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Evaluating the effect of exchange rate and labor productivity on import penetration of Brazilian manufacturing sectors ☆

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Abstract

In recent years, several economists have argued that the sharp loss of competitiveness of the Brazilian industry was caused by a strong exchange rate appreciation. However, other economists have attributed this loss of competitiveness to the dismal growth of labor productivity in the Brazilian industrial sector. The present paper proposes to estimate the differential impacts of variations in exchange rate and labor productivity on the Brazilian market share of imports measured by the coefficient of import penetration of total demand for manufacturing goods. We start by developing a simple theoretical model to investigate under what conditions the impacts of an exchange rate depreciation and an increase in labor productivity would differ. We test the theoretical implications of the model by means of a GMM panel data analysis focusing on 17 manufacturing sectors in the period between 1996 and 2011. Our results suggest that both variables matter to explain the coefficient of import penetration. Nevertheless, labor productivity has the strongest negative impact on the market share of imported goods, even after controlling for sector fixed-effects.

JEL classification: O14; L6; L16; C23

Keywords: Industrial sector; Imports; Exchange rate; Labor productivity

Resumo

Recentemente, alguns economistas têm apontado um perigoso processo que consiste na perda de competitividade da indústria brasileira causada pela forte apreciação cambial. No entanto, outros economistas têm relacionado esse processo à fraqueza da produtividade industrial brasileira. Neste contexto, o nosso trabalho avalia as diferenças do impacto da taxa de câmbio e da produtividade do trabalho sobre a participação das importações medida aqui pelo coeficiente de penetração da demanda total por bens importados decomposta em setores industriais. Além disso, desenvolvemos um modelo teórico para o entendimento e

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diferenciação de tais impactos. Empiricamente, fazemos uso de uma análise de dados em painel (GMM) considerando 17 setores da indústria transformadora no período entre 1996 e 2011. Nossos resultados sugerem que ambas as variáveis são importantes para explicar o coeficiente de penetração das importações. No entanto, a produtividade do trabalho tem o maior impacto sobre a participação das importações, mesmo quando a avaliação é feita em termos de grupos setoriais.

Palavras-chave: Setor industrial; Importações; Taxa de câmbio; Produtividade do trabalho

1. Introduction

In recent years, the competitiveness of the Brazilian manufacturing sector has become an important policy issue among economists and policy-makers as a consequence of the rapid increase in the share of imported goods in the domestic market since the 90s. In 1996, imports represented only 6.5% of the domestic consumption of manufactured goods. This participation soared during the 2000s, reaching 23.0% in 2008, with a small decline in 2011 to 19.5%. According to several economists, policymakers and industry associations, this large increase in the import penetration coefficient is to be blamed on the excessive appreciation of the exchange rate.

Indeed, the Brazilian currency (real) appreciated in real terms (relative to US dollar) by 60% between 2003 and 2011. According to Armando Monteiro Neto, president of National Confederation of Industries (CNI), the appreciation of the exchange rate affects the competitiveness of the Brazilian manufacturing sector not only abroad, but also in the domestic market. Furthermore, more than 50% of all industrial segments in 2009 faced import competition (Monteiro, 2010). CANO (2012) as well as Bresser-Pereira and Marconi (2010) also emphasize this aspect, suggesting that the level of the exchange rate is the main factor behind the loss of competitiveness of the manufacturing sector during the last decade, and warn that it could lead eventually to a process of deindustrialization.

There is little doubt that exchange rate has an important impact on the level of competitiveness of Brazilian manufactured goods. According to Broz and Frieden (2006) a real appreciation of exchange rate increases the purchasing power of local residents by lowering the relative price of foreign tradable goods. These authors also emphasize that there is a trade-off between competitiveness and purchasing power and that the exchange rate plays a crucial role on the determination of the equilibrium.

However, it is important to point out that, in spite of its importance, the exchange rate is not the only factor that explains the loss of competitiveness of Brazilian manufactured goods. Naturally, productivity is also a key determinant of the evolution over time of the competitiveness of the domestic industry. Bonelli and Pinheiro (2012) listed direct and indirect factors related to productivity that have limited the competitiveness of the Brazilian manufacturing industry. For instance, the quality of infrastructure, the investments in R&D, absorption of foreign technology, labor cost and the educational level. As consequence, in terms of domestic factors, exchange rate is not the only key factor to explain the increase of import penetration, but productivity is also a crucial element. It is, therefore, important to examine which factor that has a larger impact in determining the share of imported goods in the total demand for manufactured goods.

This article evaluates the broad effect of exchange rate and productivity on the recent dynamic of import penetration in the Brazilian demand for goods in the manufacturing sectors. Moreover, we investigate which factor has the greatest impact. At first sight, it is not clear why the impact of exchange rate and productivity on import penetration would differ. We, thus, propose a simple micro-founded model to examine under which specific conditions productivity (as measured by the ratio between industrial production and number of workers) would lead to a larger increase in import participation on domestic market when compared to an exchange rate depreciation. We show that the crucial factor that generates this difference is the participation of foreign inputs in the domestic production. This theoretical result is in line with the argument put forward by Lisboa and Pessoa (2013) that devaluations may protect national industry, but, at the same time, raise the costs of foreign inputs.

To investigate whether this predicted difference in impacts is relevant empirically we make use of panel data regressions for 17 manufacturing Brazilian sector covering the period between 1996 and 2011. Since there may exist simultaneity between labor productivity, exchange rate and import penetration leading to biased estimators, we use a GMM panel data methodology based on Arellano and Bond (1991). Specifically, this method takes the first differences of the variables to eliminate unobserved sector-specific effects and use lagged instruments to correct for simultaneity.