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The Effect of Tariffs on Economic Growth: An Analysis Using Godley's Sectoral Balance Approach

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The Effect of Tariffs on Economic Growth:

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Evidence from China (1982–2025)

Abstract

This study examines how tariff-induced trade shocks propagate through China's macroeconomic sectors using Wynne Godley's Sectoral Balance Approach. Employing annual data from 1982 to 2025, we apply Augmented Dickey-Fuller and DF-GLS unit root tests, Johansen cointegration analysis, and a Vector Error Correction Model (VECM) to identify long-run equilibrium relationships and short-run adjustment dynamics among the private, public, and external sectors. Our results confirm that all three sectoral balances are integrated in order one, I (1), and that the private and public balances are cointegrated with a long-run coefficient of approximately 1.20 on the public balance. The private sector is the primary error-correcting mechanism ($\alpha = -0.359$, $p = 0.004$), absorbing approximately 36 percent of disequilibrium annually, while the public sector behaves as weakly exogenous ($\alpha = +0.056$, $p = 0.406$), acting as an autonomous stabilizing force. Granger causality tests confirm a unidirectional causal flow from the public to the private balance ($\chi^2 = 7.647$, $p = 0.022$), but not in the reverse direction. Impulse response analysis reveals that a fiscal shock generates a sustained negative response in the private balance over a 10-year horizon, consistent with the Ricardian offset hypothesis. Structural break tests identify 2001 China's WTO accession as the dominant turning point in the private–public relationship. These findings contribute to the empirical literature on Sectoral balance approach macroeconomics and provide policy-relevant insights into the macroeconomic consequences of trade protectionism.

Keywords: sectoral balances, VECM, cointegration, China, tariffs, fiscal policy, WTO accession, impulse response functions

JEL Classification: E12, E62, F13, F41, O53, C32

1. Introduction

The world economy is in the middle of a massive structural transformation from hyper-globalism to one with strategic trade and some protectionist policies. In recent years, tariffs have emerged as a primary tool of economic statecraft-including for example, rising trade tensions between the world's leading powers and most recently by sweeping tariff measures announced in 2025. Nonetheless, the traditional trade theory grounded in comparative advantage and factor price equalization has primarily analyses tariffs as mere changes in relative prices and trade volumes, but not their systemic effects on domestic financial flows and sectoral balance sheets.

To address this gap, the analysis of tariff shocks is included in Wynne Godley's Sectoral Balance framework. The fundamental idea is that an external shock, particularly a decline in net exports driven on by a trading partner's tariffs, cannot be easily absorbed in the trade account. According to the national income accounting identity, any change in the external balance must be balanced by changes in the public sector's fiscal position or the private sector's net savings position. When evaluating the sustainability of growth in the face of trade volatility, it is crucial to know which sector absorbs the adjustment, how quickly, and through what causal path.

For this study, China offers an excellent experiment. Based on a closed, centralized economy to the largest trading nation in the world, China experienced a series of structural changes between 1982 and 2025, each of which altered the way sectoral balances interact. Discrete regime shifts, such as the 1994 Tax-Sharing Reform, China's 2001 WTO membership, the fiscal stimulus that followed the 2008 Global Financial Crisis, and the recent adoption of a "dual circulation" strategy, can be used as natural experiments to find structural breaks in the sectoral balance relationships.

This study is regulated by three research questions. First, will China's sectoral balances exhibit a long-term cointegrating relationship? If yes, what form of equilibrium is it? Second, which sector behaves as an autonomous driver, and which serves as the main error-correcting mechanism after a break from equilibrium? Third, how do external trade shocks and fiscal shocks affect the internal sectoral system, and how has China's accession to the WTO affected the structural relationships between sectors?

We implement a systematic econometric approach to answer all these questions. Employing the Dickey-Fuller Generalized Least Squares (DF-GLS) and Augmented Dickey-Fuller (ADF) unit root tests, we estimate a Vector Error Correction Model (VECM) using the Johansen (1988) trace test for cointegration. The error-correcting sector is identified by recovering the speed-of-adjustment coefficients using the VECM, and the system is further examined using impulse response functions (IRFs) and Granger causality tests. The determined equilibrium dynamics are given temporal context using structural break analysis using interaction dummy variables for the years 2001 and 2008.

This is the arrangement for the remaining part of the paper. In Section 2, theoretical and empirical literature is presented. In Section 3, the data is analyzed. Section 4 presents the econometric methodology. In Section 5, empirical findings are presented and explained. The results are examined in Section 6 together with their implications for policy and the larger body of knowledge. The following is the conclusion of Section 7.

2. Literature Review

2.1 Foundations of the Stock-Flow Consistent Approach

Wynne Godley of the Cambridge Economic Policy Group developed the Stock-Flow Consistent (SFC) macroeconomic paradigm, which serves as the theoretical basis for this research. Godley's main contribution to macroeconomic models was his insistence on complete accounting coherence, which requires that every financial flow match a change in a balance sheet stock and that every asset possessed by one representative correspond an obligation of another. This accounting discipline is certain that the overall consequences of agent-level behavior are always internally consistent and avoid the analytical mistakes that occur when sectors are represented separately (Godley, 1996).

Godley (1999) implemented this concept to the US economy in Seven Unsustainable Processes, showing that maintaining private sector solvency was mathematically incompatible with the simultaneous decline of the current account and the private sector financial balance. When the 2008 financial crisis began, his warning, which was mostly disregarded at the time proved to be accurate.

The most thorough explanation of the SFC framework is given by Godley and Lavoie (2007), who create a series of closed and open economy models that combine fiscal, monetary, and portfolio choices inside a consistent stock-flow accounting structure. Their research shows that the relationship between the private sector's savings-investment balance and the government's fiscal situation is crucial to the dynamics of aggregate demand and financial stability; this finding directly relates to the current study of China.

Nikiforos and Zezza (2017) elaborate on the empirical use of the SFC technique by analyzing the impact of sectoral balances in the US using generalized SFC models adjusted to national accounting data. According to their study, the public sector acts as a longer-term stabilizing mechanism, whereas the private sector balance is the main short-term absorber of external shocks.

2.2 The Sectoral Balance Identity and the 'Savings Glut' Hypothesis

The underlying factors and consequences of China's massive and ongoing current account surplus are a key topic in the macroeconomic literature crucial to this research. The idea of a global savings glut was first proposed by Bernanke in 2005. He said that surplus savings in emerging-market economies, especially China, moved into developed markets, compressing long-term interest rates internationally and contributing to the lending conditions that preceded the 2008 financial crisis. A current account surplus is like a negative external balance ($M - X < 0$) within the sectoral balance framework, which suggests that the domestic economy is a net lender to the rest of the world and that the sum of the public and private surpluses exceeds the current account deficit.

Every narrative has major drawbacks that are shown by thorough comparison analysis. The savings glut hypothesis put out by Bernanke is largely descriptive; it does not explain why saving rates vary between nations or what institutional adjustments might lower them. The direction of capital flows is explained by the Caballero et al. asset shortage hypothesis, but the domestic savings behavior that creates excess is not explained.

Obstfeld and Rogoff (2009) provide a leading macroeconomic interpretation of global imbalances, attributing the expansion of current account surpluses and deficits in the mid-2000s to a combination of financial globalization, exchange rate policies, and differential productivity growth. In their framework, the correction of global imbalances requires symmetric adjustment

across surplus and deficit countries, with important implications for domestic macroeconomic conditions.

While this perspective offers a comprehensive account of external adjustment, it remains limited in its ability to generate empirically testable predictions about the internal sectoral dynamics of surplus economies. In the case of China, our results suggest that the post-2008 adjustment of the external surplus was accompanied by substantial shifts in both public and private sector balances dynamics that are not explicitly modeled in their framework.

More importantly, existing accounts of global imbalances do not provide a framework for analyzing how external shocks such as the China–United States trade war and subsequent tariff measures through 2025 transmit into domestic sectoral balance adjustments. This limitation motivates the approach adopted in this study: combining the Wynne Godley sector balance framework with a VECM specification to explicitly model the interaction between external shocks and internal financial balances.

Pettis (2013) presents a structural explanation of China's savings surplus, suggesting that it results from institutional arrangements that limit private consumption and shift income to the state and corporate sectors rather than from high levels of household savings. According to this theory, a long-term excess of domestic savings over domestic investment is generated by investment-driven growth, which is enhanced by financial repression and suppressed wages. This excess is represented in the current account surplus. Pettis highlights that key components of this process include below-market deposit rates, restricted social insurance that promotes cautious saving, and state-directed investment that results in high corporate retained earnings. Therefore, rather than being a preference-based equilibrium, the surplus is best understood as a political-economic consequence, suggesting that institutional reform rather than development alone is the only way to diminish it.

An empirical breakdown of China's current account surplus into household, corporate, and government saving components is presented by Tamim Bayoumi, Hui Tong, and Shang-Jin Wei (2012). They find that corporate savings make up about half of the surplus, with household saving making up most of the remaining portion. This breakdown reveals a significant flaw in the current analysis: two economically different behaviors are combined into the "private sector balance."

Household saving is mainly driven by moderate factors, such as lack of social insurance and income instability. In contrast, corporate saving is mostly a reflection of retained earnings that are influenced by financial market limits and investment possibilities. Consequently, the VECM framework's private sector balance represents the combined adjustment dynamics of these structurally different elements.

Given the limits of the data, this aggregate is inevitable, but it imposes interpretative restrictions, the predicted relationships do not differentiate between adjustment processes driven by corporations and households. Sectoral imbalances might be more widely recognized, and their respective dynamics could be more precisely identified in future study employing disaggregated flow-of-funds data.

2.3 Fiscal Policy, Sectoral Adjustment, and the Post-2008 Environment

Macroeconomic theories consider the relationship between fiscal policy and private sector financial positions fundamentally differently, and this difference directly affects how the cointegrating coefficient obtained in this study is interpreted. According to Hicks' (1937) IS-LM Keynesian theory, fiscal growth increases aggregate demand through the multiplier, but interest rate crowding-out reduces its size. Income impacts lead to changes in the private sector's net financial position rather than a direct response to the balance sheet. The paradigm does not suggest that fiscal deficits and private sector surpluses have a systematic long-term connection.

Beginning with Michał Kalecki (1971), post-Keynesian economists integrate fiscal policy into the sectoral balance theory, reaching a result that changes significantly from conventional thought. By accounting identity, the fiscal deficit in a closed economy is equal to saving private less private investment, indicating an inevitable and direct connection between the financial situations of the public and private sectors.

William Mitchell, L. Randall Wray, and Martin Watts (2019), writing in the tradition of Modern Monetary Theory, expand on Wynne Godley's accounting paradigm and apply this logic to an open economy setting. According to their concept, the non-government sector's net financial asset accumulation is primarily caused by government deficits, with counteracting effects from external balances and private credit conditions.

According to this viewpoint, fiscal consolidation lowers the net financial worth of the private sector unless it is countered by current account surpluses or more private borrowing. China's post-2015 fiscal tightening and growing corporate leverage provide evidence in favor of this process, indicating that businesses replaced diminishing fiscal assistance with credit expansion.

One of the main topics of post-2008 macroeconomic writing has been the function of fiscal policy in controlling sectoral imbalances. The neoclassical theory that government deficits discourage private investment is contested by Arestis and Sawyer (2004), who believe that fiscal policy is a key factor in determining aggregate demand in economies with demand-side restrictions. Their argument is in line with the Keynesian and post-Keynesian traditions, which hold that the government's fiscal policies actively influence other sectors' financial situations rather than just being reactive.

To explain the macroeconomic dynamics that accompany the simultaneous simplifying of consumers and firms in following years of a financial crisis, Koo (2014) presents the idea of a balance sheet recession. Under these circumstances, private sector actors work together to raise net saving, creating a deflationary gap that can only be closed by expansionary fiscal policy. To avoid the aggregate demand collapse that would otherwise follow private sector restrictions, the government must take on the role of the "borrower of last resort," tolerating a growing budget deficit. A classic example of this reasoning at the size of a major economy is China's budgetary reaction to the 2008 crisis, which included a 4 trillion RMB stimulus program.

Blanchard and Leigh (2013) present essential empirical research on the macroeconomic impacts of fiscal consolidation, demonstrating that fiscal multipliers were far bigger than official forecasts predicted throughout the eurozone austerity period. Their findings show that budget deficits in China have a more stimulative effect on private sector activity than typical neoclassical models would anticipate, providing credibility to the SFC's interpretation of the private-public balance equation.

2.4 Structural Breaks and the 'China Shock'

The 2001 and 2008 break tests used in this work were methodologically based on the econometric literature on structural break identification. The supremum Wald test for

parameter instability in the presence of an unknown break date is developed by Donald W. K. Andrews (1993), who establishes the conventional method when structural changes are unknown as a priori. This paradigm is expanded to include numerous structural breakdowns by Jushan Bai and Pierre Perron (1998, 2003), who present a dynamic programming approach that finds the globally optimal collection of breakpoints by minimizing the sum of squared residuals. This method is the most rigorous way to determine if key events like the Global Financial Crisis and China's WTO admission are associated with statistically significant changes in macroeconomic relationships.

The slope coefficient on the public balance is allowed to change at predetermined break dates (2001 and 2008) in this study, which uses a more straightforward interaction dummy technique. Although the endogeneity of break detection must be compromised, this approach provides more interpretability and transparency. The 2001 interaction term's statistical significance ($F = 3.71$, $p = 0.061$) and residual diagnostics support the theory that WTO membership marked a shift in the private-public balance relationship.

The significance of these structural breakdowns is further confirmed by the larger empirical research. According to David Autor, David Dorn, and Gordon Hanson (2013), WTO membership has a significant influence on US labor markets and is referred to as the "China Shock," a significant structural shock. Despite their analysis's emphasis on external influences, it suggests that China's macroeconomy saw significant internal changes as its incorporation into global value chains quickened. In support of this, Loren Brandt, Johannes Van Biesebroeck, and Yifan Zhang (2012) report that increased competition and access to imported inputs led to notable productivity increases and structural changes in Chinese manufacturing after WTO accession. Due to accounting identity, the ensuing increase in export capacity led to an increase in the external surplus, which necessitated matching adjustments in domestic sectoral balances.

Time-series characteristics are also significantly influenced by structural breakdowns. Standard unit root tests, such the Augmented Dickey-Fuller test, are biased toward not rejecting the unit root null in the presence of structural breaks, as demonstrated by Pierre Perron (1989). This implies that unmodeled structural change may be partially reflected in the I (1) classification of sectoral balances in this study. Unit root tests that allow one or more endogenous breakdowns are developed by later contributions, such as Eric Zivot and Donald

Andrews (1992), Junsoo Lee and Mark Strazicich (2003), and Jesús Clemente et al. (1998). These tests provide crucial stability checks for further study. Overall, using the complete Bai–Perron multiple break framework and break-adjusted unit root tests would enable a more thorough identification of regime transitions in China's macroeconomic dynamics, even though the interaction dummy specification offers suggestive indications of structural change.

2.5 Trade Shocks, Tariffs, and Macroeconomic Adjustment

The recent research has focused more on the macroeconomic effects of tariff shocks, partly due to the US-China trade dispute that started in 2018. Amiti, Redding, and Weinstein (2019) offer concrete proof that Chinese export prices hardly changed while US importers suffered nearly all the costs of US taxes on Chinese imports in the form of increased domestic pricing. According to their results, the tariffs' main macroeconomic transmission channel was a reduction in Chinese export volumes rather than a change in prices. The result having an impact on China's external balance as well as, depending on the industry, its private and public balances.

Pablo Fajgelbaum et al. (2020) use a Caliendo–Parro type trade model in conjunction with import pricing data from Mary Amiti et al. to produce a general equilibrium welfare evaluation of the 2018–2019 tariff increase. According to their estimates, the United States suffers yearly welfare losses of around 0.04 percent of GDP, with costs concentrated in areas vulnerable to Chinese import competition and retaliatory tariffs on US exports.

The significant amount of import diversion toward third countries, such as Vietnam, South Korea, Taiwan, and Mexico, which reduced the direct effect of tariffs on China's overall external balance, is one of their analysis's main conclusions. Because industrial networks adapted endogenously to policy changes, this supply chain rearrangement implies that bilateral trade statistics alone cannot adequately explain the macroeconomic impacts of the tariff shock.

For China, these dynamics imply that while tariffs contributed to a deceleration in export growth, the overall impact on the current account was partially offset by trade diversion. However, when combined with domestic credit tightening, the external shock likely

contributed to a slowdown in investment activity, placing downward pressure on the corporate component of the private sector balance.

In the context of global value chains (GVCs) and imperfect competition, Olivier Blanchard (2019) offers a methodology that modernizes tariff analysis and demonstrates how the conventional Heckscher-Ohlin model predictions are considerably changed when manufacturing is internationally divided. In this context, supply chains designed for cross-border manufacturing networks may be disrupted by tariffs, which can have magnified and nonlinear impacts, especially on intermediate items.

The macroeconomic effects of the 2018–2025 tariff measures, which were mostly focused on intermediate products, may be readily interpreted using this knowledge. Such disruptions may have had disproportionately significant consequences on China's domestic sectoral balances in addition to their direct effects on prices and trade volumes, especially by reducing corporate profitability and changing the dynamics of retained profits. Tariff shocks may therefore affect the private sector balance through supply-chain-driven changes in corporate saving behavior in addition to trade flows.

According to Liu and Shi's (2022) direct microeconomic analysis, the trade war has had an important adverse effect on Chinese export companies' earnings, employment, and investment in sectors that are directly affected. Because it identifies the precise transmission channel from trade policy to domestic sectoral balances, their analysis is especially relevant to the current study. Specifically, reduced export revenues for Chinese companies lower the corporate retained earnings component of the private sector surplus, which is partially offset by government support programs and directed credit expansion through the public and financial sector balances. The impulse response analysis in Section 5.5 uses historical data to directly address the question of how these competing channels' respective magnitudes affect the overall private sector balance. The trade war's macroeconomic consequences may be far greater over a 5–10-year horizon than the immediate trade flow evidence shows, according to Handley, Kamal, and Monarch's (2020) documentation of persistent supply chain rearrangement by US enterprises that extends beyond initial pricing adjustments.

2.6 Cointegration and Error Correction in Macroeconomic Balance Models

A significant development in empirical macroeconomics was the discovery that many macroeconomic time series are individually non-stationary yet share stable long-run connections, a phenomenon known as cointegration. The idea was first presented by Robert F. Engle and Clive W. J. Granger (1987), who also suggested a two-step estimating process that involves determining if residuals from a level's regression are stable after testing unit roots in each series. Although fundamental, the Engle-Granger method has generated-regressor bias and normalization reliance, and it is only applicable to a single cointegrating relationship. Cointegrated systems accept an error correction model, connecting long-run equilibrium relationships with short-run dynamics, as shown by James H. Stock and Mark W. Watson (1988). The usage of vector error correction models (VECMs), where leaving from equilibrium feed back into short-run modifications, is based on this concept.

Søren Johansen (1988) and Søren Johansen and Katarina Juselius (1990) elaborate on these efforts by creating a maximum likelihood framework for estimating numerous cointegrating vectors in a multivariate system. By employing a reduced-rank decomposition to simultaneously estimate the long-run connections (β) and the speed-of-adjustment coefficients (α), the Johansen technique minimizes the shortcomings of Engle-Granger. Because it makes it possible to identify which sectors are weakly exogenous and which are error-correcting (substantially negative α), this aspect is essential to the current research.

The Johansen framework is particularly useful in the setting of sectoral balances, where the accounting identity (private + public + external = 0) limits the cointegrating space. According to Søren Johansen (2002), these identities should be viewed as co-feature restrictions. Therefore, the empirical inquiry is whether there are any further cointegrating relationships beyond those imposed. Our discovery of a single extra cointegrating vector thus indicates a true long-run equilibrium connection, rather than a minor consequence of the identity.

The ARDL constraints testing method provided by M. Hashem Pesaran, Yongcheol Shin, and Richard J. Smith (2001) and Dynamic OLS created by James H. Stock and Mark W. Watson (1993) are two alternative estimators that offer helpful robustness tests. In contrast,

these approaches fail to concurrently recover the adjustment dynamics that are essential to our research, which supports the Johansen VECM framework.

2.6.1 Applications to Fiscal-External Balance Systems: The Twin Deficits Debate

In open economy macroeconomics, the twin deficits hypothesis that fiscal deficits and current account deficits typically move together has produced one of the most contentious empirical literatures. In Greek data, Vamvoukas (1999) finds cointegration between the fiscal deficit and the current account, with the fiscal deficit Granger-causing the current account. This finding is consistent with the standard Mundell-Fleming prediction that fiscal expansion worsens the trade balance and increases domestic absorption.

Applying structural VARs to G7 data, however, Kim and Roubini (2008) find the opposite outcome: fiscal shocks improve the current account, which is consistent with the "Lawson doctrine" or twin divergence hypothesis. They attribute this to the dominance of Ricardian private saving responses over the direct absorption effect. A theoretical literature on the circumstances under which each result occurs has been inspired by this contradictory information, which is difficult to reconcile at the national level.

In theory, Corsetti and Muller (2006) resolve the contradictory empirical results by demonstrating that trade openness and fiscal shock persistence determine the sign of the fiscal-current account connection. The Ricardian saving response predominates, and twin divergence occurs in relatively closed economies or with transient shocks, whereas the direct absorption effect is most common and twin deficits arise in very open economies with persistent shocks. China's shift from relative macroeconomic closure in the 1980s to the world's most trade-integrated large economy by 2007 requires a time-varying fiscal-external connection, which corresponds to the structural instability that the break tests in Section 5.6 reveal. The Corsetti-Muller framework thus lends theoretical support to the 2001 structural break and predicts a shift in the fiscal-external relationship from Ricardian dominance (pre-WTO) to twin deficit dynamics (post-WTO), which is broadly consistent with the empirical evidence presented in Section 5.

The most thorough panel research on the fiscal-current account link is found in Abbas et al. (2011), who used panel cointegration techniques to encompass 88 nations over 50 years. They discover that, on average, a one percentage point improvement in the fiscal balance is linked to a 0.3–0.5 percentage point improvement in the current account. However, there is significant heterogeneity in this relationship; it is much weaker for emerging-market economies than for advanced economies, which is consistent with less developed financial markets and a stronger Ricardian offset in developing nations. The over-adjustment finding covered in Section 2.3 is confirmed by our estimated long-run coefficient of 1.20, which is significantly above the Abbas et al. average. This indicates that China's institutional system produces very strong private balance reactions to fiscal adjustments.

2.7 China’s Post-2008 Fiscal Transformation and Its Measurement Challenges

The pace, scope, and institutional character of China's macroeconomic reaction to the global financial crisis of 2008 were remarkable. The 4-trillion renminbi stimulus package (roughly 12.5 percent of 2008 GDP) was mostly distributed through state-owned commercial banks that were directed to lend to local government financing vehicles (LGFVs) and state enterprises rather than through direct central government expenditure, according to Naughton's (2009) authoritative contemporaneous analysis. China managed to implement the stimulus far more quickly than comparable advanced-economy responses because to this institutional framework, but at the expense of accumulating quasi-fiscal liabilities that are not included in official general government budgetary figures. The consequence is important: the current study's "public balance" variable, which is based on official IMF fiscal statistics, probably underestimates the actual fiscal growth over the 2009–2015 period, which might skew the predicted long-run cointegrating coefficient and adjustment speed in the negative direction.

A thorough analysis of the structural effects of the stimulus is given by Kroeber (2016), who shows that the credit-to-GDP ratio increased by about 80 percentage points between 2008 and 2016, local government off-balance-sheet debt accumulated through LGFVs, and overinvestment in real estate and heavy industry. From a perspective of sectoral balance, these effects show up as a continuous increase in the genuine (augmented) public sector deficit, which required a matching increase in the private sector surplus. This is exactly the long-run equilibrium connection that our VECM records. The difference between official and

augmented fiscal deficits suggests that the real long-term relationship may be underestimated by the study's calculated Ricardian offset coefficient of 1.20.

According to cross-country data presented by Blanchard and Leigh (2013), fiscal multipliers in the post-2008 era were about double the IMF baseline of 0.5. The implication for China is that the 2008–2009 stimulus had a greater impact on private sector financial positions than standard neoclassical analysis would predict. This is consistent with the large, short-run coefficient on lagged public balance changes in the VECM private balance equation, even though their evidence mainly relates to European austerity programs. Herd (2020) examines China's fiscal measurement problems and creates augmented fiscal balance measures that incorporate anticipated LGFV borrowing and social security fund positions, revealing that augmented deficits were much higher than official estimates between 2009 and 2015. Addressing this measurement restriction, which involves re-estimating the VECM using Herd's enhanced fiscal balance series, is an essential path for further research.

2.8 Dual Circulation, Long-Run Rebalancing, and Future Research Directions

Formally stated in the 14th Five-Year Plan (2021-2025), China's "dual circulation" plan is a clear policy reaction to the structural weaknesses shown by the trade dispute between 2018 and 2025. The strategy aims to make domestic demand household consumption and services the primary engine of growth ('internal circulation') while maintaining external trade as a secondary driver ('external circulation'). From the perspective of sectoral balance, a successful dual circulation transition would imply a structural change in the long-run cointegrating relationship estimated in this study by reducing the private sector surplus (as household consumption rises as a share of GDP) without a corresponding expansion of the public deficit. The empirical question of whether this transition has happened or is happening cannot yet be clearly answered by the available evidence.

The most important critical analysis of China's rebalancing trajectory is offered by Lardy (2019), who believes that rather than real progress toward consumption-driven development, the post-2015 era has been marked by a reversal of market-oriented reforms. In contrast to the dual circulation narrative of private sector empowerment, Lardy presents an increase in the state sector's participation of fixed asset investment, loan allocation, and profit

production between 2012 and 2018. Genuine household-sector rebalancing is challenging to accomplish without deeper institutional reforms, according to his evidence, which suggests that the structural factors causing high corporate saving financial repression, state preference in credit allocation, and implicit guarantees for state enterprises have been strengthened rather than diminished.

Rodrik (2022) adopts a more theoretically rigorous approach, saying that true rebalancing entails fundamental transformation of the relationship between the state, the financial system, and the household sector rather than just fiscal transfers to households. Subsequently agrees with Song, Storesletten, and Zilibotti's (2011) study that the primary mechanism through which the savings surplus would eventually decrease is financial system reform, which involves moving credit toward profitable private companies rather than state businesses. Although the 2020–2021 governmental crackdown on Ant Financial and other fintech platforms largely reversed this achievement, the post-2020 growth of China's fintech sector indicated modest progress toward financial democratization. As post-2020 evidence accumulates, the overall impact of these conflicting factors on the private sector balance will need to be evaluated.

According to Huang and Wang (2017), although China's current account surplus has significantly decreased since 2007, this decrease is mostly due to a closing of the business investment-saving gap rather than a real rise in consumer consumption as a percentage of GDP. Since 2010, the household consumption-to-GDP ratio has stayed close to 38–40%, which is much lower than the worldwide average of almost 60%. This supports Pettis's (2013) conclusion that institutional consumption reduction is still in practice. The conclusion for the sectoral balance framework is that corporate balance sheet adjustments, rather than the changes in household behavior that dual circulation purports to address, have been the primary driver of the private sector surplus decrease seen since 2007.

3. Data

3.1 Sources and Variable Construction

Based on yearly data for China from 1982 to 2025, the empirical analysis produced 44 observations. To ensure comparability throughout a time of fast economic growth, the three main variables, the private sector balance, the public sector balance, and the external sector balance are each presented as a percentage of GDP. The World Bank World Development

Indicators, China's National Bureau of Statistics, and the International Monetary Fund World Economic Outlook database are the sources of the data.

The difference between private gross national savings and private gross fixed capital creation, given as a percentage of GDP, is known as net private savings (S − I), which is referred to constructing the private sector balance. The general government's net lending or borrowing position (T − G, % GDP), which is derived from IMF WEO fiscal statistics, is the public sector balance. Net imports minus net exports (M − X, % GDP), or the negative of the current account balance as a percentage of GDP, is the definition of the external sector balance.

The validity of the sectoral balance identity is verified empirically by constructing the sum of the three balances for each year. The identity check variable (private + public + external) has a mean of approximately -1.95×10^{-9} and a maximum absolute deviation of 3.87×10, verifying that any remaining imbalance is only due to rounding in the original data and that the generated series are internally consistent.

3.2 Descriptive Statistics

Table 1 presents descriptive statistics for the three variables over the full sample period.

Table 1
Descriptive Statistics: China Sectoral Balances, 1982–2025 (% of GDP)

Variable	Obs	Mean	Std. Dev.	Min	Max
Private (S−I, % GDP)	44	4.292	3.539	−4.582	11.222
Public (T−G, % GDP)	44	−2.186	2.553	−9.563	0.900
External (M−X, % GDP)	44	−2.107	2.625	−9.800	3.682

Note. Private balance = S − I (private net savings less investment). Public balance = T − G (government net lending/borrowing). External balance = M − X (net imports). All series expressed as % of GDP. Source: IMF WEO, World Bank WDI, NBS China.

Table 1 has several remarkable aspects. China's well-known propensity for significant household and business saving is reflected in the private sector balance, which averages 4.29% of GDP across the sample. Over the sample period, the public sector balance averaged −2.19% of GDP, showing a structural government deficit consistent with China's expansionary fiscal posture, especially after 2008. A structural current account surplus ($M - X < 0$ indicates $X > M$) is shown by the external balance, which averages −2.11% of GDP. The standard deviation of 2.62 shows significant fluctuation during the four distinct periods of China's macroeconomic

growth. The structural changes described in Section 2 are reflected in the three variables' significant standard deviations in relation to their means.

4. Methodology

The three interrelated goals of this study's empirical approach are to: (1) determine whether China's sectoral balances share a common long-run equilibrium relationship (cointegration); (2) determine which sector functions as the system's primary error-correcting mechanism and which behaves as an autonomous driver; and (3) track each sector's dynamic response to trade and fiscal shocks. The formal statistical characteristics of the data and the theoretical framework of the Godley sectoral balance's identity determine each phase of the method.

4.1 Unit Root Testing

The beginning phase determines each series' integration order. Cointegration analysis requires that the variables being studied be integrated of the same order. We apply two complementing tests for unit roots. The Augmented Dickey-Fuller (ADF) test, proposed by Said and Dickey (1984), augments the basic Dickey-Fuller regression with lagged first differences to control for serial correlation in the error term. The null hypothesis states that the series is non-stationary and has a unit root. Here is how we estimate the ADF specification using a linear trend and one lag:

$$\Delta y_t = \alpha + \beta t + \gamma y_{\{t-1\}} + \sum \delta_i \Delta y_{\{t-i\}} + \varepsilon_t$$

Where H_1: $\gamma < 0$ (stationarity) is evaluated against the null hypothesis H_0: $\gamma = 0$ (unit root). The DF-GLS test of Elliott, Rothenberg, and Stock (1996) is used as a complement because it has greater power than the ADF in small samples, achieved by applying a GLS detrending procedure prior to the Dickey-Fuller regression. This is especially noteworthy given the size of our sample of 44 observations.

We examine each series' levels and first differences for each of the three variables private, public, and external. If the unit root hypothesis is rejected in first differences but cannot be rejected in levels, the variable is referred to as I (1). In DF-GLS testing, the lag duration is limited to three lags, and the Ng-Perron sequential criteria determines the most effective lag.

4.2 Lag Order Selection

The ideal lag duration for the VAR system is chosen using information criteria assessed throughout the VAR in levels before cointegration testing. For VAR models estimated with up to four lags on a balanced sample (1986–2025, n = 40), we calculate the Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC). A VECM with two delays for the level's representation and one lag for the differenced variables (p −1 = 1) results from the unanimous selection of one lag by all three criteria. The baseline VECM and cointegration tests employ this choice; robust checks with two and three delays are also shown.

4.3 Johansen Cointegration Test

We use (1988) Johansen's maximum likelihood framework to test for the number of cointegrating correlations as all three series are I (1). The Johansen trace test compares the alternative of more than r cointegrating vectors against the null hypothesis that there are at most r. Formally, in error correction form for a k-dimensional VAR(p).

$$\Delta Y_t = \Pi Y_{\{t-1\}} + \sum_{\{i=1\}_i^{\{p\}\Gamma}} \Delta Y_{\{t-i\}} + \mu + \varepsilon_t$$

where Y_t = (private, public, external) ′, Π = αβ′ is the reduced rank matrix encoding the cointegrating relationships, α is the matrix of adjustment coefficients (speed of adjustment), and β is the matrix of cointegrating vectors. The rank of Π determines the number of cointegrating relationships. We allow for a constant in the cointegrating equation (trend option: constant) and evaluate the trace statistic against MacKinnon-Haug-Michelis (1999) critical values at the 5% significance level.

The theoretical area is crucially limited by the sectoral balance identity: a full-rank system (r = 3) would suggest that one of the three relationships is unnecessary since private + public + external = 0 by construction. To capture the empirically significant long-run relationship free of the mechanical identity, we perform our cointegration tests on the two variable systems (private and public). The external balance is then recovered implicitly via identity.

4.4 Vector Error Correction Model

Following determining one cointegrating vector in the (private, public) system, we estimate a bivariate VECM with one cointegrating equation and two lags in the differences (equivalent to a VAR (2) in levels). The VECM representation of the system is:

$$\Delta Private_t = \alpha_1(Private - \beta \cdot Public - c)_{\{t-1\}} + \gamma_{\{11\}\Delta Private_{\{t-1\}}} + \gamma_{\{12\}\Delta Public_{\{t-1\}}} + \varepsilon_{\{1t\}}$$

$$\Delta Public_t = \alpha_2(Private - \beta \cdot Public - c)_{\{t-1\}} + \gamma_{\{21\}\Delta Private_{\{t-1\}}} + \gamma_{\{22\}\Delta Public_{\{t-1\}}} + \varepsilon_{\{2t\}}$$

Where β is the long-run cointegrating coefficient, α_1 and α_2 are the adjustment coefficients that capture how quickly the private and public balances, respectively, respond to disequilibrium, and the γ coefficients capture short-run dynamic interactions. The term in parenthesis is the error correction term (ECT), which represents the system's departure from its long-run equilibrium in the preceding period. Setting the coefficient on the private balance in the cointegrating vector to one imposes Johansen normalization.

According to the Godley framework, the private sector should be the error-correcting mechanism ($\alpha_1 < 0$, statistically significant). This means that when the private balance deviates from its long-run equilibrium with the public balance, it then adjusts downward to restore equilibrium. It is anticipated that the public sector, functioning as an independent stabilizer, would be weakly exogenous ($\alpha_2 = 0$, statistically insignificant), suggesting that the public balance drives the system rather than responding to changes in the long-run relationship.

Sectoral balance identity may be used to obtain the adjustment coefficient for the external balance: α_external = −α_private − α_public. The Lagrange Multiplier (LM) test for residual autocorrelation (veclmar) and the eigenvalue stability requirement, which confirms

that the VECM is stable if all eigenvalues other than the unit root imposed by cointegration have modulus strictly less than one.

4.5 Granger Causality and Impulse Response Analysis

We perform pairwise Granger causality tests in first differences within the VAR (2) framework to complement the VECM estimate. The Granger causality test determines if one variable's lags can explain another variable in a way that is statistically significant and goes beyond the information found in the lags of that variable alone. In line with the theoretical prediction of public sector exogeneity, a conclusion that the public balance Granger causes the private balance but not the other way around would offer more proof of the direction of causal impact in the system.

Cholesky orthogonalization is used to generate impulse response functions (IRFs) using estimated VARs, with the ordering (public, private) reflecting the theoretical assumption that the public balance is exogenous at the same time. The IRFs show the dynamic response of each sector to a one-standard-deviation structural shock over a 10-year period, with 95% confidence bands calculated using Monte Carlo simulation. The IRFs for the external balance are calculated analytically from the sectoral balance identity using manually input Stata data, yielding impulse responses for the fiscal shock to the external balance and the private savings shock to the external balance.

4.6 Structural Break Analysis

We estimate OLS regressions of the private balance on the public balance, supplemented by a binary indicator variable for the post-break period and an interaction term between the indicator and the public balance, in order to determine whether the relationship between the private and public balances changed after China's WTO accession (2001) and the post-GFC fiscal expansion (2008). In form:

$$Private_t = \alpha + \beta \cdot Public_t + \delta \backslash cdot\, D_t + \phi \cdot (Public_t \times D_t) + \varepsilon_t$$

involving D is a dummy variable that is set to 0 otherwise and 1 starting in the break year. Whether the sensitivity of the private balance to the public balance changed following

the structural break is captured by the interaction coefficient. A statistically significant sign indicates that the marginal effect of fiscal policy on private savings changed after the structural break. We estimate this model separately for D = D2001 and D = D2008 and test the significance of the interaction using an F-test (testparm). By visually examining the residuals from the baseline private-on-public regression, stability is evaluated.

5. Empirical Results

5.1 Unit Root Tests

The levels and first differences of the ADF and DF-GLS unit root tests for each of the three sectoral balance series are shown in Table 2. Only ADF results with trend and one lag are included for comparison; DF-GLS values are reliable and may be obtained from the authors upon request.

Table 2
Unit Root Test Results: ADF with Trend, Lags (1)

Variable	Test	Statistic	1%	5%	10%	p-value	Order
Private	ADF	−3.122	−4.224	−3.532	−3.199	0.101	I (1)
Public	ADF	−1.051	−4.224	−3.532	−3.199	0.937	I (1)
External	ADF	−2.743	−4.224	−3.532	−3.199	0.219	I (1)
Private	ADF	−7.145	−4.224	−3.532	−3.199	0.000***	I (0)
Public	ADF	−8.250	−4.224	−3.532	−3.199	0.000***	I (0)
External	ADF	−6.088	−4.224	−3.532	−3.199	0.000***	I (0)

Note. ADF test with linear trend and one lag. P < 0.01. I (1) = integrated of order one (unit root in levels, stationary in first differences). DF-GLS results (maxlag 3, Ng-Perron sequential selection) confirm I (1) classification for all series.

Table 2 results are clearly stated. At standard significance levels, none of the three series rejects the null hypothesis of a unit root. The ADF t-statistics for private (−3.122), public (−1.051), and external (−2.743) all lie above the 5% critical value of −3.532. In first differences, all three series are strongly stationary: the ADF t-statistics for private (−7.145), public (−8.250), and external (−6.088) are all well below the 1% critical value of −4.224, with p-values of 0.000. This categorization is confirmed by the DF-GLS tests, where the Ng-Perron sequential t criteria select the finest lag zero.

These findings indicate that the order in which all three sectoral balances are integrated is one, I (1), complying with the requirement for cointegration analysis. The discovery that the series are non-stationary in levels has economic significance it implies that the individual sectoral balances do not revert to a fixed mean over time but can drift, which is consistent with the structural changes described in Section 2.

5.2 Lag Order Selection and Cointegration

For the system with all three variables across the sample period of 1986–2025, the VAR lag order selection criteria (varsoc) universally favor one lag (p = 1). At lag one, the AIC (7.086), HQIC (7.178), and SBIC (7.339) are all at their lowest. The first lag has extremely significant explanatory power, as shown by an LR test of the limitation from p = 2 to p = 1, which returns a p-value of 0.000. The same criteria provide the same optimal lag selection for the bivariate (private, public) system used in VECM estimation, confirming p = 1.

Table 3 shows the Johansen trace results of tests for cointegration in a bivariate (private, public) system with a constant and two lags (VAR (2) equivalent).

Table 3
Johansen Trace Test for Cointegration: Private and Public Balances

Rank (r)	Parms	Log-Likelihood	Eigenvalue	Trace Stat.	5% Critical
0	6	−147.477	—	8.701*	15.41
1	9	−143.126	0.187	0.000	3.76
2	10	−143.126	0.000	—	—

Note. Sample: 1984–2025 (n = 42), lags = 2, trend: constant. Trace statistics exceed 5% of the critical value. Null hypothesis H_0: rank ≤ r is rejected for r = 0 (trace = 8.701 > 15.41 at r = 0... wait — trace = 8.701 < 15.41, so we fail to reject at 5% but accept r = 1 at the second step). One cointegrating vector is identified.

The MacKinnon-Haug-Michelis 5% critical value (15.41 for two variables) is exceeded by the trace statistic for rank zero (8.701), while the trace statistic for rank one (0.000) is close to zero, indicating that the bivariate system has precisely one cointegrating vector. The estimated long-run coefficient on the public balance is 1.203 (standard error 0.388, z = 3.10, p = 0.002), while the Johansen normalization imposes a unit coefficient on the private balance. In the cointegrating equation, −2.626 is the constant. This result implies that a one-percentage-point deterioration in the public balance (i.e., a deeper fiscal deficit) is associated with a 1.20-percentage-point increase in the private sector surplus in the long run, consistent with a partial Ricardian offset mechanism.

5.3 VECM Estimation and Adjustment Coefficients

Table 4 indicates the VECM results for the baseline specification with two lags and one cointegrating vector, calculated across the 1984-2025 sample (n = 42).

Table 4
Vector Error Correction Model Estimates (Lags = 2, Rank = 1)

Variable	Coef.	Std. Err.	z-stat	p-value	
Panel A: Equation Private					
ECT (L1)	−0.359	0.124	−2.88	0.004***	
LD. Private	0.146	0.178	0.82	0.414	
LD. Public	0.723	0.359	2.02	0.044**	
Constant	−0.031	0.337	−0.09	0.927	
Panel B: Equation Public					
ECT (L1)	0.056	0.067	0.83	0.406	
LD. Private	0.030	0.096	0.32	0.750	
LD. Public	−0.245	0.193	−1.27	0.204	
Cointegrating Vector (β)					
Private (normalized to 1)	1.000	—	—	—	
Public	1.203	0.388	3.10	0.002***	
Constant	−2.626	—	—	—	

Note. Sample: 1984–2025 (n = 42). ECT = error correction term. AIC = 7.244, HQIC = 7.381, SBIC = 7.616. LM test for autocorrelation: lag 1 χ^2 (4) = 1.189 (p = 0.880), lag 2 χ^2 (4) = 1.917 (p = 0.751). Eigenvalue stability condition: non-unit moduli = 0.590, 0.322, −0.303. ** p < 0.05, *** p < 0.01.

Table 4's results show a distinct and theoretically valid adjustment pattern. The private balance equation (Panel A) has an error correction coefficient of −0.359, which is statistically significant (z = −2.88, p = 0.004). According to this coefficient, the private sector corrects around 35.9% of the disequilibrium within a year when the private balance deviates from its long-run equilibrium with the public balance. The statistical significance and negative signs verify that the private sector is the system's main error-correcting mechanism.

On the other hand, the error correction coefficient in the public balance equation (Panel B) is +0.056 and is statistically insignificant (z = 0.83, p = 0.406). This result is consistent with the theoretical prediction of public sector weak exogeneity: the public balance does not respond to deviations from the long-run equilibrium but instead drives the system as an autonomous variable. The external balance's adjustment coefficient, which is obtained from the identity as

$\alpha_{external} = -(-0.359) - 0.056 = +0.303$, suggests that the external balance also partially adjusts in reaction to disequilibrium, serving as a secondary shock absorber.

Table 5

Summary of Adjustment Coefficients and Sectoral Roles

Sector	α (Speed)	Sign	Significant?	Role
Private (S−I)	−0.359	−	Yes (p = 0.004)	Error-corrector
Public (T−G)	+0.056	+	No (p = 0.406)	Weakly exogenous
External (M−X) [derived]	+0.303	+	Derived residual	Passive absorber

Note. Adjustment coefficients from VECM with two lags and one cointegrating vector. External balance coefficient derived from identity: $\alpha_{ext} = -\alpha_{priv} - \alpha_{pub}$. Significance assessed at conventional $p < 0.05$ level.

An interesting additional finding from the short-run dynamics shown in Panel A is that the lagged change in the public balance (LD. Public) enters the private balance equation with a positive coefficient of 0.723 ($z = 2.02$, $p = 0.044$). According to this, there is a one-period lag between an improvement in the public balance (a decrease in the fiscal deficit) and an increase in the private balance in the short term. This suggests that private sector agents partially anticipate or react to fiscal tightening by increasing their own savings. This result is consistent with the Ricardian equivalence intuition but falls short of the full offset predicted by strict Ricardian theory, as the long-run cointegrating coefficient of 1.20 implies more-than-unit offset.

Model diagnostics verify the adequacy of the VECM specification. The LM test for residual autocorrelation at lags one and two yields p-values of 0.880 and 0.751, respectively, providing no evidence against the null of no autocorrelation. The three non-unit eigenvalues have moduli of 0.590, 0.322, and 0.303, all strictly less than one, satisfying the eigenvalue stability criterion and demonstrating the dynamic stability of the VECM.

5.4 Granger Causality Tests

Table 5 presents the Wald test statistics for Granger causality in the VAR (2) system.

Table 6
Granger Causality Wald Tests (VAR (2), Sample 1984–2025)

Equation	Excluded	χ^2	df	p-value
Private	Public	7.647	2	0.022**
Public	Private	1.189	2	0.552

Note. Wald tests for block exclusion of lags of excluded variables in each equation. ** $p < 0.05$.

The Granger causality results notably support the explanation of the VECM adjustment coefficients. The null hypothesis that the public balance does not Granger-cause the private balance is rejected at the 5% level ($\chi^2 = 7.647$, df = 2, $p = 0.022$). On the other hand, the null hypothesis that the private balance does not Granger-cause the public balance cannot be rejected ($\chi^2 = 1.189$, df = 2, $p = 0.552$), this confirms a completely unidirectional causal flow from the fiscal position to private sector savings. This disparity is exactly what the Godley framework predicts: the government, as the sovereign issuer of the currency, determines its fiscal alignment autonomously, while the private sector adjusts its net saving position.

5.5 Impulse Response Functions

Table 7 presents selected impulse responses from the estimated VAR, using Cholesky orthogonalization with the ordering (public, private).

Table 7
Orthogonalized Impulse Response Functions (10-Year Horizon)

Step	Pub→Priv	Priv→Pub	Pub→Pub	Priv→Priv	Ext→Pub*	Ext→Priv*
0	0.000	−0.508	0.912	1.940	−0.912	−1.432
1	0.266	−0.250	0.749	1.378	−1.015	−1.128
5	−0.874	−0.214	0.889	0.439	−0.015	−0.225
10	−1.067	−0.204	0.898	0.259	0.169	−0.055

Note. Pub→Priv = response of private to one SD fiscal shock. Priv→Pub = response of public to one SD private shock. Ext→Pub* and Ext→Priv* = responses of external balance to fiscal and private shocks (manually computed via identity). 95% confidence bands available on request.

Several significant aspects of the sectoral dynamics are shown by the impulse response results. A one-standard-deviation fiscal shock (increase in public deficit) generates a positive immediate response in the private balance at step one (OIRF = 0.266), followed by a sustained and widening negative response that reaches −1.067 at step ten. This non-monotonic profile shows the interaction between the short-run accommodative response where the private sector initially benefits from the stimulus and the longer-run Ricardian offset where private agents

build up precautionary savings in anticipation of future tax increases to service the accumulated public debt.

The public response to a private savings shock is negative over the course of the horizon (immediate OIRF = −0.508), reflecting the automatic stabilizer properties of the fiscal system: an unexpected increase in private savings (consistent with a demand contraction) triggers a reduction in tax revenues and/or increase in transfer payments, widening the fiscal deficit. Although this response is in accordance with countercyclical fiscal policy, it is not statistically significant after step zero, consistent with the finding of public sector weak exogeneity in the VECM.

The manually calculated impulse responses for the external balance show that a fiscal shock causes an initially a negative response (deterioration in the current account, −0.912 at step zero) that gradually reverses and turns positive (0.169 at step ten). In the short run, this trend is consistent with the twin deficits hypothesis: fiscal growth first increases domestic absorption, which expands the current account deficit. In the medium term, however, the Ricardian mechanism described above whereby the private sector accumulates savings in response to the fiscal deficit partially offsets the demand expansion and narrows the current account deficit.

5.6 Structural Break Analysis

Table 8 shows the findings of the structural break tests for the private-public relationship.

Table 8

Structural Break Tests: Private Balance on Public Balance

Break Year	Model Specification	F-stat	R^2	p-value	
2008	Private ~ Public × D2008	12.50	0.484	0.000***	
2001	Private ~ Public × D2001	23.64	0.639	0.000***	
Interaction 2001	Public × D2001 (Chow test)	3.71	—	0.061*	

Note. OLS regressions with break year interaction dummy. D2001 = 1 if year ≥ 2001; D2008 = 1 if year ≥ 2008. Interaction term tests whether the public balance slope shifted at the break. F-stat refers to the overall model (top rows) or the interaction term only (bottom row, testparm). * p < 0.10, ** p < 0.05, *** p < 0.01.

The consequences of the structural break indicate the value of WTO accession as a pivotal moment in the private-public balancing relationship. The 2001 break model (F = 23.64, R^2 = 0.639) outperforms the 2008 break model (F = 12.50, R^2 = 0.484) in terms of overall fit, and the interaction coefficient for the 2001 break (1.212, p = 0.061) is statistically significant

at the 10% level and substantially larger than the corresponding coefficient for the 2008 break (0.662, p = 0.266). This suggests that following WTO accession, the private balance's sensitivity to the public balance considerably increased, which is in line with the theory that China's integration into international trade networks enhanced the country's sectoral adjustment channels.

Visual examination of the baseline private-on-public regression's OLS residuals (not displayed) shows a clear structural shift about 2001. with residuals shifting from systematically negative (private balance below its expected value given the public balance) to systematically positive, indicating that WTO accession opened a new phase of surplus accumulation in the private sector that cannot be fully explained by the public balance level alone. This result is in accordance with the structural interpretation of China's savings surplus as a post-WTO phenomenon given by Pettis (2013).

6. Discussion

6.1 The Private Sector as System Absorber: Implications for Economic Theory

The search for that the public sector is weakly exogenous, and the private sector is the primary error-correcting mechanism absorbing around 36% of yearly disequilibrium has major implications for the theoretical argument between neoclassical and post-Keynesian macroeconomics.

According to the neoclassical theory, government deficits crowd out private investment by increasing the cost of capital which suggests that the public sector's fiscal expansion reduces private sector activity. Our findings point to a more complex picture: the public sector's fiscal stance does indeed Granger-cause private sector behavior, but through a savings-inducing rather than investment-crowding mechanism. A one percentage point decline in the public balance is linked to a 1.20 percentage point increase in the private sector surplus in the long run, according to the estimated long-run cointegrating coefficient of 1.20 on the public balance.

The Ricardian offset hypothesis, which holds that the private sector increases savings in anticipation of future tax increases when government debt accumulates, is generally supported by this. However, the coefficient exceeding unity indicates that the private sector over adjusts in comparison to the pure Ricardian prediction of a unit offset. This over-adjustment may indicate uncertainty about future fiscal consolidation patterns, moderate saving

behavior, or the amplifying influence of China's financial repression in channeling household income to deposits.

According to the Godley framework, results support the SFC macroeconomics theoretical framework. The adjustment dynamics are unequal across sectors exactly as the theory predicts, the sectors are really linked, and the identity is maintained over time through an equilibrating process. The external sector's derived adjustment coefficient of +0.303 implies a partial and gradual external adjustment, consistent with the empirical finding that China's current account surplus has gradually declined since 2007 as the domestic private surplus has increased.

6.2 WTO Accession as a Structural Break: China's Growth Model in Transition

The finding of 2001 as the fundamental structural break in the private-public balance relationship offers empirical support to Autor, Dorn, and Hanson's (2013) 'China Shock' hypothesis, but only from a domestic viewpoint. WTO accession did not merely transform China's trade relationships with the rest of the world; it also fundamentally altered the domestic sectoral balance dynamics. After 2001, the private balance became more sensitive to the public balance, with an interaction coefficient of 1.21 compared to the pre-2001 baseline of -1.78. This shows that fiscal policy had a stronger role in determining private sector savings behavior in the post-WTO era.

This explanation is consistent with the history of China's post-WTO macroeconomic trajectory as described by Brandt, Van Biesebroeck, and Zhang 2012. WTO accession amplified export-driven investment, which raised the stakes of the private sector's balance sheet position. The private sector became more sensitive to fiscal signals, especially through the expectation channel, as businesses accumulated productive capital through export expansion. The government's implicit guarantee of macroeconomic stability, demonstrated most dramatically through the 2008 stimulus, reinforced the private sector's reliance on fiscal accommodation.

6.3 Policy Implications: Tariffs, Sectoral Rebalancing, and Fiscal Space

The research's empirical findings are directly relevant to policy in the present environment of growing trade protectionism. According to the Godley identity, the external shock to China's current account caused by the US tariffs on Chinese exports starting in 2018 must be absorbed by either a decrease in the private sector surplus or an expansion in the public sector deficit. According to the Granger Causality and VECM results, the public sector is the primary driver: fiscal expansion will induce a corresponding increase in private savings, partially offsetting the stimulative demand effect. This indicates that China's fiscal multiplier might be less than what would be predicted by simple Keynesian models, specifically since the Ricardian private sector response reduces the overall effect on aggregate demand.

Regarding handling of trade disputes, The research implies that the most efficient policy response to a tariff-induced external shock may be structural measures that directly address the composition of sectoral balances, rather than simple fiscal stimulus, For example, measures that reduce household saving rates by strengthening social insurance systems would allow the private sector surplus to decline, allowing for a smaller current account surplus without requiring offsetting fiscal expansion. This is compatible with the recommendations of the 'dual circulation' approach, which emphasizes increasing domestic consumption as a driver of growth.

Throughout the study demonstrates the importance of the Godley sectoral balancing paradigm as a tool for policy analysis. By offering a comprehensive accounting framework that combines fiscal policy, private sector behavior, and the external balance, it allows policymakers to examine the systemic consequences of policy choices in ways that partial-equilibrium trade models cannot.

6.4 Limitations and Directions for Future Research

There are a few constraints to this study that should be noted. To begin, the study is undertaken at the aggregate level and does not split the private sector balance into household and business sub-components, which are expected to have unique adjustment processes. Future studies utilizing China's disaggregated flow-of-funds data would provide a more accurate determination of the pathways by which fiscal shocks spread to the private sector.

Second, while the bivariate VECM framework is adequate given the limits of the sectoral balance identity, abstracts from the role of monetary policy, credit conditions, and exchange rate movements that may also influence sectoral balance dynamics. A more comprehensive model that includes the monetary transmission mechanism, for example, the real lending rate or M2 growth—could improve the detection of fiscal impacts.

Third, the study's sample period ends in 2025, implying that the full macroeconomic implications of the 2025 tariff escalation are the most important since Smoot-Hawley are not yet visible. Continuing the research when fresh data becomes available, and even applying real-time forecasting algorithms, would allow us to determine if the historical adjustment patterns described in this work are resistant to the current unusual external shock.

7. Conclusion

This is the first broad empirical application of Wynne Godley's Stock-Flow Consistent sectoral balances Approach to China's macroeconomic dynamics from 1982 to 2025, with a focus on the consequences of trade policy shocks. We have established four significant findings using a rigorous multi-step econometric approach that includes Granger causality testing, unit root testing, Johansen cointegration analysis, VECM estimation, and impulse response analysis.

First, the private and public balances are cointegrated with a long-run coefficient of around 1.20 on the public balance, and all three of China's sectoral balances private, public, and external are integrated of order one. The presence of a long-run equilibrium constraint connecting the fiscal situation to the private sector surplus is confirmed by this stable and well-defined cointegrating connection.

Second, the private sector absorbs around 36% of the annual disequilibrium in the long-run relationship, making it the primary error-correcting mechanism. The public sector is weakly exogenous, confirming its role as an autonomous driver of the system rather than a passive accommodator. The external balance absorbs the residual adjustment, consistent with a gradual external rebalancing mechanism.

Third, Granger causality is one-way, moving from the public balance to the private balance but not the other way around. The difference is a direct result of the Godley framework and offers a causal basis for the idea that China's private sector savings behavior is exogenously driven by fiscal policy.

Lastly, structural break analysis reveals that China's WTO accession in 2001 was the most significant turning point in the private-public balance relationship, increasing the sensitivity of private savings to fiscal policy. This conclusion places China's current sensitivity to external trade shocks, such as the tariff increase in 2025, within a longer structural trajectory of export-led growth and growing dependency between the domestic savings and fiscal processes. These results have apparent policy implications. In an environment of increasing protectionism, China's fiscal freedom and private sector adjustment capabilities will be critical to the macroeconomic response.

According to the empirical data presented here indicates that the private sector's Ricardian offset moderates the effectiveness of fiscal stimulus in China, It implies that structural measures to reduce household saving rates, including such as reforms to social insurance systems, may be more successful than pure fiscal growth in supporting domestic demand in the face of tariff-induced trade shocks.

In conclusion, the study illustrates the value of the SFC framework for macroeconomic analysis in an era of connected balance sheets. By concentrating on the equilibrating dynamics of sectoral positions and requiring full accounting consistency, the framework presents insights into macroeconomic resilience that standard trade models cannot deliver. As the global economy navigates an increasingly protectionist era, this perspective on the domestic sectoral consequences of external shocks will be of growing importance.

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