014) maintain that GVCs can benefit labour markets through three mechanisms: first is domestic effect: GVC participation tends to be characterized by higher demand for skilled labor from MNCs/other GVC participants. While MNCs many temporarily bid away human capital by paying higher wages or offering enhanced employment benefits, this effect tends to get diffused with a rise in the productivity of domestic firms or with market adjustment to tightening labor supply. Secondly, Training effect: local firms participating in GVCs are more likely to receive training from NMCs or their international buyers. Thirdly, labor turnover effect: knowledge embodied in the workforce of participating firms such as MNCs or their local suppliers moves to other local firms.

X. Jiang and W. Milberg (2013) pointed out that the labour content associated with a country's foreign trade is no longer simply of two kinds-domestic labour contained in exports and foreign labour contained in imports. With the participation of GVC trade, a country's exports might contain foreign imports as intermediates, and it imports from foreign countries might also contain its own exports to these countries as intermediates, so the country's trade can be decomposed into five components and there are five categories of employment to consider. In addition to the aforementioned two, we also must include: foreign labour contained in exports; domestic labour contained in imports and third-country labour contained in a country's imports. The first two are the standard impact of final goods and services exports and imports, and the last three are uniquely the result of countries' participation in global supply chains. Each channel produces income and labour demand, domestically or internationally. Exports and the export content of imports generate demand for domestic labour. Imports, the import content of exports and third-party intermediates trade generate demand for foreign labour.

To summarize, in a world with internationalized production processes, there are five distinct

channels through which a country's trade can affect employment globally, and the publication of new databases such as the OECD's TiVA and the 2016ed World Input-Output Database (WIOD) have recently led to the empirical work on this subject, which allow us to calculate all five categories of employment generated by trade over the period 1995-2014 for a panel of countries that cover more than 85 percent of world gross domestic product (GDP).

3. Countries' experience analysis

Recently, with the construction and continuous improvement of the global input-output database, it's possible to analysis the labour market effects of integration into GVCs participation on different sectors. And a review of the case studies shows that GVC-participation can lead to significant employment and income gains.

Jiang and Milberg (2013) use the WIOD to provide estimates of the five categories of employment generated by integration into GVCs over 1995-2009 for a panel of 39 countries that cover 85 percent of world GDP. In 2009, the countries in their panel were found to generate close to 88 million jobs globally through their participation in GVC trade; this accounted for nearly 14 percent of total trade-generated jobs in that year. Gasiorek et al. (2015) also use WIOD data to explore India's integration into GVCs inter alia examining the employment embedded in India's exports to the world and its top five partners. They find value added trade to play a significantly role in India's employment generation with "export jobs" having risen from 37.9mn in 1995 (10% of total employment) to 75.3 mn in 2011 (16% of total employment). Kabeer and Mahmud (2004) document the generation of 1.6 million "new" jobs in Bangladeshi export garment sector; most of the new jobs wen to women employees. Similarly, Nadvi and Thoburn (2004) document a 132 per cent increase in employment in the Vietnamese garment industry during the 1990s. According to Humphrey et al. (2004) estimates, Kenya's export horticulture directly generated employment for close to 100,000 persons. In contrast, import liberalisation created pressures on Vietnamese and South African textile firms, resulting in job losses. For instance, Nadvi and Thoburn (2004) report that Vietnamese textile employment fell by 30 per cent during the 1990s, largely on account of the restructuring of state-owned enterprises that dominate the country's textile industry. Roberts and Thoburn (2004) report a similar fall in employment in South African textile manufacturing in the latter half of the 1990s.

Most researches pointed out that the employment effects of GVC integration are mixed in developing countries, with both winners and losers emerging in the process. Specifically, in most high-income countries, where firms outsource parts of the value chain to third countries, and offshoring will involve the most labour-intensive processes in the value chain. This will obviously result in reduction in employment in the short term. But it also means that the firms doing the offshoring should become more productive, both because the costs for the offshored activities should decline and the productivity of their now more specialized domestic activities should increase. This would, over time, result in growth of the firm and more hiring. So the net, economy-wide effect on employment from offshoring may be neutral or even positive over time. But the composition of employment will change, with demand for manual and routinized activities (lower-skilled) declining and that for non-routinized (higher-skilled) activities increasing, and higher-skilled workers gain in terms of rising wages, but lower-skilled workers experience grater job losses. (S. Becker et. al, 2013) Countries with large surpluses and low wages have seen strong jobs growth following GVC integration, and as sectors and countries upgrade, wages rise but net employment falls, and more skilled workers gain most. Raising labor standards in GVCs appears to be a win-win

proposition overall, with workers benefiting from improved conditions and firms experiencing productivity gains. (Thomas Farole, 2016)

III. Model and methodology

The basic input-output relation of a country is shown as in equation (1):

$$\mathrm{Y} = \mathrm{AY} + \mathrm{F} \quad (1)$$

Where, A is the input-output technical coefficient matrix, Y is a vector of total outputs, and F is the vector of final demands. The equation can be rearranged into an open Leontief model as shown in equation (2):

$$\mathrm{Y} = \ [I - A]^{-1}F \quad (2)$$

When we incorporate trade and employment into the input-output system and we get (3):

$$\mathrm{L} = \hat{E}[I - A]^{-1}X \quad (3)$$

When with the existence of intermediate trade, the country's input-output date contains two separate tables: domestic intermediate basic flow table (Z^D) and imported intermediate basic flow table (Z^M). And the two separate basic flow matrices will allow us to construct two separate input-output coefficient matrices: the domestic (A^D) and imported (A^M), and the sum of these two will be the traditional A matrix.

With the A^M matrix, we are now able to compute the import content of a country's exports in following way:

$$\mathrm{IC} = A^M[I - A]^{-1}X \quad (4)$$

Koopman et al. (2010) propose to measure vertical specialization by dividing IC by the total value directly and indirectly generated by a country's exports. Thus, for Koopman et al. vertical specialization is the share of foreign intermediate inputs value in the total integrated value generated by a country's exports.

When there are three countries in the world, trading in both intermediates and final outputs with each other, and the system of three equations the final demands of the three countries can be expressed in the following way:

$$\begin{bmatrix} I - A^{11} & -A^{12} & -A^{13} \\ -A^{21} & I - A^{22} & -A^{23} \\ -A^{31} & -A^{32} & I - A^{33} \end{bmatrix} \cdot \begin{bmatrix} Y^1 \\ Y^2 \\ Y^3 \end{bmatrix} = \begin{bmatrix} F^1 \\ F^2 \\ F^3 \end{bmatrix} \quad (5)$$

The Global Leontief Inverse Matrix is as follow:

$$L^G_{3m*3m} = \left[\begin{bmatrix} I & 0 & 0 \\ 0 & I & 0 \\ 0 & 0 & I \end{bmatrix} - \begin{bmatrix} A^{11} & A^{12} & A^{13} \\ A^{21} & A^{22} & A^{23} \\ A^{31} & A^{32} & A^{33} \end{bmatrix} \right]^{-1} = \begin{bmatrix} l^{11} & l^{12} & l^{13} \\ l^{21} & l^{22} & l^{23} \\ l^{31} & l^{32} & l^{33} \end{bmatrix}$$

Multiplying the global Leontief inverse matrix by the trade vector $\mathrm{T}_i$will give us the total value generated by home country i's foreign trade globally:

$$\zeta_i = L^g \cdot T_i$$

In order to obtain the five components of the multi-countries trade with the existence of intermediate trades, which are exports and imports of final goods. Import content of exports, export content of imports, and third-country intermediate contents in home country's imports. We construct matrix Θ_i, which is of great importance

because it contains the five components of home country's trade:

$$\Theta_i = \begin{bmatrix} l^{11}t_1 & l^{12}t_2 & l^{13}t_3 \\ l^{21}t_1 & l^{22}t_2 & l^{23}t_3 \\ l^{31}t_1 & l^{32}t_2 & l^{33}t_3 \end{bmatrix}_{(m*m)\cdot(m*1)}, \quad i=1,2,3$$

Take i=2 as the home country, and we have the relationship between the value-added share and the different labor markets effects in the multi-country framework:

Table The relationship between the value-added share and the different labor markets in the multi-country model

Components	Variables	Description	Labor market effects	Domestic labor market effects	Foreign labor market effects
Imports	$l^{11}t_1$	Country 1's final goods exported to home country 2	Import substitution for domestic employment	↓	↑
Imports	$l^{33}t_3$	Country 3 's final goods exported to home country 2			
Exports	$l^{22}t_2$	Home country 2's final goods exported	Employment creation by the domestic exports.	↑	↓
Foreign content of exports	$l^{12}t_2$	Total value generated in country 1 due to home country 2's export	a country's exports generate jobs and incomes in foreign country	↓	↑
Foreign content of exports	$l^{32}t_2$	Total value generated in country 3 due to home country 2's export			
Domestic content of imports	$l^{21}t_1$	Values generated in home country due to country1's export for home country	The country's imports from foreign countries might contain its own export to those foreign countries as intermediate inputs—a country's imports generate jobs domestically	↑	↓
Domestic content of imports	$l^{23}t_3$	Values generated in home country due to country 3's export for home country			
Intermediates contained in imports	$l^{31}t_1$	Values generated in country 3 due to country 1's export for home country 2	Trade between two countries will in turn create jobs in the third country	↓	↑
Intermediates contained in imports	$l^{13}t_3$	Values generated in country 1 due to country 3's production of export for home country 2			

Finally, we could add the employment dimension to the framework. Following the factor-content method introduced before, let $\hat{E}_\tau$ be the diagonal matrix of labor coefficients for country τ, we multiply each partitioned row (m*1) of the Θ_i matrix by the corresponding $\hat{E}_\tau$(m*m) matrix, the Θ_i matrix is transformed into an employment matrix Λ_i of as shown below:

$$\Lambda_i = \begin{bmatrix} \hat{E}_1 l^{11} t_1 & \hat{E}_1 l^{12} t_2 & \hat{E}_1 l^{13} t_3 \\ \hat{E}_2 l^{21} t_1 & \hat{E}_2 l^{22} t_2 & \hat{E}_2 l^{23} t_3 \\ \hat{E}_3 l^{31} t_1 & \hat{E}_3 l^{32} t_2 & \hat{E}_3 l^{33} t_3 \end{bmatrix}$$

Λ_2 is the matrix of employments generated by home country's trade, and the employments generated by the five components of trades are shown in the same order as the five types of values generated in matrix Θ_2.

IV. Data Description

V. Empirical Analysis

VI. Conclusion and policy implications

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