

A MERCANTILIST APPROACH TO THE CHINESE ECONOMIC GROWTH: BALANCE OF TRADE, GDP, AND INVESTMENT

UN ENFOQUE MERCANTILISTA DEL CRECIMIENTO ECONÓMICO CHINO: BALANZA COMERCIAL, PIB E INVERSIÓN

UMA ABORDAGEM MERCANTILISTA DO CRESCIMENTO ECONÔMICO CHINÊS: BALANÇA COMERCIAL, PIB E INVESTIMENTO

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Abstract

This paper studies the short-run and long-run relationships between trade, investment, and the Chinese economic growth from 1992 to 2019. A vector error correction (VEC) model was estimated in order to analyze the causal relationships among balance of trade, investment (both national and foreign), and economic growth. The results helped us to discuss the mechanisms considered within the mercantilist literature to relate a positive balance of trade and economic growth. Particularly, the estimation suggests that the causality mechanism between the variables is closer to a financial mercantilist or developmental explanation or rather than a monetarist mercantilist approach. That is, the positive effect of the commercial balance on economic growth in China seems related to the increase of national investment, instead of the attraction of foreign direct investment.

Keywords: Trade; mercantilism; economic growth; China, commercial balance; Foreign Direct Investment.

Resumen

Este documento estudia las relaciones de corto y largo plazo entre el comercio, la inversión y el crecimiento económico chino desde 1992 hasta 2019. Se estimó un modelo de corrección de errores vectoriales (CEV) para analizar las relaciones causales entre la balanza comercial, la inversión (tanto nacional como extranjera), y el crecimiento económico. Los resultados nos ayudaron a discutir los mecanismos considerados dentro de la literatura mercantilista para relacionar una balanza comercial positiva y el crecimiento económico. La estimación sugiere un mecanismo causal entre las variables más cercana a la explicación del mercantilismo financiero o del desarrollismo frente al acercamiento del mercantilismo monetario. Esto es, el efecto positivo de la balanza comercial sobre el crecimiento económico de China parece estar relacionado con el aumento de la inversión nacional en vez de la atracción de inversión extranjera directa.

Palabras clave: Comercio; mercantilismo; crecimiento económico; China; balanza comercial; Inversión Extranjera Directa.

Resumo

Neste artigo, são estudadas as relações de curto e longo prazo entre o comércio, o investimento e o crescimento econômico chinês de 1992 a 2019. Foi utilizado um modelo de vetor de correção de erros para analisar as relações causais entre a balança comercial, o investimento (nacional e estrangeiro) e o crescimento econômico. Os resultados nos ajudaram a discutir os mecanismos considerados dentro da literatura mercantilista para relacionar uma balança comercial positiva e o crescimento econômico. A estimativa sugere um mecanismo causal entre as variáveis mais próximo da explicação do mercantilismo financeiro ou do desenvolvimento diante da aproximação do mercantilismo monetário. Isto é, o efeito positivo da balança comercial sobre o crescimento econômico da China parece estar relacionado com o aumento do investimento nacional em vez da atração de investimento estrangeiro direto.

Palavras-chave: comercio; mercantilismo; crescimento económico; China; balança comercial; investimento estrangeiro direto.

Introduction

Mercantilism may be seen as a particular mechanism with a causal origin in the accumulation of foreign exchange and a Developmental State feature, as explained by Woo-Cumings (1999). Developmental State refers to the strategy that seeks accelerated capitalist development through the rational planning that combines the State's guiding force and the private firms' initiative. Such strategy includes: 1) a strong and legitimated State, 2) a nationalism capable of leading the population to make sacrifices in exchange for future development, 3) an efficient bureaucracy and elite corps with broad economic and social planning powers, 4) policies to promote savings (or disincentive consumption), 5) the cartelization of national firms to make them internationally competitive, 6) the exclusion of foreign direct investment (FDI) or its conditioning, 7) a robust financial system controlled by the State, 8) a selection of strategic sectors based on current and potential capabilities to promote; 9) a commercial policy based on performance, and 10) an educational, technological and scientific policy linked to the productive sectors.

None of the elements mentioned above should be considered isolated, they should be seen as part of an overall strategy and as links of a mechanism. From this perspective, no policy makes sense by itself; its relevance lies in the fact that it contributes to achieving a general goal, usually stated in terms of economic growth. The Developmental State approach is pragmatic and contradicts neoliberalism, since the latter is claimed to be ideological and focused on static efficiency instead of dynamic transformation (Chang, 1999).

Mercantilism may be perceived as an attempt to bring back a theory long surpassed. Joseph Schumpeter (1954, p. 336) made such observation when he analyzed the mainstream liberal economists of his time and found nothing but errors on the work of any ancient economist containing the slightest trace of mercantilism. Those economists from the Anglo-Saxon tradition, who based their critique on Adam Smith, never understood that mercantilism was a theory of economic practice (see Woo-Cumings, 1999, pp. 4-5).

Mercantilism, whose goals are economic growth and technological advancement, can be viewed as a reflection of economic nationalism aimed at constructing prosperous and mighty nations. Although it is complex to refer to its specific economic policy measures, due to its pragmatic nature, we can mention increasing national production and focusing on technological improvement through growing exports that have high aggregate value. Since the country may not be competitive in producing those goods and services, the mercantilist approach considers applying commercial policy measures to transform and dynamize the country's productive capabilities. Those measures may include tariffs, subsidies to exports (direct or indirect) through, for example, the provision of vital infrastructure. Ideally, such an approach would end up with the country specializing in exporting technologically advanced products, making the country achieve a surplus commercial balance due to its ability to create greater aggregate value.

This paper aims to relate the definition of mercantilism given above with China's economic growth model of the last decades. To do so, we analyzed the dynamic relationship between the Chinese balance of trade and its economic growth. To reinforce the developmental interpretation of the mercantilist approach and to differentiate it from other variations that have dug into the possible relationship between commercial balance and economic growth, we will include national and foreign investment.

We focus our analysis solely on the Chinese case due to two main reasons. On the one hand, conducting a study focused solely on China seemed more relevant due to its population, recent economic growth and importance, and its share within the major world biggest economic figures, than making cross country studies including several smaller countries. On the other hand, we are not looking at the natural relationship between economic variables but at the consequence of a particular economic policy approach. Therefore, it would make no sense to include countries for which there is little basis for considering a mercantilist economic policy.

Related literature

A mercantilist policy is sometimes oversimplified, defined as an accumulation of reserves, and considered to represent in itself an increase of wealth. Alternatively, within the modern approach to mercantilism, as we will briefly examine, the particular mechanism used

to achieve positive commercial balances, which gives access to reserves that are useful to increase production, has been discussed. This paper does not focus on the mercantilist hypothesis related to increasing reserves but on the achievement of a positive balance of trade. Furthermore, this macro-magnitude is related to the country's growth model as one of its characteristics but does not reduce its relationship to economic growth to a single causal mechanism.

On the other hand, the fact that a country has consistent surpluses in its commercial balance is not only due to its own economic policy, but also to those of its most important trading partners. Bonatti and Fracasso (2013) show how, in a two-period model, a mercantilist policy of reserve expansion that has a positive effect on GDP growth, can be compatible with a policy of maximizing household consumption in the commercial counterpart. The United States –one of the most important destinations for a significant share of China's exports— might stimulate a looser monetary policy which would complement the Chinese one, in order to promote the same effect on the balance of trade.

Regarding the particular mechanisms through which a positive commercial balance may affect the economic growth, two main hypotheses have been described: the monetarist mercantilism and the financial mercantilism. From a monetarist perspective, accumulation of reserves has positive effects on growth. Dooley *et al.* (2005) consider that an expansion of international reserves, as a result of keeping an undervalued exchange rate, can offer collateral to FDI and, thus, facilitate their attraction. Although failing to comply with this transmission mechanism is problematic, comparing the effects of the positive commercial balance on growth with that of FDI can help to observe whether, in line with causality, there is a common temporality in the movements of the macro-magnitudes in the expected direction. In addition, they explain that the counterpart (in a two-country simplification) induces demand for its financial assets by maintaining a trade deficit, which makes its financing cheaper.

Such an approach would be consistent with that of China, since it gives a higher priority to its productive sector, for example, when the country grants benefits to State-owned enterprises (SOEs) in the government's objective function as Branstetter and Feenstra affirm (2002). The preceding may seem to contradict the increasing share of household consumption, as it has been the case during the last years in China (see Lardy, 2016). We should be careful not to get confused with this interpretation, despite its usefulness in the short term. From a dynamic point of view, which makes more sense from a developmental perspective, improving productive capacities would generate, in the long term, an increase in income and a consequent increase in consumption.

Also, within monetarist mercantilism and more closely related to historical events that occurred in Asia, we resort to the explanation provided by Ben-Bassat and Gottlieb (1992). They stated that maintaining international reserves helps to preserve the stability of the financial system. Then, in the face of a capital flight, such as the one that occurred in the Republic of Korea in 1997, the countries with better reserves managed to offset the capital flight, making any related panic disappear.

The financial mercantilism approach, on the other hand, focuses on the role of the financial sector in boosting exports (see Azienman and Lee, 2008). This second mechanism

generates a virtuous circle, whereby the resources from a positive commercial balance are invested in the export sector to induce greater growth, which, in turn, boost the balance of trade. In this case the competitiveness of the exports and the absorption capacity of the international demand need to be maintained. The former cannot be considered exogenous and is related to the mercantilism's broader view, as it has been previously explained. Although reaching a sufficient international demand can be facilitated through export promotion agencies and trade deals, access to a foreign market can sometimes be out of the national economic policy's reach and be treated as exogenous. We can consider that such demand has not remained stable in recent years in China. The reduction in demand from the United States since the 2008 crisis has led to a change in China's model regarding its balance of trade, as well as to a search for new markets, under the Belt and Road Initiative. (BRI).

Also, close to the financial mercantilism approach, Prestowitz (2021) has argued that accumulating positive balances of trade allows obtaining the necessary capital to get investments done in China. The developmentalist perspective differentiates national capital from foreign one and favors the former, due to, among other reasons, the greater political control that can be exerted on it. This strategy has also been complemented with the promotion of national technology (Schell and Shirk, 2019). The mercantilist logic has also been applied to explain the Chinese model when discussing specific sectors, such as the energetic one (Lind and Press, 2018).

This mechanism has also been highlighted by the United Nations Conference on Trade and Development (UNCTAD) on its reports, acknowledging that such causal mechanism may vary in accordance to the particular policies applied in the country. The Chinese case has been described as being selective on exports and promoting imports of technology, instead of attracting FDI (UNCTAD, 2003, p.64). China, as well as other East Asian countries, such as Japan and South Korea, are examples of an Asian model that promotes a positive relationship between investment and exports by dialoguing with the private sector and disciplining it when necessary (UNCTAD, 2021, p.50).

Although the above mechanisms may be complementary, their relative importance can be weighted through FDI participation since monetary mercantilism is based more on attracting it as a funding source. On the other hand, a strategy close to the financial mechanism could be identified in China's growth through national financing. The preceding would be related to greater state control of the financial sector and greater access to these resources by national companies, such as state-owned enterprises (SOEs). Therefore, it is interesting to explore the empirical causality between commercial balance and economic growth, taking into account FDI and domestic investment dynamics.

Although the total share of FDI in the Chinese economy as a whole has not been large, its specific relationship with some economic aggregates, such as exports, and its importance at the mesoeconomic level, as in the provinces, has been more noticeable. In fact, FDI received in China can be linked to the increase in exports (Zhang and Song, 2001) and economic growth (Yao, 2006) at the provincial level.

To observe a relationship between the variables in which there are no structural changes, it is necessary to delimit the period of econometric analysis. This is related to the

statistical consideration of structural breaks and qualitative and quantitative deliberation, considering other data sources, which allow locating the growth period through the referred economic model, that is, via growth of the balance of trade. Before 1978, Chinese trade was concentrated in 12 companies of the Ministry of Foreign Trade. Furthermore, the exchange rate had been overvalued (1.5 RMB per U.S. \$) to favor the import of capital goods until 1981. The access to subsidized foreign exchange was tightly controlled through capital restrictions. In addition to licenses and quotas, the average tariff in 1982 was 56%. During the 1990s, tariffs were reduced, reaching 15% in 1992 (see Brasntetter and Lardy, 2006). Similarly, restrictions on licenses and quotas decreased notably since the early 1990s, affecting only 18% of imports by 1992 (Lardy, 2002). Although the trade liberalization must be interpreted as a gradual process, we can refer to the early 1990s as the time when exports and imports took a much more significant role within the Chinese economic model.

Licenses and quotas were gradually eliminated and tariffs were reduced in accordance with the demands made by the World Trade Organization (WTO) to allow China's entry. Although the acceptance occurred in 2001, the measures had already begun to be implemented years before. The overvaluation of the renminbi was gradually corrected throughout the 1980s until it reached 8.3 RMB per U.S. \$ in 1995. In any case, it can be considered that Chinese authorities were motivated to boost exports, as shown by the exemption of indirect taxes for exporting companies. Such practice was allowed by the WTO for countries that had a low share of direct taxes in their tax system.

China's access to the WTO was also related to FDI conditionality. In fact, from the Agreement on Trade-Related Investment Measures, China has been obliged to maintain a criterion of equal treatment of foreign investment. However, the conditionality on technology transfers, which China has motivated with investing companies, is outside this agreement. For instance, 21% of the companies that take part in the American Chamber of Commerce in Shanghai declared having faced pressure to transfer technology, while that share reached 44% in the aerospace sector, and 41% in chemicals (Strub *et al.*, 2018). This seems to indicate that the Chinese authorities do not trust that technology transfers will take place automatically. The conditionality of FDI and its low relative participation motivated China not to consider it one of its development model's fundamental forces, in accordance with the previous Japanese and Korean experiences. Whalley and Xin (2006) estimated that the absence of FDI through foreign-invested enterprises (FIE) reduced Chinese economic growth by 3.4 percentage points. This estimate is considered an upper bound since FDI is assumed as the only financing source of the FIEs. Even under this extreme assumption, much of the Chinese economic growth would be attainable.

Protectionist tariff measures are still maintained within the limits allowed by the WTO in China. That is why we can say that Chinese policymakers are implementing mercantilist policies, regarding commercial policies. For example, Brandt, Rawski and Sutton (2005) defend some of the Chinese protectionist measures in the automotive industry, based on the Hamiltonian argument of the infant industry.

As we have mentioned before, the selective nature of the mercantilist policy for the promotion of exports is one of its main characteristics. Rodrik (2006) explained that China specialized in exporting a variety of goods that have a greater technological content than the

ones that could be expected from a country at its level of income. Currently, for instance, electrical machinery and electronics are some of its main exports. However, in this paper we have focused on total trade and not on its composition.

Finally, it should be mentioned that the situation of greater protection or the preponderance of national investment need not be determined as the result of solely a set of protectionist measures. Cultural differences, particularly with western countries, also constitute natural entry barriers that might reduce investments and exports from these countries or might make them less productive. Along these lines, Gao (2003) pointed out that FDI has come to China in a more significant proportion from countries that have a higher share of population of Chinese origin.

Empirical Analysis

This section evaluates the long-term relationship between the GDP, the Trade Balance Index (TBI), the FDI and the Chinese Domestic Investment (DOMI), following Engel and Granger (1987), Charemza and Deadman, and Dash (2005). Once the database was built, the integration level of each series was evaluated, which unlike a VAR (Vector autoregression) model should be I(1). Based on the VAR methodology we evaluated the number of lags in the model and the existence of cointegration. Next, we constructed the VEC model whose main requirement was that the error correction term had a negative sign and was significant. This allowed us to conclude that there was a long-term relationship of the structural equation. Finally, tests were conducted to verify the non-autocorrelation, homoscedasticity, and normality of errors.

Data Description

Chinese quarterly gross domestic product expressed in yuans was converted into U.S. dollars using the quarterly nominal exchange rate. The TBI, i.e., the ratio of exports to imports, was obtained directly from the source.¹ Foreign Direct Investment (FDI) came from two sources. One is expressed in quarterly U.S. dollars from 1998Q1 to 2013Q4.² To fill the blanks for the 1992Q1-2019Q4 series, we used annual data for FDI inflows obtained from the World Development Indicators (World Bank, 2020). Annual data was transformed into quarterly data, applying the “linear-match last version of the low to high frequency method”³. Finally, to obtain DOMI we subtracted FDI from Gross Fixed Capital Formation in China (GFKF). The GFKF

¹ Current Price Gross Domestic Product in China, Chinese yuan, Quarterly, Seasonally Adjusted; Nominal exchange rate: China/U.S. Foreign Exchange Rate, Chinese yuans to One U.S. Dollar, Monthly, Not Seasonally Adjusted; US Consumer Price Index and Ratio of Exports to Imports for China, Quarterly, Seasonally Adjusted were obtained from Federal Reserve Economic Data. Economic Research Division, Federal Reserve Bank of St. Louis.

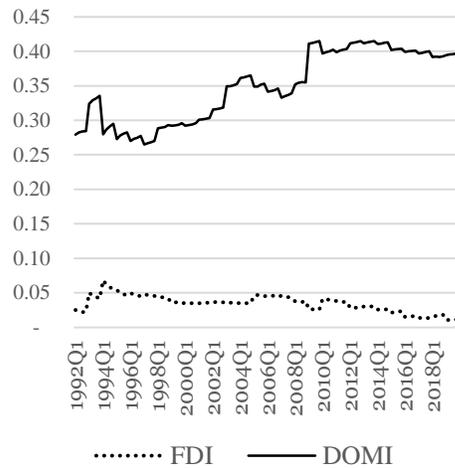
² Financial Account: Liabilities: Direct Foreign Investment in Reporting Country for China (DISCONTINUED), US Dollars, Sum Over Component Sub-periods, Quarterly, Not Seasonally Adjusted. 1998-Q1-2013Q4. was obtained from Federal Reserve Economic Data. Economic Research Division, Federal Reserve Bank of St. Louis. Annual data for foreign direct investment inflows to China for the 1992-2019 period were obtained from World Development Indicators, World Bank.

³ This method inserts the low frequency observation into the last period of high frequency data, then performs linear interpolation on the other values. This method first places the annual observation into the last trimester observations in the corresponding year. In-between trimester observations are filled by performing a linear interpolation between the last trimester of the previous year and the last trimester of the current one.

was converted into U.S. dollars and transformed to quarterly data.⁴ After all the series were seasonally adjusted and expressed in current U.S. dollars, we expressed them in 2015 U.S. constant dollars using the U.S. Consumer Price Index. The data is presented in Figure 1. In the model, we consider the TBI (*TBI*) and the natural logarithms of Chinese GDP (*GDP*), Chinese foreign direct investment inflows (*FDI*), and domestic Chinese investment (*DOMI*).

Figure 1. Tendencies of the explanatory variables

Panel A: FDI and domestic investment as a proportion of GDP



Panel B: Trade Balance Index (Exports/Imports)



Unit Root Tests

Unit root tests are shown in table 1, and 2 using the Phillips-Perron Test⁵ for the four quarterly series expressed in logarithms for the 1992Q1-2019Q4 period. These tests indicated that all the series have the same level of integration: all are I(1).

Table 1. Phillips-Perron Test. Levels

Variable	Intercept	Trend and Intercept	None
<i>GDP</i>	-1.010959	-1.375462	6.264839
<i>TBI</i>	-3.132210	-3.263764	-0.152704
<i>FDI</i>	-2.694989	-2.008852	1.324020
<i>DOMI</i>	-0.957165	-1.108353	5.668920

Note: the critical values with intercept, with trend and intercept, and none at the 1%, 5% and 10% significance levels are respectively: -3.490210, -2.887665, -2.580778; -4.042819, -3.450807, -3.150766; -2.585962, -1.943741, -1.614818.

⁴ Gross Fixed Capital Formation in China, Chinese yuans, Annual, Not Seasonally Adjusted. Federal Reserve Economic Data. Economic Research Division, Federal Reserve Bank of St. Louis.

⁵ One advantage of the Philips-Perron test is that it is non-parametric, i.e., it is not required to select the serial correlation level as in the ADF test. Instead, it adopts the same estimation scheme as the DF test but corrects the statistic by autocorrelation and heteroscedasticity. The PP test is based on the asymptotic theory; Therefore, it works better in medium and large samples. In our case, we have 112 observations which justify using this test.

Table 2. Phillips-Perron Test. 1st. Differences

Variable	Intercept	Trend and Intercept	None
GDP	-12.17170	-12.14245	-10.31837
TBI	-10.35260	-10.31421	-10.40002
FDI	-10.50263	-10.85423	-10.33985
DOMI	-10.58742	-10.59605	-8.685325

Note: the critical values with intercept, with trend and intercept, and none at the 1%, 5% and 10% significance levels are respectively: -3.490210, -2.887665, -2.580778; -4.042819, -3.450807, -3.150766; -2.585962, -1.943741, -1.614818.

Estimation of the VEC Model

As the variables are of order $I(1)$ at 1% of significance, this section estimates a VAR model in order to check its stability and proceed to the estimation of the VEC. The VAR includes the variables *gdp*, *tbi*, *fdi*, and *domi*. After the VAR was estimated, the order of the lags was determined. See Table 3.

Table 3. VAR Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	H.O.
0	-311.1143	NA	0.006341	6.290659	6.697489	6.455478
1	654.7199	1783.078	7.41e-11	-11.97538	-11.16172*	-11.64575*
2	663.1211	14.86373	8.60e-11	-11.82925	-10.60876	-11.33480
3	670.5056	12.49684	1.02e-10	-11.66357	-10.03625	-11.00430
4	681.6938	18.07321	1.13e-10	-11.57103	-9.536888	-10.74694
5	734.3796	81.05510*	5.66e-11*	-12.27653*	-9.835555	-11.28762
6	742.7421	12.22203	6.70e-11	-12.12966	-9.281850	-10.97593
7	747.8129	7.021093	8.50e-11	-11.91948	-8.664843	-10.60093
8	759.1290	14.79809	9.65e-11	-11.82940	-8.167940	-10.34604

Due to the fact that the data analyzed for this paper was quarterly, the Schwarz and Hannan-Quinn information criteria was followed, and five lags were considered. Also, according to Asghar and Abid (2007) samples of size between 60 and 120 Hannan-Quinn would have the greatest probability of a correct identification, while sample with sizes greater than 120 would be the Schwarz information criterion. As Table 4 evidences, no root lies outside the unit circle, thus, it is possible to conclude that the VAR model satisfies the stability condition (Pesaran and Pesaran, 1997).

Table 4. Roots of the VAR model

Root	Modulus
0.994773 - 0.018086i	0.994938
0.994773 + 0.018086i	0.994938
0.828513 - 0.247382i	0.864657
0.828513 + 0.247382i	0.864657
0.193632 + 0.816074i	0.838731
0.193632 - 0.816074i	0.838731
0.833935	0.833935
-0.806819 - 0.164313i	0.823380
-0.806819 + 0.164313i	0.823380
0.699851 - 0.385087i	0.798801
0.699851 + 0.385087i	0.798801
-0.145183 - 0.783044i	0.796389
-0.145183 + 0.783044i	0.796389
0.475483 - 0.574602i	0.745823
0.475483 + 0.574602i	0.745823
-0.462979 - 0.538926i	0.710486
-0.462979 + 0.538926i	0.710486
-0.168600 - 0.656051i	0.677369
-0.168600 + 0.656051i	0.677369
-0.578502	0.578502

After, the stability of the VAR estimation was checked, the cointegration of the variables was verified. For that purpose, a Juselius Johansen Test with five lags for variables was performed: gdp, tbi, fdi, and domi considering an intercept (Model ii).⁶ Tables 5 and 6 show the results. Johansen's method suggests two statistics to determine the number of vectors of cointegration: the trace statistic and the proof of the maximum eigenvalue (Johansen and Juselius, 1990). The critical values appropriate for the test are given by Osterwald-Lenum (1992). The null hypothesis and alternative were tested using these statistics.

Table 5. Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of C.E. (s)	Trace Statistic	0.05 Critical Value	Prob**
None *	67.42273	54.07904	0.0021
At most 1	32.20538	35.19275	0.1014
At most 2	12.88559	20.26184	0.3731
At most 3	1.476884	9.164546	0.8775

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* Denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 6. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of C.E. (s)	Max-Eigen Statistic	0.05 Critical Value	Prob**
None *	35.21735	28.58808	0.0061
At most 1	19.31979	22.29962	0.1238
At most 2	11.40870	15.89210	0.2230
At most 3	1.476884	9.164546	0.8775

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

* Denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Johansen's cointegration test suggests that the non-cointegration vectorial hypothesis can be rejected at least at the level of five percent, thus indicating the presence of a cointegration relationship. The presence of at least one relation of cointegration between the variables in levels justifies the use of a model VEC; that is, a model that combines the short-term properties of economic relationships with long-term data information, in the form of a level provided by the Johansen test.

The next step was to estimate a VEC and then concentrate on the first equation:

$$\Delta y_t = \beta_0 + \sum_{i=1}^N \beta_i \Delta y_{t-i} + \sum_{i=1}^N \delta_{1,i} \Delta x_{1,t-i} + \dots + \sum_{i=1}^N \delta_{j,i} \Delta x_{j,t-i} + \sum_{i=1}^M \theta_i D_i + \varphi Z_{t-1} + \mu_t \tag{VI.1}$$

In which y is the dependent variable in the first equation of the VEC, $x_i, i=1, \dots, 3$ are the variables that appear as dependent on the other equations of the VEC, but as independent in the first equation, D_i is exogenous variables for all the VEC and Z_{t-1} is the residual of the cointegration equation. The error-correction term, φ is related to the deviation of the last period of the long-term equilibrium (the error), and it influences the short-term dynamics of

⁶ Included observations: 106 after adjustments. Lags interval (in first differences): 1 to 5.

the dependent variable. Thus, the coefficient ϕ measures the speed of adjustment, to which, the $\ln(M)$ variable returns to equilibrium after a change in the independent variables.

Table 7⁷ shows the results of the estimation of the equation (V.3). The adjusted R2 is 0.705, above 50%, so a good fit was obtained. It was also possible to identify that the first term of error correction, ϕ , has the expected sign and is significant: -0.474974, (0.089195), [-5.325104]. This implies that the model returns to its equilibrium level at a rate of 47.50% per quarter. These results confirm that there exists a long-term joint *causality* of all independent variables towards GDP.

Table 7. The cointegration equation is given by Cointegration equation*

$gdp_{t-1} =$	2.501	+ 0.603	tbi_{t-1}	- 0.176	fdi_{t-1}	+ 0.970	$domi_{t-1}$
	(0.208)	(0.120)		(0.055)		(0.035)	
	[12.038]	[5.041]		[3.206]		[28.121]	

*Standard errors in () & t-statistics in [].

The first term of error correction, ϕ , has the expected sign and is significant: -0.105, (0.042), [-2.493]. This implies that the model returns to its equilibrium level at a rate of 10.55 % per a quarter. This result confirms that there exists a long-term joint *causality* of all independent variables towards imports. Furthermore, the long-term parameters of the dependent values are significant and have the expected signs, except for FDI.

⁷ To achieve normality, we use 7 dummy variables. D1:1994Q1, D2:1995Q1, D3:1996Q1, D4:1997Q1, D5: 2009Q1, D6:2018Q2, D7:2018Q3.

Table 8. VEC GDP, TBI, FDI, DOMI

$\Delta(\text{gdp}) = c(1)*z(-1) + c(2)*\Delta(\text{gdp}(-1)) + c(3)*\Delta(\text{gdp}(-2)) + c(4)*\Delta(\text{gdp}(-3)) + c(5)*\Delta(\text{gdp}(-4)) + c(6)*\Delta(\text{gdp}(-5)) + c(7)*\Delta(\text{tbi}(-1)) + c(8)*\Delta(\text{tbi}(-2)) + c(9)*\Delta(\text{tbi}(-3)) + c(10)*\Delta(\text{tbi}(-4)) + c(11)*\Delta(\text{tbi}(-5)) + c(12)*\Delta(\text{fdi}(-1)) + c(13)*\Delta(\text{fdi}(-2)) + c(14)*\Delta(\text{fdi}(-3)) + c(15)*\Delta(\text{fdi}(-4)) + c(16)*\Delta(\text{fdi}(-5)) + c(17)*\Delta(\text{domi}(-1)) + c(18)*\Delta(\text{domi}(-2)) + c(19)*\Delta(\text{domi}(-3)) + c(20)*\Delta(\text{domi}(-4)) + c(21)*\Delta(\text{domi}(-5)) + c(22)*D1 + c(23)*D2 + c(24)*D3 + c(25)*D4 + c(26)*D5 + c(27)*D6 + c(28)*D7$				
	Coefficien	Std. Error	t-Statistic	Prob.
C(1)	-0.105454	0.042307	-2.492570	0.0148
C(2)	0.304842	0.126512	2.409585	0.0183
C(3)	0.063719	0.106344	0.599174	0.5508
C(4)	-0.090992	0.104470	-0.870988	0.3864
C(5)	0.974823	0.129799	7.510263	0.0000
C(6)	-0.137964	0.145363	-0.949104	0.3455
C(7)	-0.008091	0.039375	-0.205489	0.8377
C(8)	-0.069069	0.036858	-1.873899	0.0647
C(9)	-0.003856	0.035772	-0.107789	0.9144
C(10)	-0.022062	0.034769	-0.634541	0.5276
C(11)	-0.057641	0.033950	-1.697809	0.0935
C(12)	0.026233	0.024109	1.088113	0.2799
C(13)	0.001375	0.015849	0.086770	0.9311
C(14)	0.050328	0.015481	3.250968	0.0017
C(15)	-0.016505	0.023766	-0.694484	0.4894
C(16)	0.028161	0.020234	1.391745	0.1680
C(17)	-0.157946	0.091092	-1.733916	0.0869
C(18)	-0.035128	0.077410	-0.453791	0.6512
C(19)	0.074066	0.074602	0.992812	0.3239
C(20)	-0.016699	0.102266	-0.163290	0.8707
C(21)	0.101802	0.095980	1.060662	0.2921
C(22)	-0.391255	0.033377	-11.72224	0.0000
C(23)	0.353026	0.035976	9.812887	0.0000
C(24)	-0.026406	0.023013	-1.147449	0.2547
C(25)	-0.003366	0.021337	-0.157762	0.8751
C(26)	-0.073567	0.021595	-3.406669	0.0010
C(27)	-0.091627	0.020617	-4.444242	0.0000
C(28)	-0.057154	0.020894	-2.735446	0.0077
R-squared	0.893346	Mean dependent var	0.024521	
Adjusted R-squared	0.856427	S.D. dependent var	0.050487	
S.E. of regression	0.019130	Akaike info criterion	-4.853530	
Sum squared resid	0.028545	Schwarz criterion	-4.149980	
Log likelihood	285.2371	Hannan-Quinn criter.	-4.568378	
Durbin-Watson stat	1.648120			

Continuing with the residuals diagnosis, the next analysis consisted of three parts: a) an autocorrelation test, b) a heteroscedasticity test, and c) a normality test.

Table 9 shows the Breusch-Godfrey autocorrelation test with five lags, in which the probability is 15.10% higher than the required 5%. The null hypothesis was not rejected so that we discarded serial correlation in the residuals.

Table 9. Breusch-Godfrey Serial Correlation L.M. Test

F-statistic	1.207533	Prob. F(5,73)	0.3142
Obs*R-squared	8.097310	Prob. Chi-Square(5)	0.1510

The Breusch-Pagan Godfrey test was performed to analyze heteroskedasticity in residuals. Since the L.M. statistic is greater than the 5% required, the null hypothesis of homokedasticity was not rejected.

Table 10. Breusch-Pagan-Godfrey Heterokedasticity Test

F-statistic	0.743032	Prob. F(31,74)	0.8198
Obs*R-squared	25.16235	Prob. Chi-Square(31)	0.7604
Scaled explained SS	13.62014	Prob. Chi-Square(31)	0.9971

Next, the normality test of residuals reached a value of 0.86 for the Jarque-Bera coefficient with a probability of 0.650. Then, normality in the residuals under the null hypothesis was not rejected.

Once the correct estimation of the model was verified, a cumulative sum control chart test was conducted to confirm that the model was stable, shown in Figure 2.

Figure 2. CUSUM Stability Test

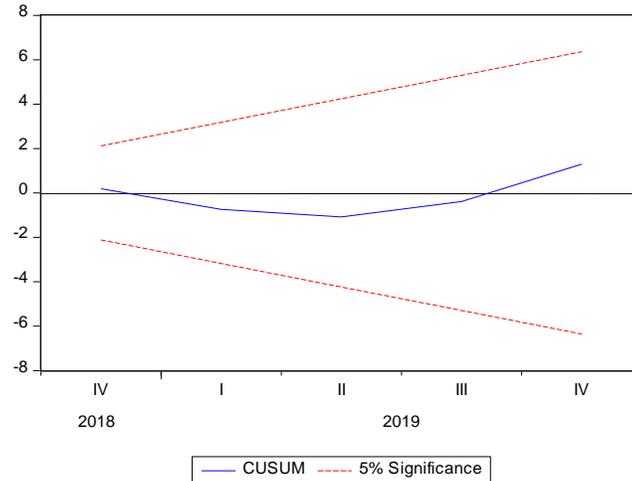


Table 11 shows the aggregated effects of the lags of the independent variables, and these aggregated effects, standard errors, and t-statistics appear in Table VI.7.

Table 11. The cumulative effect on the growth of GDP

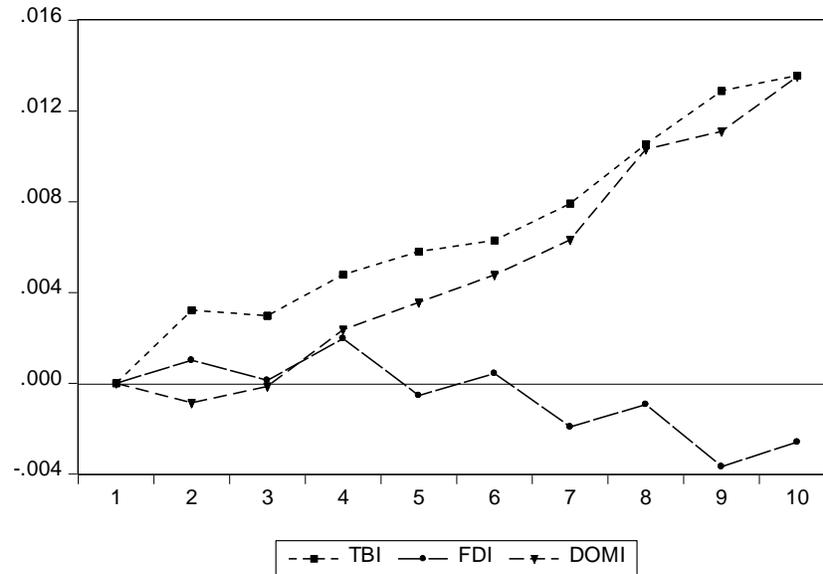
	Sum of lag coefficients	Standard error of the sum*	"t"
$\sum_{i=1}^5 \Delta gdp_{t-i}$	1.1144	0.2761	4.0370
$\sum_{i=1}^5 \Delta tbi_{t-i}$	-0.1607	0.0809	-1.9858
$\sum_{i=1}^5 \Delta fdi_{t-i}$	0.0896	0.0452	1.9805
$\sum_{i=1}^5 \Delta domi_{t-i}$	-0.0339	0.1988	-0.1705

* The standard error of the sum was calculated, adding the square of the respective standard errors of every lagged variable that appear in Table VI.4, and extracting root squared to the of the sum. $SE = \sqrt{s_1^2 + s_2^2 + s_3^2}$.

Table 11 shows the aggregated effects of the lags of the independent variables: short-term causalities we found. The cumulative effect of *gdp* and *fdi* is positive and significant, but negative in the case of *tdi*. Finally, no significant short-term causality from domestic investment to *gdp* was found. To understand the short run and log run effects of a shock on the independent variables to *gdp*, the impulse response functions were used to characterize the

reaction of the dynamic system in response to a standard deviation shock in the value of each independent variable. These are given in Figure 3

Figure 3. Response of GDP to innovations using Cholesky (d.f. adjusted) Factors



Shocks to *TBI* and *DOMI* noticeably impact *GDP* in a positive way both in the short and long run. A shock to *FDI* has an initial positive impact on *GDP*, but the response declines from 5th period onwards.

Analysis of the Results

Once the VEC model were estimated and the assumptions of the model were checked, the coefficients of the variables of the model were analyzed.

$$gdp_{t-1} = 2.5 + 0.6tbi_{t-1} - 0.17fdi_{t-1} + 0.9domi_{t-1}$$

It is possible to see that the balance of trade related positively to GDP growth, in accordance with the mercantilist approach. The inclusion of both foreign and domestic investment allowed us to discuss the mechanism through which the commercial balance has created economic growth in China. Since FDI is negatively correlated with economic growth, while the effect of domestic investment is positive and strong, the model favors the financial mercantilism approach or, more generally, the developmentalist approach. This analysis does not discard strategic effects of FDI through, for instance, imports of technology.

Conclusions

The analysis of the data conducted allowed us to shed some light on the dynamic relationship among the balance of trade, the FDI, the national investment, and economic growth for the Chinese economy, which, in addition to its global importance, has consolidated an alternative model. In line with the developmental approach, China has established a lasting positive balance of trade. It is evident that this was not the main objective of its economic

policy, but an additional element within a broad set of measures –which are difficult to capture in a quantitative estimation– aimed at improving the population's living conditions via economic growth.

We found a long-term positive effect of the trade and the national investment on economic growth. However, any significant effect of FDI on economic growth at the national level was observed; to be precise, a non-significant negative relationship was found. We consider that these results are compatible with the positive effects identified at the provincial level in the literature, due to the difference in the relative importance of FDI, with respect to the economy, for each of the two approaches. In fact, a positive short-term effect of FDI on economic growth was detected, which goes in the same direction as the provincial effect.

The positive effects of the balance of trade on GDP growth are not considered to be due to a greater attraction of FDI. The effect makes theoretical sense, but this dynamic does not seem to be predominant for the Chinese case. Consequently, we consider that the positive relationship between commercial balance and economic growth in China did not occur solely through a mechanism that focuses on attracting FDI. This is why we do not consider the monetarist mercantilist thesis to be dominant. A financial mercantilist explanation, in which the resources obtained through the consolidation of a positive commercial balance are employed to increase national investment, seems more adequate. A more general consideration that includes the achievement of a positive commercial balance as one more of the characteristics of a Developmental State cannot be discarded.

The dynamic relationship that we have found cannot be generalized to any country or time. As we have aforementioned, the consolidation of a positive commercial balance depends not only on the economic policy of a country but also on its trading partners. Furthermore, its positive impact on economic growth would depend on the economic model that is being adopted in the country.

In our opinion, the monetarist mercantilism approach through attracting FDI is, also, less consistent with the overall conception of mercantilism as it was shaped from the 16th to the 18th centuries. Mercantilism, as a comprehensive set of economic policies, seeks to empower the State, both with respect to subnational power and in the international arena. The consecution of a trade surplus implies an increase on savings, which materializes in accumulating precious metals, but also acquiring mobile capital (see Heckscher, pp-185-216). Investing increasingly in the country's productive capacities, then and now, means improving its productive capacity and it is directly related to a positive balance of trade.

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