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**Global Trade Analysis Project**

<https://www.gtap.agecon.purdue.edu/>

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## Abstract

This study considers the implications of US protectionism under the incoming Trump Administration for the United States and its trading partners, in particular for China. As future US trade policy is an unknown at this stage, we model an example of a US protectionist measure- general additional tariff on import from China, stimulate domestic investment and reducing tax rate of company revenue. We analyze their impact on China through dynamic GTAP model.

The scenario results show that Trump's possible policy will do harm to China's development, especially make the target in 13-Five year plan harder to attain. One aspect of impact comes from the capital outflow from China, which could slow down the investment increase, the other impact comes from the trade protectionism which lead to the reduction of export to US from China.

Considering the scenarios assumption that increasing 1 trillion investment during future 4 years in US, reducing tax rate of company revenue from 35% to 20% and additionally increase tariff by 45% from 2017 to 2020, China's GDP will reduce by 1.2 trillion RMB at 2020 relative to baseline, the target of GDP DOUBLE compared to 2010 will hard to get. So China have to find some policy to be countermeasures.

## 1 BACKGROUND OF THE STUDY

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The election of Donald J. Trump as President of the United States has raised a litany of questions about the future of US and global economy. As he promised, his overall economic policy will focus on promoting the domestic real economic recovery and increase the national employment, mainly includes the following six aspects: (i) Fiscal policy initiatives, infrastructure investment will play a positive role in boosting economic growth, is expected to implement a \$1 trillion investment in infrastructure. (ii) Tax cutting, as he promised during the election, the corporate income tax to be reduced from 35% to 15%; (iii) Labor policy, the introduction of restrictions on illegal immigration and other low skill labor immigration, will potentially increase the employment opportunities for the US residents. (iv) Anti-globalization trade policy, He has advocated to strengthen trade protection and safeguard the domestic industry. (v) More aggressive industrial policy, like emphasizing the energy independence, supporting the traditional fossil industry to accelerate the development of domestic coal, oil and gas, to encourage the export of products; (vi) Financial deregulation. He will abolish the Dodd-Frank Wall Street Reform and Consumer Protection Act to loose the financial regulations.

Although there are many difficulties to take these policies into place, we still should pay more attention to the potential impact on China. This paper focuses on the following three aspects of policies and their impacts:

(i) The impact of increased infrastructure investment. Increasing infrastructure investment and expanding domestic demand is expected to be the primary measures to promote the economic growth in the United states. But taking into account the U.S.

government debt has reached \$19 trillion, US government probably invest these projects through PPP model to attract social investment. In this regard, it is should be studied that how much of global capital could flow into United States and flow out of China. Besides this impact, the increases of capital formation in US also could benefit the export of China, which might offset part of negative impact of capital outflow in China.

(ii) The impact of reducing corporate income tax. Although the Trump campaign reducing the tax rate from 35% to a target of 15% is too radical, but the reduction of corporate income tax must be pushed forward by the current government. In this regard, on the one hand the tax cuts are favorable to the production of American enterprises, and the China's exports as well, and on the other hand, we should also pay attention to the decline in operating costs of U.S. companies will attract global capital.

(iii) The impact of trade protection policies. Long term globalization makes the traditional manufacturing industry lack of competitiveness in US. In order to create jobs and protect the local industries, the imposition of tariffs on imported goods is likely to be introduced in US. China is now the largest trading partner of the US, in 2015 China's exports to the US were more than 500 billion U.S. dollars. Mechanical and electrical, furniture and toys, textiles and clothing, as well as black, non-ferrous metals and products, are the four major categories of exports to the United States. If US impose tariff on these import from China, the direct and indirect impact on China should not be underestimated.

In this paper, we model an example of a US protectionist measure- general additional high tariff on import from China, stimulate domestic investment and reducing corporate income tax rate. We analyze their impact on China through dynamic GTAP model.

## **2 MODELLING A US PROTECTIONIST POLICY**

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We apply a recursive-dynamic variant of the standard Global Trade Analysis Project (GTAP) computable general equilibrium (CGE) model to assess the impacts of protectionist measures analogous to the Nixon Measures.

### **2.1 General background on CGE models**

CGE models integrate a number of accounts to provide a complete description of an economy:

- The standard national income and expenditure accounts;
- A breakdown of industry by sector that reflects inter-sectoral input-output links, which take into account internationally-sourced intermediate goods and services (in all, the GTAP dataset allows for the representation of up to 57 sectors, 43 of which are goods);
- A production function for each sector that combines sector-specific inputs of capital, skilled and unskilled labour, and intermediate inputs; and

- A trade account that models the international linkages for each sector of the economy.

The CGE framework generates impact results for the following aggregates:

- National accounts (consumption, investment, government expenditure, real exports, and real imports);
- Economic welfare (equivalent variation);
- Sectoral production, imports, exports (bilateral with the EU, with Vietnam's partners, and global), and domestic shipments;
- Impacts on capital formation and labour (skilled and unskilled);
- Price impacts (consumer prices and terms of trade); and
- Government revenue.

On the production side, the model evaluates efficiency gains from reallocation of factors of production across sectors. In the first stage, land, labour (skilled and unskilled), and capital substitute for one another to generate domestic value-added by sector; intermediate inputs, which include imported intermediates, substitute for domestic value-added in a second stage.

On the demand side of the model, an aggregate Cobb-Douglas utility function allocates expenditures to private consumption, government spending, and savings so as to maximize per capita aggregate utility. Following a shock, the changes in consumption are allocated across these three aggregates based on their income shares in each region. Private household demand responds to changes in prices and income based on the standard Constant Difference of Elasticities (CDE) demand system in the GTAP model.

The trade module assumes imperfect substitution based on product differentiation across regions. The key parameter determining the scale of impacts on trade from a tariff shock is the elasticity of substitution – a high substitution elasticity generates relatively large trade impacts for a given size of tariff shock. Note that the GTAP sectors reflect relatively large aggregates of individual products; accordingly, substitution elasticities are lower than they would be for product categories that are defined more narrowly and, thus, are more substitutable for each other.

Economic welfare is based on “equivalent variation”, the lump sum payment at pre-shock prices that would have to be made to households to leave them as well off as in the post-shock economy.

We use a perfect competition specification of the GTAP model. Some models incorporate imperfect competition for industrial goods sectors, introducing price mark-ups that represent monopolistic pure profits in equilibrium. These price mark-ups are reduced by intensified competition under trade liberalization, generating additional welfare gains.<sup>1</sup> A number of recent models incorporate heterogeneous firms features, which generate

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<sup>1</sup> See Roson (2006) for a review of the issues raised by this methodology.

productivity gains from reallocation of market shares to more productive firms under trade liberalization.<sup>2</sup>

For a technical description of the basic GTAP model, see Hertel (1997); for a discussion of the degree of confidence in CGE estimates, see Hertel et al. (2003).

## 2.2 The Recursive-Dynamic Framework

The recursive dynamic variant of the GTAP model features an investment module in which capital supply responds to changes in the rates of return (ROR) to capital. The recursive dynamic investment framework is based on the Monash-type investment function (Dixon and Rimmer, 2002). In this function, the growth rate of capital (and, hence, the level of investment) is determined by investors' willingness to supply increased capital to each sector in each country, which in turn depends on changes in the expected ROR for capital in that sector and region. Assuming that investors are cautious, any shock to the ROR in a given sector and region is, however, eliminated only gradually. This results in similar treatment of investment as in models that incorporate costs of adjustment that are positively related to the level of investment in a given year (based on, e.g., construction/installation costs of capital suppliers). The Monash model, however, instead of relying on increasing adjustment costs as the mechanism to limit investment, incorporates investor perceptions of risk for this purpose.

The parameter that mediates the supply response of capital – i.e., the elasticity of the supply of capital to RORs – is set at unity, based on firm-level gravity modelling.

## 2.3 Closures

Given that we use a dynamic version of the GTAP model, capital responds to changes in the ROR on capital. Both labour and capital are assumed to be mobile across all sectors within a country. Labour can also respond to changes in the wage rate; however, for the present study, the total labour supply is assumed to be fixed, implying a long-run elasticity of labour supply with respect to wages of zero – i.e., there are no changes in total employment as a result of the policy measures being modelled. In reality there will be a positive response of labour to wage changes; accordingly this closure understates the actual impacts.

We assume that productivity rises in line with wages, thus supporting the real wage gains generated in the simulation. This is effected by splitting the increase in the factor payments to labour into productivity and real wages. With this assumption, the model behaviour is in line with historical experience concerning the co-movement of wage rates and productivity, which in turn is consistent with microeconomic theory that labour is paid its marginal product, and heterogeneous firms theory and empirics which establishes that stronger firms, which gain market share under trade liberalization, are more productive and pay higher wages.<sup>3</sup>

For the external closure, given the interest of the United States in affecting its external balance

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<sup>2</sup> These include Zhai (2008); Dixon et al. (2013); Balistreri and Rutherford (2013); Oyamada (2013); and Itakura and Oyamada (2013). See Roson and Oyamada (2014) for a review.

<sup>3</sup> See Ciuriak, 2016, "Calibrating Wage-Productivity Responses in CGE Model Simulations of Trade Policy Impacts," Available on <https://ssrn.com/abstract=2839624>

through the policy measures, the closure that allows the external trade balance to adjust is necessarily adopted.

## **2.4 The policy Shock**

The policy shock is simple:

Scenario 1: general Impact on China of Trump policy. Suppose the United States propose additional infrastructure investment of \$250 billion from 2017 to 2020, the total additional investment will be \$1 trillion; The new US government propose a decrease of corporate income tax rate from the current 35% to 20% from 2017; and US levy an extra 45% high tariff on China's imports of goods on the basis of the current level from 2017.

Scenario 2: As the countermeasure, we assume China take policies to recover the investment confidence to increase the capital formation. Scenario 2 includes all shocks in scenario 1, and also involves a new shock showing China's active fiscal policy in the years 2017-2020, which is the annual additional 150 billion investment in capital formation, four year cumulative increase of 600 billion (scenario 2), equivalent to offset 50% of GDP loss (shown in the follows) in scenario1.

Scenario 3: Besides the countermeasure in scenario 2, we also assume that China will actively negotiate with the US about the import tariff rate, and finally there will be only 10 percentage higher than the present level.

## **3 RESULTS AND CONCLUSIONS**

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### **3.1 The potential impact of Trump's policy on China**

The macroeconomic effects of China and the United States are shown in table 1.

Generally, US infrastructure investment and tax reduction policy will attract large scale of global capital flow, which lead China's investment heavily lost compared with baseline. From 2017 to 2020, the loss of China's capital formation will expand year on year, and the loss will be more than 1.6 trillion RMB (2010 price, the same below) (-4.1%) compared with baseline. And if US government impose an additional 45% tariffs on import from China from 2017, China's exports have to face a very difficult situation, the loss relative to baseline will be 450 billion (-3.4%). But, if take all those three policies into account, China's exports loss, coupled with China's actual currency devaluation, will be gradually restored from 2017 to 2020, and China's exports in 2020 will only be 130 billion loss (-0.87%). Both the loss in investment and exports lead China's economy lost compared to baseline, and the loss extended gradually from 2017 to 2020, the loss will be 1.2 trillion in 2020(-1.5%).

China's current "13th Five-Year" development plan pointed out that the 2020 GDP reached 82 trillion and 700 billion (2010 price). However, by the impact of Trump's economic policy, in 2020 GDP is expected to be reduced to 81.5 trillion, won't achieve the goal of doubling (GDP41.3 trillion in 2010, the target should reach 82 trillion and 600 billion in 2020). In accordance with the requirements of the bottom line of economic

development, China has to take positive countermeasures.

### **3.2 Stimulate domestic investment in China can effectively reduce the negative impact of capital outflow**

Trump's economic policy has the greatest negative impact on China's investment. As the countermeasure, China should take measures to strengthen domestic investment confidence to stimulate domestic investment. Now there is a serious shortage of investment in the real economy, a large amount of capital concentrate in the financial market. Even if the international capital outflows, as long as the investment confidence can be restored, the loss of domestic investment can be alleviated to some extent.

As shown in Scenario 2, that the implementation of active fiscal policy is conducive to alleviate the economic losses caused by Trump's economic policy. Loss of China's investment at 2020 relative to baseline will be 1 trillion (-2.55%), which is narrowed by 600 billion comparing with scenario 1. The GDP loss relative to the baseline scenario will be 800 billion (-1%), narrowed by 400 billion if comparing to scenario 1. This is mainly because that the additional increase in investment demand will replace some of the exports, so that the loss of exports reached 280 billion (-1.78%).

### **3.3 Striving to avoid US imposed high tariffs on imported goods**

Compared with Trump to stimulate the U.S. domestic economic policy, high tariffs on imports from China will heavily do harm to China's economy. To implement the proactive fiscal policy, China also have to strengthen the international negotiations, and strive to avoid the high tariffs on China's imports of goods.

According to the situation of the Scenario 3, lower increase of tariffs will alleviate the negative impact on China's export, and taking considering the positive impact from US domestic policy, China's overall export will be a positive growth of 180 billion (+1.2%), the net export will be positively growth by 700 billion. On the whole, the loss of GDP relative to the baseline will fell to 500 billion in 2020 (-0.6%). That means the development target in 13th-Five year plan can be achieved finally.