The Global Slack Hypothesis: New Evidence from China[*]

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ARTICLE INFO

ABSTRACT

This paper evaluates the global slack hypothesis that economic globalization has increased the role of global factors in the inflation process in China. Towards that end, we augment and estimate conventional Phillips curve inflation equations by incorporating global economic slack that is obtained through China's eighteen major trading partners in the world. Empirical results with quarterly data spanning from 1995 to 2012 provide evidence in favor of altering the domestic Phillips curve to include global slack as an additional driving variable for inflation. The findings indicate that the Chinese central bank needs to react to developments in global economic slack.

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1. Introduction

In recent years, a number of studies have addressed the question of whether greater global economic integration, or economic globalization, has had a significant impact on inflation. While there appears to be broad agreement on the importance of globalization as a real phenomenon, there is less agreement on whether global economic slack significantly drives inflation (i.e. the global slack hypothesis).[1] Borio and Filardo (2007) and Ihrig, Kamin, Lindner, and Marquez (2010) figure prominently among the most-often cited papers in the literature. These papers set the tone for the research agenda that followed, and articulated the empirical puzzle that surrounds the empirical testing of the global slack hypothesis. In short, the findings of Borio and Filardo (2007) and Ihrig et al. (2010) are somewhat surprising because they suggest that while by most standards the world has become more integrated over the past 2 to 3 decades—through trade and finance, via information and migration flows, etc.—there is little empirical evidence to conclusively validate the global slack hypothesis. Subsequent studies have reinforced this view presenting mixed results. This appears to be due in part to the relative recentness, in some sense, of globalization, and in part to serious data limitations (Martinez-Garcia & Wynne, 2010). However, a more important factor keeping the debate over the global slack hypothesis alive is the absence of a wide range of compelling and consistent empirical evidence (Ihrig et al., 2010).

To date, most of the existing studies have focused on industrial economies. The main motivation for concentrating on industrial economies, as explained in the literature, is that the increasing integration of China and other lower-cost producers into

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[1] Helbling, Jaumotte, and Sommer (2006); Pain, Koske, and Sollie (2006); Borio and Filardo (2007); Marzinotto (2009), Auer et al. (2010), Milani (2010), Pehnelt (2010), and Inerney (2013) appear to support the global slack hypothesis, while Ball (2006); Badinger (2009); Calza (2009); Mishkin (2009), and Ihrig et al. (2010) provide contrasting evidence showing that globalization has little impact on inflation process in industrial countries.

world production networks may have induced downward pressure on wages and import prices in industrial countries. However, the existing different findings for the industrial economies indicate that the integration of emerging countries into the global economy can bring interconnecting and two-way impacts on the inflation process of advanced economies. On the one hand, higher demand may drive up prices for energy, raw materials, and general commodities, which eventually reflects in overall price inflation. On the other hand, an influx of lower cost labor, products and services into the world market can drive prices downward. This two-way impact may also explain, to some extent, why the global slack hypothesis remains a controversy when data for industrial countries are considered.

Unlike the industrial economies, China is less likely to experience the two-direction effects of globalization on its inflation process, being that it is the world's largest developing and emerging economy. For instance, economic globalization and the associated rise in trade integration have bolstered the dependence of Chinese economy on global demand and supply via the international goods market. When the prices of the global goods market increase, for example, China's domestic prices also tend to rise. In the meantime, there is no influx of lower cost labor, products, and services from industrial economies into China's market, so that there is no counter-effect to rising prices in China. From this aspect, the impact of globalization on inflation in China would be less ambiguous than industrial countries.

Indeed, China has now opened its economy markedly and improved their connectedness to world trade networks more than that in the industrial countries. In conjunction with rising globalization, China has also witnessed a marked change in the nature of the inflation process. For example, both the level of inflation and inflation persistence are found to be significantly lower in the recent ten years than before (Zhang & Clovis, 2010).

Therefore, this paper evaluates the global slack hypothesis for China. We attempt to examine the impact of global economic slack on inflation in China and link the results to broader debates in the academic literature as well as policy implications. To this end, we specify a dynamic model within a conventional backward-looking Phillips curve model, but modify the standard assumption of an elasticity of domestic demand via the inclusion of global economic slack, to provide a channel through which globalization may alter the dynamic response of inflation to domestic demand. To preview our results, we find that global economic slack exerts significant impact on China's inflation, but domestic output gap appears to be insignificant.

Our finding is in a broad consensus with existing studies of Phillips curve models using Chinese data. For example, Gerlach and Peng (2006) find that the standard Phillips curve model with domestic output gap does not fit the Chinese data well. They modify the Phillips curve model by including an unobserved variable that obeys a second-order autoregressive process to control for the omission of potentially important variables and obtain a better fit. In addition, Scheibe and Vines (2005); Funke (2006), and Zhang (2013) all find that the statistical significance of the output gap in the traditional Phillips curve models for China is fragile. In sum, while existing studies have examined various specifications for inflation dynamics in China, little evidence exists regarding their relevance for global economic slack in affecting Chinese inflation dynamics.

The rest of the paper is organized as follows: Section 2 describes the data used in the empirical analysis and stylized facts of inflation and globalization in China; Section 3 presents the baseline model and estimation results for inflation dynamics with globalization; Section 4 is a robustness analysis, followed by explorations of relevant implications in Section 5; Section 6 concludes the paper.

2. The data and stylized facts

The data series considered in this paper were chosen to provide relations that are of most interest for policy analysis and to facilitate comparisons with the relevant literature. In all, our empirical analysis involves series for overall inflation, a measure of the domestic real output gap, and a measure of the foreign real output gap. Most of the data series were obtained from the China Economic Information Center (CEIC) database, except for China's nominal and real gross domestic product (GDP) series, which were obtained from Datastream. The raw level data for all quarterly series were seasonally adjusted prior to any further application. The final series used in empirical estimations are stationary (confirmed by conventional unit root tests). The sample size in our empirical estimations spans the first quarter of 1995 to the last quarter of 2012 (i.e. 1995Q1–2012Q4).

China's overall inflation is measured by quarterly year-on-year growth rate of GDP deflator. The raw data for GDP deflator is derived by dividing real GDP by nominal GDP. The real domestic output gap was obtained from Hodrick–Prescott (HP) filter on the corresponding real GDP series (with the smoothing parameter 1600 for quarterly data). In robustness assessments, we also use growth rate of real GDP and quadratically detrended log real GDP to approximate the real output gap in the model. In addition, there are several approaches available for calculating the foreign output gap, namely, trade-weighted, exchange rate–weighted, and GDP-weighted foreign output gaps. As explained in Borio and Filardo (2007), the trade weights emphasize the role of trade competition, the exchange rate–weighted weights emphasize the role of the exchange rate regime in "exporting" inflation from one country to another, and the GDP weights reflect global slack conditions.

Since the exchange rates between Chinese yuan and foreign currencies generally remain fairly steady, exchange rate–weighted foreign output gap cannot really differentiate exchange rate regimes in the construction of foreign output gap. Therefore, in this article, we employ trade-weighted and GDP-weighted methods to construct foreign output gap.

In terms of constructing the trade-weighted foreign output gap, we calculate a weighted sum of the real GDP gap measure of China's top 18 major trading partners based on their trading weights with China.[2] Specifically, the weight for each trade partner in

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[2] China's top 18 major trading partners include Australia, Canada, France, Germany, Hong Kong, Indonesia, Italy, Japan, Korea, Malaysia, Netherlands, Russia, Singapore, Thailand, Taiwan, The United Kingdom, The United States, and Latin America. Note that the trade data for Latin America aggregates the corresponding data of Argentina, Brazil, and Chile. The trade data and real GDP series for the 18 countries/regions were obtained from CEIC database.