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Price and income elasticity of Indian exports—The role of supply-side bottlenecks☆

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ABSTRACT

This paper estimates the short-term and long-run price and income elasticity of Indian exports, and investigates the role of supply-side bottlenecks in shaping India's export demand relationship. We use disaggregated export volume data for 45 Indian industries over the period 1990–2013, as well as industry-specific international relative prices, for estimation. Our results indicate that Indian exports are sensitive to international relative-price competitiveness, world demand, and energy shortages. In addition, binding supply-side constraints (notably energy shortages) dampen price responsiveness in the short-term.

1. Introduction

India's goods exports, in U.S. dollar terms, grew on average by over 20 percent per year during the period 2000–2011. While falling temporarily in the aftermath of the Global Financial Crisis, the value of exports has remained essentially flat since 2011 (Fig. 1). Global factors have adversely affected India's exports, as potentially did the appreciation of the real effective exchange rate. Moreover, binding supply-side bottlenecks have likely contributed to India's sluggish export performance.

The composition of the Indian goods export basket is unique—ranging from primary products to low- and medium-technology manufacturing goods. With primary and resource-based products accounting for only about 1/3 of total exports, India's export performance should depend not only on the strength of external demand but also on the degree of price competitiveness. Accordingly, it has been argued that Indian exports have been undermined by the rupee's appreciation in real effective terms during the period 2010–13, partly owing to persistence of India's high inflation differentials in this period.

Last but not least, the weakness of export growth, but also of domestic industrial activity more generally, have also been attributed to the severe supply-side constraints that India faced during the last several years. In particular, the lack of energy availability (electricity, coal and also natural gas) has often been singled out as a key impediment to industrial recovery.

This paper estimates the short-term and long-run price and income elasticity of Indian merchandise exports, and investigates the role of supply-side bottlenecks in shaping export performance. We contribute to the literature by constructing a dataset of disaggregated export volume indices and international relative prices for 45 Indian industries, by providing new elasticity estimates using the pooled mean group (PMG) estimator of Pesaran, Shin, and Smith (1999), and by highlighting the importance of energy availability in fostering exports in India. Despite India's prominent role in global services export markets, this study focuses on mer-

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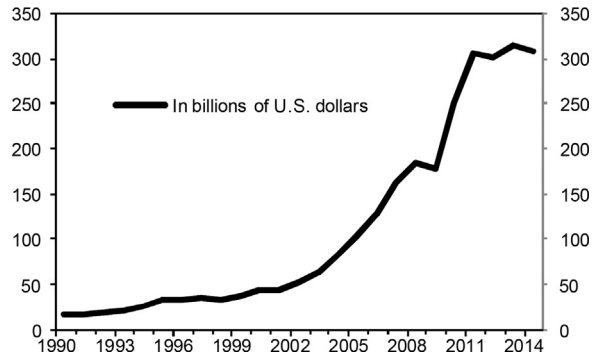

Fig. 1. India's merchandise exports: 1990–2014.

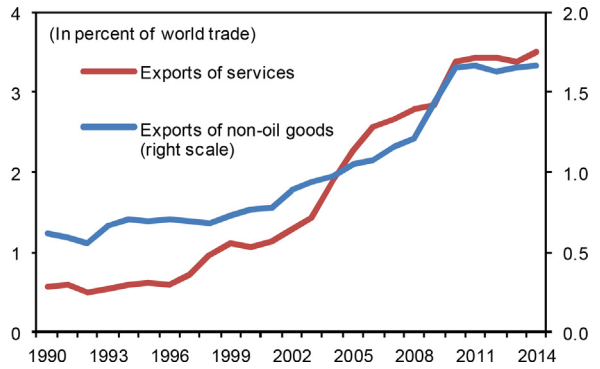

Fig. 2. Evolution of India's market share.

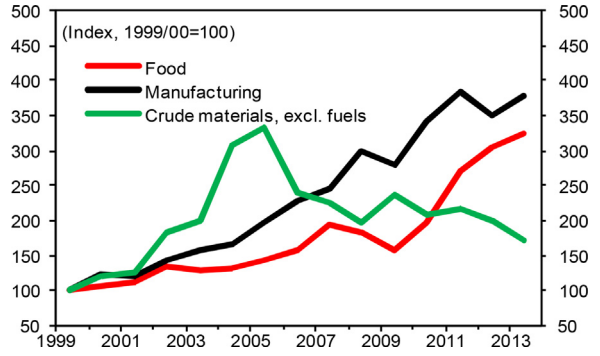

Fig. 4. India's merchandise export volume.

chandise exports for several reasons: including the fact that goods exports account for the bulk of export receipts; data availability; well-established economic theory foundations; and more apparent linkages between supply-side bottlenecks and goods exports. It is also an area of critical policy relevance given India's ambitions to foster manufacturing exports.

Our results indicate that Indian goods exports are sensitive to external demand and to international relative-price competitiveness. The estimated average (across various product groups) long-term income elasticity of about 1.5 indicates that India's exports have tended to outpace growth of global demand. The average international relative price elasticity of about −0.9 is near unity (in absolute terms), although manufacturing sector exports are estimated to be more price elastic, with an average coefficient of about −1.1. Manufacturing exports are also found to be sensitive to global demand developments in the short-term. Our results suggest that the prospects of a sluggish global economic recovery will pose challenges for India to achieve a significant export growth acceleration in the coming years. Finally, binding supply-side constraints (notably energy shortages) dampen the price responsiveness in the short-term asymmetrically (i.e. depreciation episodes are not followed by higher exports owing to supply-side bottlenecks, while the opposite is not necessarily true for appreciation episodes).[1]

The rest of the paper is organized as follows. Section 2 examines the evolution of Indian exports over the last two decades, while Sections 3 and 4 describe the methodology and data used to estimate the export demand equations. Section 5 presents the empirical results. Section 6 concludes and outlines key policy implications.

2. Background

India's exports, both as a share of GDP and as a percent of world exports, have been increasing strongly since the early 1990s. The pick-up in India's world market share in non-oil exports have been particularly pronounced since the early 2000s—more than doubling from about ¾ of a percent to about 1¾ percent by 2011. Even more striking has been the surge in India's market share in services exports, in which India now retains close to 4 percent of global services trade and about ⅓ of India's total exports (Fig. 2).

In the absence of natural resource abundance, India's export basket has evolved to be relatively diverse (Fig. 3). Manufacturing and chemical exports, which account for about ⅔ of total exports, are concentrated in the low- and medium-tech industries. The emergence of refined petroleum as a major export group underscores the capital intensity focus of industrial production in India (Anand, Kochhar, & Mishra, 2015). Nonetheless, key traditional sectors, such as cereal and tea production, have managed to retain their weight.

In real terms, however, export growth has been slower than in U.S. dollars terms– at around 10 percent per year during the period 2000–11. More disaggregated export data reveals further heterogeneity. Food industries, which account for about 10 percent of total exports, have continued to post robust export growth figures in the last few years. However, the export growth of manufacturing industries has essentially stalled. Finally, exports of non-fuel crude materials have plummeted, primarily reflecting weakness of the iron and steel manufacturing (Fig. 4).

Sluggishness of India's key industrial exports growth should be hardly surprising given the subdued external demand since the onset of the Global Financial Crisis. Specifically, the trade-weighted GDP growth of India's partners has decelerated from about 2½ percent during 2000–07 to just 1¾ percent during 2011–13. Furthermore, the volume of non-oil import demand from India's trading partners has slowed even more drastically: from about 10 percent during 2000–07 to just 6 percent during 2011–13. Export growth was probably also held back by India's exchange rate appreciation in real effective terms, following a surge in India's CPI inflation during 2010–14 and also strong wage growth across key sectors (Fig. 5).

India's Central Electricity Authority estimates indicate a persistent energy utilities deficit in the country, which has widened steadily since the early-2000s (CEA, 2013) with rapidly increasing energy demand (Fig. 6). Notwithstanding numerous policy reforms over the past 20 years, transforming India's energy sector from a predominantly government-owned system towards one based on market principles, the Indian power sector still faces shortages of fuels (mostly coal but also natural gas), insufficient infrastructure and financial weakness of state-owned power companies, including due to distorted fuel pricing mechanisms (IMF, 2013; Ahn & Graczyk, 2012). Despite increased installed capacity, electricity generation has been affected by shortages of coal, which

[1] Bahmani-Oskooee and Saha (2017) adopt a non-linear ARDL approach to uncover such asymmetries.

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