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Rebalancing and the Chinese VAT: Some numerical simulation results

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ABSTRACT

This paper presents numerical simulation results that suggest that China can both reduce its trade imbalance and receive welfare benefits by switching the value added tax (VAT) regime from the current destination principle to an origin principle. We modify the traditional general equilibrium tax model to capture endogenous trade imbalances along with endogenous factor supply, a fixed exchange rate and a non-accommodative monetary policy structure which supports the Chinese trade imbalance. We calibrate model parameters to 2008 data and simulate counterfactual equilibrium for VAT tax basis switches in which the trade imbalance changes. Our results suggest that given China's trade surplus VAT regime switching to an origin basis can decrease China's trade surplus by over 40%, and additionally increase Chinese and world welfare. This has implications for present G20 discussions on finding ways to adjust global trade imbalances.

1. Introduction

The Chinese trade imbalance has been discussed extensively in recent years, as has rebalancing in general at G20 summits and specifically at the G20 in Pittsburgh in September 2009 as part of the Framework for Strong, Sustainable, and Balanced Growth (FSSBG). Despite this, concrete proposals for policy changes outside of exchange rate adjustments to address rebalancing are few. Here we report numerical simulation results which use a modified tax general equilibrium model with an endogenously determined trade imbalance to evaluate the impacts of changes in the Chinese VAT structure on China's trade imbalance. Our results suggest that if China were to switch its value added tax (VAT) regime from the current destination basis (DB) to an origin basis (OB), the effect would be both to significantly reduce China's trade imbalance by nearly 50% and also increase China's and world welfare. Other instruments than simply exchange rate realignments can thus contribute to rebalancing and are worthy of further attention.

This effect reflects the feature that under a VAT destination basis, imports are taxed while input taxes are rebated (as currently), while under an origin basis, imports enter tax free but exports receive no tax rebate. Existing public finance literature stresses the neutrality for movements between these two bases, but for this to occur trade must be balanced. In the presence of a significant Chinese trade surplus, an equal yield origin basis tax lowers the tax rate, generates efficiency gains, and can also reduce the surplus.

The analytical novelty in the paper is to work with a multi good trade model with an endogenous rather than an exogenous trade imbalance, as such models are little used in the literature. Our 3 commodity per country, 2 factor per country, 2 country

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numerical general equilibrium trade model for China with an endogenous trade imbalance reflects China's fixed basket exchange rate regime and non accommodative monetary policy. We present a monetized extension to a conventional trade model which builds on Whalley and Wang (2010) and in which the reminbi is inconvertible while at the fixed exchange rate (given monetary policy) the central bank accumulates reserves. We calibrate the model to 2008 data before performing basis switching counterfactual analyses. Data from the Chinese State Administration of Taxation show the VAT to be the largest revenue source for the national government in China, accounting for nearly 47% of Chinese total tax revenue in 2008 (CSY, 2009). Because of the size of the Chinese trade surplus, if the Chinese VAT regime were changed from a destination basis to an origin basis, the price of Chinese produced goods abroad would increase and that of foreign produced goods in China would decrease, and the trade surplus will fall. Under an equal yield tax change a consumer surplus gain would accompany the change due to a lower tax rate.

Earlier literature discussion of VAT basis switches emphasizes that a switch from a destination based commodity tax to an origin based production tax has no real effects under conditions of trade balance and price flexibility (Berglas, 1981; Grossman, 1980; Lockwood, Meza, & Myles, 1994; Whalley, 1979); but is not neutral if a trade imbalance exists (Genser, 1998; Lockwood et al, 1994). The VAT is usually thought of as a consumption tax, based on the added value at each stage of a products manufacturing or distribution. Credits apply to taxes paid by purchasers, and so it is ultimately passed on to the consumer who is ineligible for tax credits.

Our numerical simulation results suggest that it could be advantageous for China to switch the VAT from a destination to an origin basis given China's trade surplus. China can not only reduce its surplus, but also either collect more tax revenue or on an equal yield basis lower tax rates and improve welfare. The general equilibrium model we use employs a structure with a labor-leisure choice to provide endogeneity of factor supply, a fixed exchange rate and an endogenously determined trade surplus.

The paper is organized as follows. Part 2 briefly discusses the Chinese VAT and discusses the potential impacts of basis switches for rebalancing. Part 3 presents the model and outlines its calibration. Part 4 presents simulation and sensitivity analysis results. The last part presents conclusions.

2. Rebalancing, the Chinese VAT regime and destination and origin bases

China's trade surplus has grown quickly in recent decades, especially in the last ten years. In 2000, the trade surplus was only $24.1 billion US dollar, but by 2008 it had increased to $298.1 billion. After financial crisis, China's trade surplus remained high at $196.1 billion and $183.1 billion in 2009 and 2010 (Fig. 1). China's large trade surplus has been a concern in the G20 summits with rebalancing set as an important task in the post-crisis period. Finding measures to reduce China's trade surplus while not impacting China's performance is thus important for both China and the world.

In this paper, we suggest that China can change its present destination basis VAT regime to an origin basis to rebalance trade with no loss of welfare. Under the destination basis, China will tax its import goods but exempt exports, so that import goods prices include tax but export goods prices do not. If China's VAT were changed to an origin basis, exports would be taxed and imports not, which would mean that export prices would include tax while imports would not.

China is unique in having two separate components of their VAT; one applying to domestic transactions (or domestic VAT) and one applying to international trade transactions (import VAT and export refunds). VAT, introduced in 1994, is one of the most

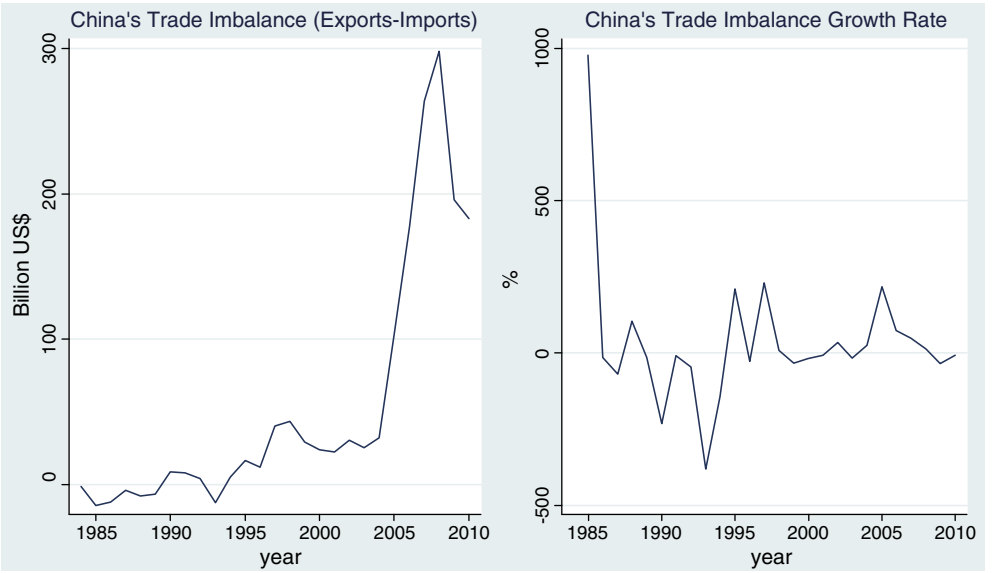

Fig. 1. China's trade imbalance value and growth rate: 1985–2010.
Data Source: Interactive Graphic System for International Trade Data (SIGCI).