

# Financial Sector Liberalisation and the Climbing of Manufacturing GVCs

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## Abstract

**The National 14th Five-Year Plan and 2035 Vision Outline emphasise the need to promote the integration of China's manufacturing industry and service industry, so as to achieve the upgrading of China's manufacturing industry to the high end of the global value chain. Based on the OCED input-output data and the World Bank STRD data, the study empirically explores the impact of financial sector openness on the upgrading of the manufacturing industry's global value chain by using the global multiregional input-output model and the panel model. The study finds that both the quantity and quality of financial sector openness have a significant effect on the upgrading of manufacturing GVCs, with the quality of financial sector openness having a more pronounced effect, and this conclusion still holds after considering robustness; accordingly, it puts forward policy recommendations for financial sector openness to promote the upgrading of manufacturing GVCs.**

## Keywords

**Financial sector liberalisation, Manufacturing, Global value chain climbing.**

## 1. Introduction and literature review

At present, a new round of scientific and technological revolution and industrial revolution continues to evolve, the international division of labour and trade system continues to deepen, the value-added of the global value chain of manufacturing industry led by developed countries "fragmentation" is increasing, the report of the twentieth CPC National Congress pointed out that our country has to promote the opening up of the world to the outside world at a high level, and to steadily expand the systematic opening up of the rules, regulations, management, standards and other systems. The opening up of the financial industry is an important aspect of the formation of a new pattern of comprehensive opening up; the national "14th Five-Year Plan" and the Outline of Vision 2035 emphasise the need to promote the integration of China's manufacturing industry with the service industry, so as to achieve the upgrading of China's manufacturing industry to the high end of the global value chain.

Academics have proposed the use of technological innovation to promote the status of industrial division of labour and value-added (Jie Zhang and Wenping Zheng, 2017[4]; Xu and Lian et al, 2017[5]). However, the transformation process of the manufacturing industry from the processing and assembly link with lower value added to the link with higher value added such as R&D and design not only requires basic factor inputs such as human capital, but also relies more on the effective integration of innovation resources by domestic and foreign high-end service factors such as finance. At present, China's financial industry, which plays a key role in the allocation of R&D investment and innovation factors, is relatively lagging behind, with a low degree of opening up to the outside world, and even after joining the WTO, the financial

industry is still faced with stringent foreign investment regulations and trade barriers (Sun Puyang et al., 2018[6]), which seriously restricts the technological innovation and transformation and upgrading of enterprises. Against the above background, this paper empirically investigates the impact of financial sector openness on the climb of manufacturing global value chain based on cross-country panel data.

The proposal and development of financial sector opening and manufacturing global value chain climbing have attracted extensive attention from scholars at home and abroad, and have been discussed from different perspectives.

Studies on financial sector openness: Calderón and Schmidt-Hebbel (2008) find that the impact of financial sector openness on output is highly correlated with domestic financial markets, with output volatility declining with rising financial sector openness in countries with more developed domestic financial markets and lower levels of indebtedness; conversely, higher levels of financial sector openness can cause a sharp decline in real output. An empirical analysis by Ma, Yong and Wang, Fang (2018) based on quarterly data from 1998-2015 further confirms that financial volatility shows a significant rise with higher financial openness, while the rise in output volatility is very weak. Zhou Dong et al. (2022) find that financial sector openness significantly increases the propensity to export and export earnings of manufacturing firms, and that financial sector openness-induced exports of Chinese manufacturing firms promote firm employment absorption and firm productivity.

Research on manufacturing GVCs: Yang Huixin et al. (2020), based on the theory of coupling coordination, found that the degree of coupling coordination between technological progress in the manufacturing industry and the upgrading of GVCs is on an upward trend as a whole. Based on the perspective of trade liberalisation, Zhu, Tingjun and Ban, Yuanhao (2020) calculated that the liberalisation of trade in productive services has a negative inhibitory effect on the upgrading of manufacturing GVCs. Xiang Songlin and Tian Rongzhi (2022) measure the level of input digitisation in manufacturing industry with world input-output data, and empirically test the role of input digitisation on the upgrading of manufacturing GVCs in developing countries than in developed countries. Wu Jingwei and Jiang Jing (2021) based on manufacturing industry panel data, research on the impact of industrial openness and integration on manufacturing global value chain upgrading, the results found that industrial openness and integration significantly promote manufacturing global value chain upgrading.

At this stage, most of the studies on the opening of the financial sector and the development of manufacturing global value chain are single impact studies of financial sector development on manufacturing global value chain, Arnold et al. (2008) based on the World Bank's survey data on more than 1,000 enterprises in 10 sub-Saharan African countries found that the opening of the financial services industry significantly promotes the productivity improvement of the manufacturing industry. Sun Zheyuan (2022) analysed the relationship between digital finance, SME development and the climbing of manufacturing GVCs, and the results show that digital finance and SME development can promote the climbing of manufacturing GVCs, and there is a heterogeneous impact.

Taken together, the current research in this area still has the following shortcomings: the existing literature mostly analyses the impact of the opening of the financial sector and the development of manufacturing GVCs on economic and social development, but lacks research on the effect of the development of the financial sector on manufacturing GVCs, and there is a dearth of literature on the mechanism of the opening of the financial sector on the upward movement of manufacturing GVCs. The current literature mostly focuses on China's financial industry and China's manufacturing industry in the global value chain, the international research level needs to be supplemented. Studies on the impact of the two have not reached uniform conclusions, and empirical evidence on the opening up of the financial sector is also

lacking. The current literature is mostly qualitative, and quantitative research needs to be supplemented.

Based on this, this paper establishes an indicator system at the international level according to the connotation of financial sector openness and the climb of manufacturing global value chain and the availability of data, and analyses and discusses the impact effect of financial sector openness based on OCED input-output data and World Bank STRD data; and explores the impact of financial sector openness on the upgrading of the manufacturing industry based on the perspective of global value chain.

## 2. Theoretical models

### 2.1. Baseline modelling

Referring to the existing research results, the following panel model on financial sector openness and manufacturing GVCs is constructed:

$$GVCP_{sit} = \beta_0 + \beta_1 FOL_t + \beta_2 Z_{it} + \eta_i + \mu_i + \xi_{it} \quad (1)$$

In equation (1),  $GVCP_{sit}$  is the index of global value chain position of industry  $i$  in period  $t$ ;  $FOL_t$  is the openness level of the financial industry in period  $t$ ;  $\beta_0$  is a constant term;  $Z_{it}$  is a control variable, which mainly includes foreign direct investment (FDI), the size of the manufacturing industry (SCA), and the level of urbanisation (UR).  $\eta_i$ ,  $\mu_i$ , and  $\xi_{it}$  denote the industry-individual effect, the time effect, and the random error term, respectively.

### 2.2. Selection of variables and description of data

#### 2.2.1. Measurement of the manufacturing global value chain division of labour index

Measurement of manufacturing global value chain division of labour index Drawing on the measurement methods of Wang Zhi et al. (2015), Li Yue and Cai Lihui (2020), based on the Global Multi-Regional Input-Output Model (GMRIO), the index of the division of labour of China's manufacturing global value chain is measured. The specific calculation formula is shown in equation (2):

$$GVC_{it} = \frac{PLV\_GVC_{it}}{PLY\_GVC'_{it}} \quad (2)$$

In equation (2),  $t$  represents the period and  $i$  represents the industry.  $PLV\_GVC$  represents the ratio of domestic value-added to total industry output, which can represent the forward average production length of the industry;  $PLY\_GVC'$  represents the ratio of foreign value-added to total industry output, which can represent the backward average production length of the industry.  $GVC$  represents the index of global value chain division of labour in manufacturing industry, and the bigger the index is, it indicates that the more the industry is at the high end of the global value chain division of labour. The larger the index, the higher the position in the global value chain division of labour, and the opposite is true for the lower end of the chain.

#### 2.2.2. Measurement of financial sector openness indicators

Cross-border activities in the financial services sector have various modes, such as commercial presence and cross-border trade, and there is not yet a relatively uniform method of measurement due to the specificity and complexity of the opening up of the financial sector. We can consider the systematic high-level opening of the financial sector, which refers to the fact that financial opening is no longer just a tinkering with the original quantitative aspects, i.e., it is not the opening up of some specific financial services, but rather a quantitative to qualitative leap, i.e., it is the financial opening up shifting from the quantitative type to the systematic type. This paper adopts the negative list control model and the principle of pre-access national treatment to measure the quality of financial liberalisation (FOQ), and uses a country's cross-border capital flows to assess the quantity of financial liberalisation (FON).

### 2.2.3. Other control variables

In addition to the above variables, in order to ensure that the results do not generate omitted variable errors, further control variables such as the degree of openness to the outside world, foreign direct investment, the size of the manufacturing industry, the level of urbanisation and so on. Each control variable is described as follows: foreign direct investment (FDI), measured by the net fixed assets of foreign enterprises; the scale of manufacturing industry (SCA), measured by the sales value of the manufacturing industry; and the level of urbanisation (UR), expressed as the percentage of the total urban population.

### 2.2.4. Data description

This paper takes China's manufacturing industry from 2012 to 2022 as the research object. The data are mainly obtained from the China Statistical Yearbook, the China Industrial Statistical Yearbook, the China Trade and Foreign Economy Statistical Yearbook, the China Science and Technology Statistical Yearbook, and the data released by the World Bank in previous years. In view of data availability and inconsistency of statistical calibre, the following adjustments are made to the relevant data: taking into account the consolidation of data in China Industrial Statistical Yearbook after 2012, automobile and railway, aerospace and other manufacturing industries are merged and collectively referred to as the transportation equipment manufacturing industry; taking into account that it is difficult to obtain all the data of 31 manufacturing industries published by the National Bureau of Statistics, in order not to affect the accuracy of the study, the industries with more missing data are excluded and finally selected as the manufacturing industries. Considering that it is difficult to obtain all the data of 31 manufacturing industries published by the National Bureau of Statistics, in order not to affect the accuracy of the study, some of the industries with more missing data are excluded, and finally 19 manufacturing industries are selected as the object of the study.

## 3. Empirical results and analyses

### 3.1. Baseline regression

Table 1: Benchmark regression of financial sector openness on the climb of manufacturing GVCs

variant	FON	FOQ
GTI	0.0368	0.0471
FDI	0.0691	0.0553
SCA	0.3991	0.3650
UR	0.0437	0.0296
constant term (math.)	5.313	6.094
time effect	YES	YES
R2	0.674	0.622
sample size	100	100
F	13.112	19.016

The regression results of the quantity and quality indicators of financial sector openness are shown in Table 1. Overall, the two basic indicators of financial sector openness have a positive effect on the upgrading of manufacturing GVCs, i.e., the higher the level of financial sector openness, the more it can promote the upgrading of the status of China's manufacturing GVCs.

Among them, the regression coefficient of the quantity of financial sector openness is 0.0368, and the result passes the significance test at the level of 0.1. The regression coefficient of the quality of financial sector opening is 0.0471, and the result also passes the significance test at the 0.1 level. It is easy to see that the regression coefficient of the quality of financial sector opening is significantly larger compared to the quantity of financial sector opening. It can be seen that the quality of financial sector openness has a more significant role in promoting GVCs. The reason may be that high-quality financial sector opening can better meet the needs of the manufacturing industry and provide it with more precise and professional financial services. For example, deepening reforms in the foreign exchange sector, expanding systematic opening in an orderly manner, continuing to promote the development of the foreign exchange market, and striving to improve the quality of capital account opening will help attract more foreign financial institutions and long-term capital to China. High-quality opening up of the financial sector can provide better financing channels for the manufacturing industry and help it carry out technological upgrading and innovation, thus promoting the upgrading of the manufacturing value chain. As far as the regression results of control variables are concerned, the regression coefficients of FDI are 0.0691 and 0.0553, and they are significant at least at the level of 0.1. The reason for this is that the introduction of FDI can increase the competitiveness of the financial industry and promote the more efficient operation of the industry. Secondly, the participation of foreign capital can also help to improve the service quality and technology level of the financial industry. In addition, according to BOC research, the rapid growth and structural optimisation of FDI also have a positive impact on China's economy. Finally, the opening of the capital market promotes the high-quality development of the financial industry as well as the whole economy. The regression coefficients of manufacturing scale are 0.3991 and 0.3650, which are not significant. The reason may lie in the fact that the current proportion of manufacturing enterprises above the scale in China is relatively small, and although the degree of financialisation of China's manufacturing industry is higher than that of the world's manufacturing powerhouses, its return on net assets is much lower than that of the financial industry. This means that the manufacturing industry's demand for the financial sector may not be as great as imagined. The regression coefficients of urbanisation level are 0.0437 and 0.0296, and both are significant at the level of 0.1, which is because the higher the level of urbanisation, the better the factor resources and economic development of a region, and the more conducive to the development of open activities in the financial industry.

### 3.2. Robustness tests

In order to ensure the accuracy of the results, this paper intends to use the replacement of the explanatory variables measure with the systematic GMM regression method to test the robustness of the research findings.

#### 3.2.1. Replacing the way manufacturing GVC status is measured

Drawing on the GVC position measurement model constructed by Koopmanetal (2012), the GVC position of the manufacturing sector is re-measured. Specifically, the Koopman measure assumes that an economy's GVC position can be measured through imported and exported intermediates, calculated using the following formula:

$$GVC\_Position_{ir} = \ln\left(1 + \frac{IV_{ir}}{E_{ir}}\right) - \ln\left(1 + \frac{FV_{ir}}{E_{ir}}\right) \quad (3)$$

In equation (3),  $IV_{ir}$  denotes the value added of intermediate goods of industry  $i$  exported by economy  $r$ ;  $FV_{ir}$  denotes the value added content of foreign countries included in the value added of industry  $i$  exported by economy  $r$ ; and  $E_{ir}$  denotes the total value added export value.  $GVC\_Position_{ir}$  denotes the index of the position of a particular industry in the global value chain of an economy, and the larger the index, the more the industry is at the high end of the global value chain division of labour, and vice versa. The larger the index, the higher the position

in the division of labour in the global value chain, and conversely, the lower the position in the low-end chain. Table 2 shows the regression results of the robustness test. The analysis shows that both the quantity and quality of financial sector openness are significantly positively related to the manufacturing industry's GVC position, and the significance is at the 0.1 level. Among them, the quality of financial sector openness has a more obvious role in promoting GVC status, and this conclusion is basically consistent with the benchmark regression results. From this, it can be preliminarily judged that the core findings of this study are robust.

### 3.2.2. Robustness test using systematic GMM method

To ensure the accuracy of the results, the lag 1 period of financial sector openness and global value chain status is treated as an endogenous variable and regressed with its higher-order lag term as an instrumental variable (see Table 3). The analysis shows that the lag 1 period of the manufacturing GVC status index has a positive effect on the value of the current period. Meanwhile, after adding the lagged term, the impact effect of financial sector openness shows a significant decreasing trend. This shows that the impact of financial sector openness on the climbing of manufacturing GVCs is overestimated in the benchmark regression process. Overall, the systematic GMM regression results are generally consistent with the previous benchmark regression results, which can further verify the robustness of the findings of this paper.

Table 2: Robustness test of financial sector openness on manufacturing GVC climb (1)

variant	FON	FOQ
GTI	0.3761	0.4569
constant term (math.)	3.2713	5.389
Other variables	YES	YES
time effect	YES	YES
R2	0.5491	0.4375
sample size	100	100
F	11.333	15.5152

Table 3: Robustness test of financial sector openness on manufacturing GVC climb (2)

variant	FON	FOQ
LGVC	2.2171	2.8864
GTI	0.0379	0.0536
constant term (math.)	3.737	2.485
Other variables	YES	YES
AR	YES	YES
Hansen	12.36	20.57
sample size	100	100
F	11.643	15.6833
Wald	0.0000	0.0000

Note: The original hypothesis of the Wald test is that the coefficients of the explanatory variables of the equation are jointly significant; the original hypothesis of the AR is that there is

autocorrelation; and the original hypothesis of the Hansen test is that the instrumental variables are uncorrelated with the disturbance term.

#### 4. Conclusions and recommendations

This paper uses the Global Multi-Regional Input-Output Model (GMRIO) to measure the position of China's manufacturing industry in the global value chain, and explores the impact effect of the opening up of the financial sector on the climbing up of China's manufacturing industry in the global value chain based on the panel model. The study finds:

(1) Both the quantity and quality of financial sector openness contribute significantly to the upgrading of manufacturing GVCs, with the quality of financial sector openness having a more pronounced effect.

(2) Considering that the behaviour of individuals in the previous period affects their behaviour in the current period, the impact effect of financial sector opening up shows a decreasing trend after adding the lag of the dependent variable, indicating that the current GVC position of China's manufacturing industry is more affected by the GVC position in the previous period.

Therefore, under the current complicated domestic and international economic environment, China should continue to promote the opening up of the financial market on the basis of the principle of prudent opening up, continuously expanding the sources of financing, optimising the structure of the financial market and improving the efficiency of financial services, thus continuously improving the domestic market for intermediate goods and promoting the upgrading of the value-addedness and the international competitiveness of the products and industries. This will continuously improve the domestic intermediate goods market, promote the value-added products and the international competitiveness of the industry, and promote the upward movement of the global value chain of China's manufacturing industry. The Chinese government still needs to continue to improve the financial market system and related institutional construction, and take effective measures to guide the credit resources brought about by the opening up of the financial industry and foreign-funded financial institutions to focus on supporting the R&D and innovation activities of private as well as capital- and technology-intensive enterprises, so as to effectively promote the enhancement of the market competitiveness and international division of labour of such enterprises, and thus provide continuous power support for the high-quality development of China's economy.

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