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The Golden Tax Project, value-added tax statistics, and the analysis of internal trade in China

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ABSTRACT

This paper utilizes a previously unavailable database on the commodity transactions of firms to analyze internal trade in China. This database is built from value-added tax (VAT) invoices collected under a comprehensive management information system, the Golden Tax Project (GTP). This project was established in 1994 to monitor and administer VAT collection and has been improved over the subsequent years. We present the structure, function, and evolution of the GTP, which provides reliable information on transaction values across provinces. We have access only to part of the GTP data set relevant to internal trade. The data suggests that internal trade in China has grown quickly but with seasonal fluctuations. Although the interprovincial trade in China is smaller than the interstate trade in United States and the intra-European Union trade, the high growth rate of the interprovincial trade suggests that economic connections among the provinces are strengthening. The positive relationship between internal trade and international trade in most regressions suggests the possible complementarity between these two types of trade.

1. Introduction

This paper utilizes a new data set on internal trade in China based on value-added tax (VAT) invoices, which have been collected by a significant administration project, the Golden Tax Project (GTP). VAT is levied on most transactions, including those of agricultural goods, manufactured goods, and more recently, a number of special service items in China. The central government has constructed the GTP to collect large amounts of information from VAT invoices. This information includes the trading partners' locations, the names and types of goods, the transaction value, and the VAT payable. The data collected by GTP is more comprehensive and more reliable than other Chinese firm-level transactions-based data sets. By way of example, approximately 30 million transactions were inspected by GTP in January, 2009 alone. The GTP database can thus be used directly to analyze firms' transaction behavior at the micro level (or matched with firms' financial indicators) and reveal trade flows at the macro level when aggregated across regions. However, it is impossible to obtain all observations in the GTP in a single shot. For this project so far, we have access to the transaction values aggregated at the provincial level from 2003 to 2009. This data set enables us to investigate the evolution of internal trade in China after accession to the WTO, up to the international financial crisis of 2008.

We use these data to revisit studies on internal trade in China for a later period. Most literature published during the last 15 years focuses on China's market integration before 2000. For example, Young (2000) indicates that the reform process in China led to domestic market fragmentation before 2000, whereas Holz (2009) argues that China was a normally integrated economy compared with the United States during the same period. By using data extracted from provincial input–output tables (IOT),

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Poncet (2003) finds that the greater involvement of Chinese provinces in international trade went hand in hand with a decrease in the domestic trade flow intensity between 1987 and 1997. By relying on industry-level trade flows from IOT, Poncet (2005) finds that the domestic market fragmentation in China became more severe in the 1990s.

We reveal the more recent development patterns of internal trade in China by using these data. We first describe the VAT system in China and discuss the evolution and function of the GTP. The management of the GTP ensures that the data we use has a high reliability to reflect internal trade. Then, we discuss the construction of the internal trade data and investigate the high growth rate of both interprovincial trade and intra-provincial trade. Lastly, we show that these data has implications for internal trade in China. Interprovincial trade tends to grow quickly in the long-run, but it dropped in January in each year. In addition, the eastern regions of China are always the most important regions for interprovincial trade. Compared with interstate trade within the United States and intra-EU trade, internal trade in China has a relatively small size but a high growth rate.[1] The positive relationship between internal trade and international trade reveals that these two types of trade are possibly complementary.

This study makes several contributions. First, we use a new database for the first time that has large-scale data and can potentially be used in many other studies on the transaction behavior of firms. Second, we document the management and control process of the GTP, which was previously almost unknown to economists. This discussion also provides the evidence of high reliability of these data. Third, we use this data set to update studies on the domestic market integration (or fragmentation) in China in the 1990s to show new trends in internal trade in the 2000s. This paper not only reports the patterns of internal trade in China, but also compares trade in China with that within the EU and the United States. The potential relationship between domestic trade and international trade is tested under a simple framework.

2. The VAT system and the Golden Tax Project in China

2.1. The VAT system in China

Final goods are usually produced via multistage production, so firms transact with other firms upstream and downstream. In this production chain, the government levies indirect taxes on the production or sale of goods at each stage. To avoid double taxation, VAT is designed to tax the value added in each stage. In developing countries such as China, VAT contributes to national fiscal revenue much more than in developed countries.

In China, VAT is paid by economic agents (mainly firms) who produce, process, and manufacture tangible goods. Thus, VAT is mainly collected from firms in both the agricultural and the manufacturing industries.[2] When paying VAT, taxpayers are divided into two types according to their size and accounting system. In general, small firms and firms with a very simple accounting system (usually also small firms) pay VAT with a simple collection method. In this case, the amount of VAT equals the transaction value multiplied directly by the tax rate (3% or 5%). Using this method, the tax authorities can reduce the collection costs of VAT. Most other firms, the so-called general VAT payers, pay VAT by the credit method. When a firm produces and sells goods, the sale value multiplied by the tax rate (usually 17%) is its output tax. When it purchases input or intermediate goods, the purchasing value multiplied by the tax rate (also usually 17%) is its input tax. The amount of VAT it pays equals the output tax minus the input tax, or, the input tax can be credited from the output tax:

$$\mathrm{VAT} = Y * t_{\mathrm{o}} - M * t_{\mathrm{I}}, \tag{1}$$

where Y is the output, M is the intermediate input, and t_{o} and t_{I} are the tax rates of the output and the input, respectively. In China, most goods face a tax rate of 17%, a few goods have a tax rate of 13%, and even fewer goods are zero-rated. The key in this system is that firms must ensure that their output tax and their input tax are effective (certificated by the tax authorities) when calculating VAT. All of the indicators in Eq. (1) are listed in the special VAT invoices. This is the so-called VAT system based on the invoice method.

2.2. The Golden Tax Project

The VAT invoice is the key to the VAT system in China and other countries. However, VAT collection in China has always been facing serious challenges of tax fraud ever since 1994. Without effective supervision of VAT invoices, VAT fraud through counterfeiting, reselling, or stealing VAT invoices, or through invoicing false transactions, can occur. Responding to potential and actual tax fraud, the State Administration of Taxation (SAT) has constructed a nation-wide network to enter, monitor, and manage VAT information and to make sure that most VAT is paid. This network is called the Golden Tax Project (GTP) and has been designed and operated in three stages since 1994.[3] This project covers the vast majority of agricultural and manufacturing goods transactions in China and includes a large amount of information on the transactions of firms within the country.

The GTP is a management information system that has been updated in three stages over the last two decades (see Table 1). In 1994, a simple cross-inspection system of special VAT invoices was put into operation in 50 pilot cities across China. This was the first

[1] Interstate trade in United States is huge and the home bias effects at the state level are significant and decreasing over time (Wolf, 2000; Yilmazkuday, 2012).

[2] Agricultural products from home production are tax free. Only a small fraction of service goods, “service of repairs and replacement,” is also covered by VAT. However, a tax reform with VAT expanding to other service goods gradually was launched in 2012.

[3] The Chinese government has devised a system of e-governance to perform anti-corruption and professionalization campaigns (Kluver, 2005). GTP is one of the twelve subsystems.