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THE COMPETITIVE EFFECTS OF CHINA ON THE SOUTH AFRICAN MANUFACTURING SECTOR

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Introduction¹

A number of academic studies have analysed the economic impact of China on Sub-Saharan Africa (SSA) in general (Goldstein et. al., 2006; Jenkins and Edwards, 2006; Kaplinsky et. al., 2006; Broadman, 2007; Zafar, 2007; Brautigam, 2009; Giovannetti and Sanfilippo, 2009), and on specific countries (e.g. the series of papers produced by the African Economic Research Consortium, Ademola et.al., 2009). With a few notable exceptions these have given limited attention to the effects of China on manufacturing in SSA, partly reflecting the perception that the main economic impacts on the region are on primary commodities.²

South Africa as the largest and most advanced economy in the region, and with a relatively highly developed industrial sector, presents a rather different picture from the rest of SSA. While it is also a major exporter of raw materials and as such has benefited from the growth in Chinese demand, it is not a highly aid dependent economy characterized by a weak state. Its relatively sophisticated manufacturing sector means that China's growth poses challenges which are not so pronounced in the rest of SSA and bear a much greater resemblance to those faced by South American countries such as Brazil or Argentina.

The impact of China on other developing countries can be analysed in terms of its direct and indirect effects, and competitive and complementary effects (Kaplinsky et. al., 2006). Direct effects are associated with bilateral trade whereas indirect effects arise from China's global economic impacts. Competitive effects arise when Chinese products are close substitutes for those produced by other developing countries, whereas complementary effects arise where products concerned are complements. Imported Chinese goods may compete with the products of some domestic manufacturers, but may also be complementary to other local producers who use Chinese inputs.

The common perception in South Africa is that the growth in Chinese trade has had a negative direct competitive effect on domestic manufacturing output and employment, with several industries, most notably textiles and clothing, but also rubber, paper and metal products, demanding increased protection from Chinese imports (Morris and Einhorn, 2008; Mail and Guardian, 2011; Business Day, 2013).³ Concerns have also been raised that South African exports of manufactured goods to neighbouring countries have been indirectly crowded out by Chinese exports (Burke et al. 2008), although there is recognition that South African exporters of resource-based products have indirectly benefited from higher commodity prices.

The contradictory impacts of China's economic expansion make South Africa a particularly interesting case to study. Despite this, there are few studies that have comprehensively analysed the impacts of trade with China, on the South African manufacturing sector.

In this paper, we draw on research output from three different papers (Edwards and Jenkins, 2013a, 2013b and forthcoming) to evaluate the competitiveness effects of Chinese trade on the South African manufacturing sector. The paper focuses on three effects. Firstly, the direct impact of Chinese import

¹ This paper is based on four papers (Edwards and Jenkins, 2013a, 2013b, 2014 and forthcoming) produced as part of a project on "Chinese Competition and the Restructuring of South African Manufacturing" funded by the UK Economic and Social Research Council, Grant No. ES/1035125/1. The project was administered by the Southern African Labour and Development Research Unit at the University of Cape Town in South Africa and the School of International Development at the University of East Anglia in the United Kingdom.

² Among the few exceptions to this generalization are Kaplinsky and Morris (2008), Giovannetti and Sanfilippo, (2009) and Edwards and Jenkins (2013).

³ For a list of products on which anti-dumping duties have recently been imposed or retained, see the International Trade Administration Commission (ITAC) site (<http://www.itac.org.za>).

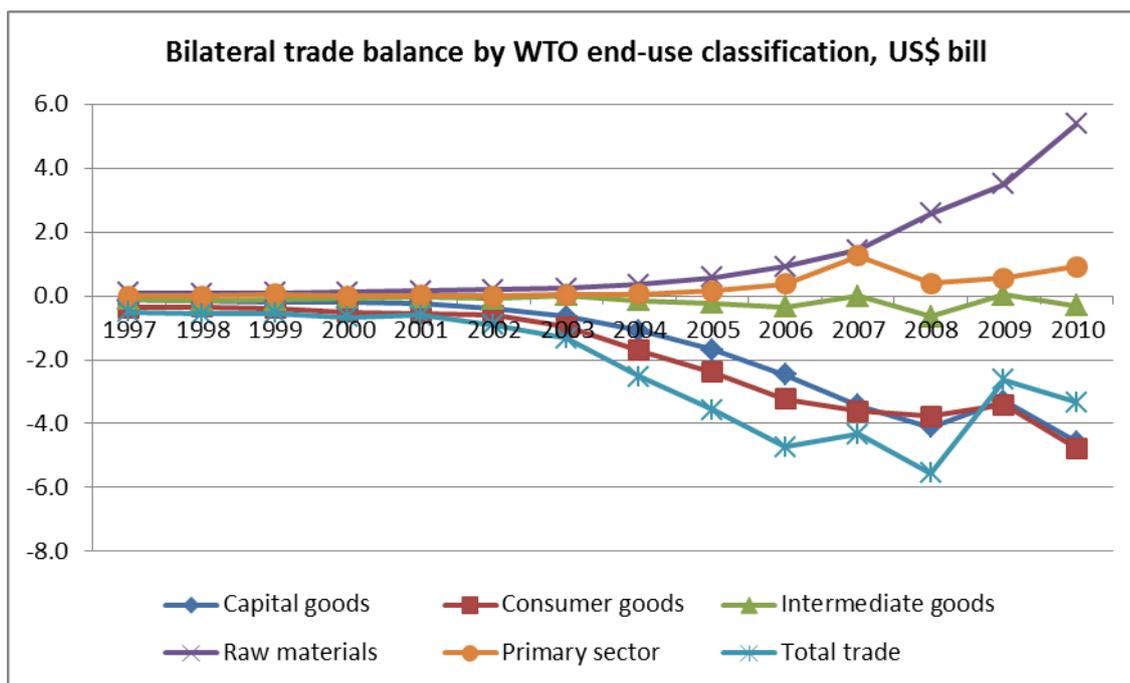
competition on domestic prices. Secondly, the direct impact of Chinese import competition on output and employment in domestic manufacturing. And thirdly, the indirect ‘crowding-out’ impact on South African manufacturing exports from Chinese competition. Before presenting the key findings with respect to each of these effects, the paper first presents a brief overview of bilateral trade flows with China.

1. Growth and Structure of Chinese-South Africa Trade

Since China joined the WTO in 2001, bilateral trade with South Africa has grown rapidly. Imports increased from less than \$1.1 billion in 2001 to \$14.2 billion in 2011, while exports to China increased from less than \$0.5 billion to \$12.4 billion over the same period. China is now South Africa’s largest trading partner, both in terms of exports and imports.

Trade between South Africa and China is mainly in manufactured goods, broadly defined, but there are important differences in the composition of exports and imports. South African exports are largely processed raw materials, whereas imports from China are mainly consumer products and increasingly, capital goods. This is reflected in the trade balances between the two countries with South Africa having surpluses in processed raw materials and primary products, and large deficits in consumer and capital goods (Figure 1).

Figure 1: South Africa’s trade balance with China



Source: Author’s calculations using UN Comtrade data. Categorization determined by World Trade Organization based classification system.

China’s growing presence in South African trade in manufactured goods is reflected in the scope and dominance of trade with China in specific manufacturing industries. Edwards and Jenkins (forthcoming) report China’s share of total South African imports and domestic consumption for 44 manufacturing industries in 2000 and 2010. In the mid-1990s, China dominated as a source of imports in the traditional labour-intensive industries such as clothing, footwear and other manufactures (toys), but by 2010 its dominance had also shifted to high-technology electronic and machinery industries. By 2010, China

accounted for more than 50 percent of imports of knitted and crocheted fabrics, clothing, footwear, household appliances and electrical lamps.

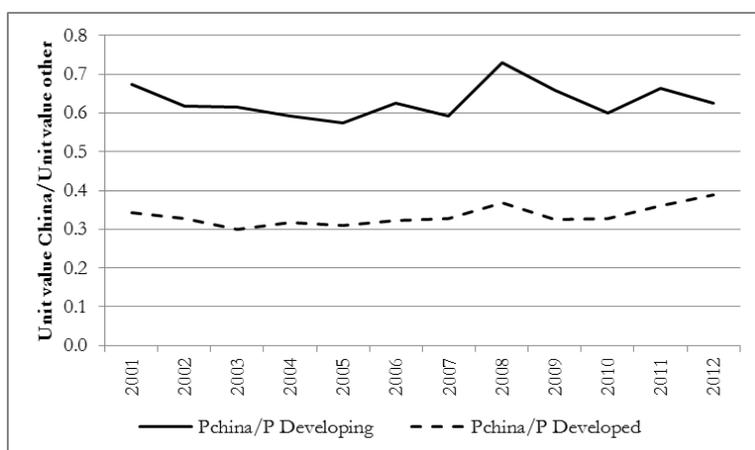
The growth in imports from China is also reflected in the rising share of these goods in domestic consumption of intermediate inputs and final goods (termed import penetration). In aggregate, imports from China rose from 1.1 percent of domestic consumption in 2000 to 5.9 percent in 2010, with particularly strong increases in the labour-intensive and high-technology electronic and machinery industries. The level and change in import penetration from China were smallest (less than one percentage point from 2000 to 2010) in agricultural and resource-based products such as food & beverages and basic metals.

China's share of total South African exports of manufactured goods also more than doubled over the period 2000 to 2010, but at 2 percent in 2010 remains extremely low. Consequently, the share of exports to China in total domestic production is generally low across industries, although it has risen relatively quickly in the resource-based industries such as basic iron and steel, non-ferrous metals and basic chemicals.

2. Impact of imports from China on domestic producer prices

One explanation for the sharp increase in the share of imports from China in total imports and domestic consumption is their relatively low prices. To illustrate this, Figure 2 presents the weighted average price of South African imports of manufactured goods from China relative to imports from other countries (obtained from Edwards and Jenkins, forthcoming). Imports from China are around 63 percent of the price (unit value) of imports from other developing countries and a third of the price of imports from developed countries.

Figure 2: Price per unit of imports of manufactured goods from China relative to imports from other countries, 1992-2009



Source: Edwards and Jenkins (forthcoming).

Notes: Calculations are based on UN Comtrade data. Developing countries include low and middle income economies, excluding China. Developed countries include high-income OECD countries. Relative unit values of South African imports of manufactured goods are calculated using 6-digit level of the Harmonized System, Revision 88/92. The aggregate price per unit import for each of the developed and developing country groups is first calculated by dividing total South African import values by quantity at the HS 6-digit level for each of these country groupings. The price per unit of imports (at the HS 6-digit level) from China relative to imports from the country groupings is then constructed. The figure presents the weighted average relative unit value calculated using annual Chinese import values as weights.

The relatively low price of imports from China will have placed downward pressure on domestic prices through various channels, including the replacement of more expensive imports from other trading partners

(as in Kamin, Marazzi and Schindler (2004, p. 5)), the forcing of domestic firms to lower their price-cost mark-ups, and the introduction of new product varieties (as in Broda and Weinstein (2010)).

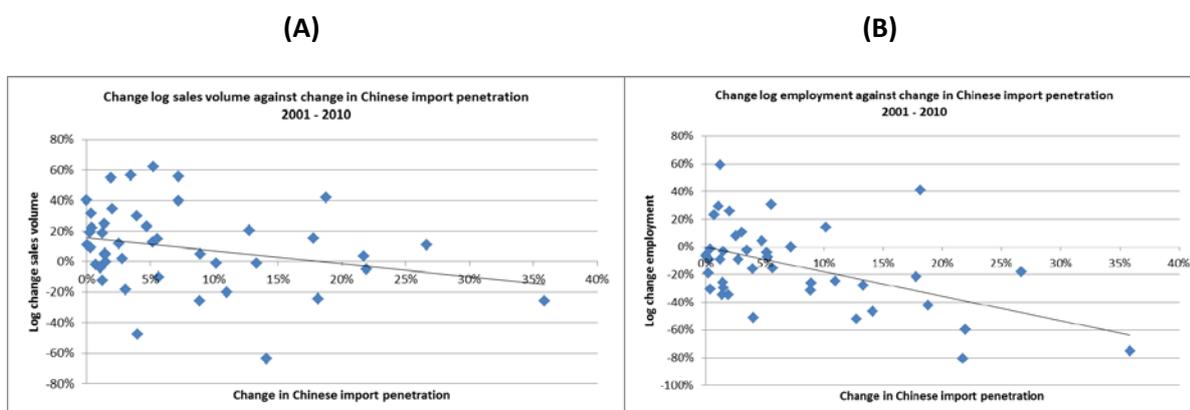
Evidence of these effects is reflected in the relatively slow growth from 2000 to 2011 in producer prices of imported manufactured (3 percent per year), compared to South African produced manufactured goods (to 6.3 percent per year). Industry case studies also find evidence that Chinese competition reduced prices of clothing, leather products and footwear (Morris and Einhorn, 2008; Rangesamy and Swanepoel, 2008; Villoria, 2009; Edwards and Rankin, 2012). Finally, in Edwards and Jenkins (2013a) we estimate a producer price equation for 44 manufacturing industries over the period 1993 to 2009 and find that Chinese import penetration reduced producer price inflation by around 0.3 percent per year from 2005 to 2010.

The implication is that imports from China moderated increases in consumer prices and helped to curtail production cost increases. However, the downward pressure on producer prices from imports from China will also have increased pressures on competing South African producers. In the following section, we present evidence on the implications of these price decreases for production and employment in South African manufacturing industries.

3. Impact of imports from China on domestic output and employment in manufacturing

The strong increases in import penetration, particularly in the labour-intensive industries, combined with relatively low exports of manufactured goods, have fed concerns about the direct effects of Chinese competition on output and employment in the South African manufacturing sector. These concerns are illustrated in Figure 3, that plots changes in import penetration from China against log changes in sales volume (Figure A) and employment (Figure B) for 44 manufacturing industries. While there is significant variation across industries, the aggregate trend in Figure 3 suggests that the manufacturing industries that have been subject to greater competition from Chinese imports (reflected in larger changes in the level of Chinese import penetration) have generally registered smaller log changes (increases) in sales volumes and employment over the 2001-2010 period.

Figure 3: Plot of log change in sales volume and employment versus change in South African import penetration from China by manufacturing industry, 2001-2010



Source: Authors' own calculations using UN Comtrade data and Statistics South Africa data.

We analyse these relationships in Edwards and Jenkins (2013a, forthcoming) where we use a Chenery-style decomposition to separate out the direct contributions of domestic demand, exports, import penetration and productivity to changes in sales and output. There are many limitations to the decomposition approach. In particular, Chinese and South African products are assumed to be perfect substitutes, which will bias upwards estimates of output and employment losses attributed to rising import penetration.⁴ Nevertheless, the technique provides a useful benchmark against which to evaluate the potential relative importance of the different sources of change.

The decomposition results for the period 2001-2010 are presented in Table 4. Looking first at changes in outputs, we find that Chinese penetration of the South African market increased rapidly over the past decade, in part due to displacement of imports from other countries, but more importantly at the expense of local production. According to the decomposition, import penetration from China from 2001 to 2010 displaced R30 billion (2000 prices) of domestic manufacturing output (a 5 percent reduction from 2001 values). Alternatively, Chinese import penetration over this period caused manufacturing output in 2010 to be about 4.4 percent lower than it otherwise would have been. Losses in sales were particularly high in textiles and clothing, footwear and leather, electrical and electronic products and some types of machinery.

Exports of manufactures to China raised output, but only by 0.8 percent over this period. The contribution to output growth of exports to the rest of the world was mediocre (3.9 percent), leading to an overall negative net trade impact on output.

Table 3: Chenery Decomposition of Changes in South African Manufacturing Output and Employment, 2001-2010

	Output		Employment	
	(R billions, 2000 prices)	Share initial value (percent)	(Thousands)	Share initial value (percent)
Growth of Domestic Demand	120.6	19.9	208.9	16.6
Exports to China	4.7	0.8	4.1	0.3
Exports to ROW	23.3	3.9	10.0	0.8
Increased import penetration	-63.3	-10.4	-110.3	-8.8
(of which Chinese import penetration)	-30.3	-5.0	-77.8	-6.2
Net Trade	-35.3	-5.8	-96.3	-7.6
Productivity growth			-226.1	-18.0
Total Change	85.3	14.1	-113.5	-9.0

Note: Based on data used in Edwards and Jenkins (forthcoming). The impact of Chinese import penetration on employment is based on calculations of the displacement of domestic production after accounting for displacement of ROW imports by Chinese imports.

The net employment impact of international trade over the 2001-2010 period is also negative but larger than the reduction in output (- 96 000 jobs or 7.6 percent of initial levels). Two reasons underpin this outcome. Firstly, exports have been concentrated in relatively capital-intensive and resource-intensive industries. The direct employment opportunities created through these exports has thus been limited. Secondly, labour-intensive industries were particularly badly affected by imports from China. According to the decomposition,

⁴ The decomposition also ignores the inter-dependency between exports, import penetration, productivity and final demand (these are discussed in more detail in the source article).

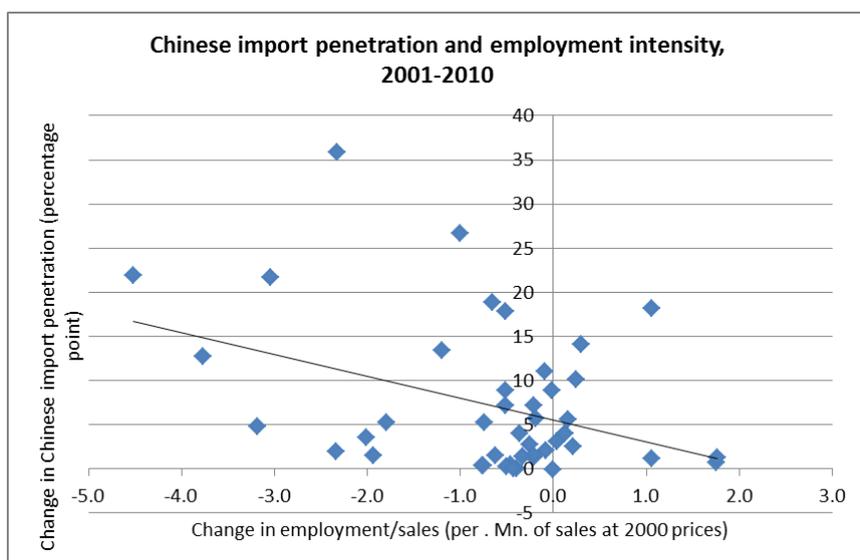
the displacement of domestic output by Chinese imports led to a reduction in just under 78 000 job opportunities (Table 4). Consequently, the negative impact on employment in manufacturing from imports was more than proportional to the output displacement.

Looking at the other sources of employment change, the main positive contribution to employment after 2001 came from the growth of domestic demand that raised employment by close to 17 percent. Table 4 also shows the loss of employment attributable to increased labour productivity, which is twice that attributable to increased import penetration.⁵

However, in Edwards and Jenkins (forthcoming) we find that some of the improvement in labour productivity is itself a response by firms to increased import competition from China through either 'defensive innovation' through the upgrading of capital stock and skills (Wood, 1994; Bloom et. al., 2011; Mion and Zhu, 2013), and/or the exit of less efficient firms (Bernard, Jensen and Schott, 2006). This is illustrated in the scatter plot in Figure 4 that shows relatively strong decreases in the employment intensity of production (inverse of productivity) in sectors that experienced relatively strong increases in Chinese import penetration.

Our econometric estimates suggest that 1 percentage point increase in Chinese import penetration is associated with a 0.5 percent increase in output per worker within the industry. The effect is even stronger in below median wage industries (coefficient of 1.04). The results also reveal that the productivity effects are closely associated with import penetration in intermediate inputs used by the sector. The outsourcing of production processes to foreign firms, as well as the importation of labour saving technology embodied in inputs, may explain this channel of influence. Overall, the regression analysis suggests that Chinese import competition may have contributed up to 14.5 percent of the jobs losses (33 thousand) attributed to improvements in labour productivity from 2001 to 2010 in the Chenery decompositions.

Figure 4: Chinese import penetration and employment intensity of production in manufacturing, 2001-2010



Note: Own calculations based on data used in Edwards and Jenkins (forthcoming).

⁵ The dominance of the productivity effects for manufacturing is similarly found by Edwards (2001a), Dunne and Edwards (2007) and Jenkins (2008).

To summarize, the relatively steep relationship between the change in Chinese import penetration and the change in employment in Figure 3 arises from the displacement of domestic production, and increases in labour productivity associated with Chinese competition. Both these effects were concentrated in relatively labour-intensive sectors.

4. Impact of imports from China on South African exports of manufactured goods

China's increased participation in foreign markets may also have an indirect impact on South African manufacturing through the export channel. On the one hand, rapid growth in Chinese demand for resources has raised world prices of these products, contributing towards rising terms of trade for resource abundant economies such as South Africa. Further, South African supermarket chains in Africa have benefited from the availability of cheap Chinese products that they sell.

On the other hand, Chinese exports of manufactured goods may 'crowd-out' South African exports in destination markets. In Edwards and Jenkins (2014) and Edwards and Jenkins (2013b), we use various approaches to calculate the impact of Chinese export competition on South African manufacturing exports in the sub-Saharan African (SSA) region, the EU and the US.

We find that competition between South Africa and China increased significantly over the past decade, particularly in African markets. This is shown in Table 4, that presents the share of the value of South African exports (at the 6-digit Harmonized System level) that faced competition from China in 1997 and 2010 (columns 1 and 2), as well as the proportion of the number of products for which there is an overlap (columns 3 and 4).

The greatest overlap is for products exported to the EU and the US where over 90 percent of South African manufactured goods (at the HS 6-digit level) face direct competition from Chinese products. The overlap was high in both periods (1997 and 2010). The strongest increase in overlap of products exported occurs in SSA markets, where South African firms disproportionately export their manufactured goods. In 1997 the proportion of products exported by South Africa to SSA which were also exported by China to the same market accounted for 11 percent of South African export items (at the HS 6-digit level). These products made up just less than 17 percent of the total value of South African exports to the region. By 2010 the overlap had risen to 55 percent of the number of products exported by South Africa and around 74 percent of the total value of South African exports.

Table 4: Share of South African manufacturing exports facing competition from China by export value and product count, percent

	Share value of SA exports with overlap		Share number of SA export products with overlap	
	1997 (1)	2010 (2)	1997 (3)	2010 (4)
EU	96.4*	98.8	94.6*	99.1
USA	71.1	97.7	94.8	98.0
SSA Total	16.8	73.8	11.0	54.7
Angola	9.2	78.9	8.7	65.5
Ghana	37.2	81.3	24.0	69.8
Kenya	18.0	74.1	25.3	71.6
Mozambique	7.7	72.3	5.5	50.9
Malawi	8.4	51.0	2.5	28.9
Nigeria	29.9	89.9	37.3	78.9
Tanzania	20.0	79.3	21.3	65.1
DRC	7.9	82.0	10.3	51.0
Zambia	10.3	76.4	5.2	45.6
Zimbabwe	24.7	64.9	11.2	41.0

Source: Edwards and Jenkins (2013b). Indicators are calculated using 6-digit HS level trade data obtained from UN Comtrade

Note: * data for 2000.

In Edwards and Jenkins (2013b) we extend a Constant Market Share (CMS) analysis to calculate the extent to which changes in the overall competitiveness of South African exports are attributable to changes in competitiveness vis-à-vis China. We focus on the period 2001 to 2010 when the Chinese impact was strongest. These estimates are presented in Table 5 and suggest that Chinese competition ‘crowded out’ South African exports of manufactured goods to the EU, US and the sample of SSA countries by around 8 percent. The effect was strongest for exports to the region where the crowding out effect was closer to 10 percent. The crowding out effects are slightly higher for South African than for Brazil, another regional power.

Table 5: Crowding Out of Brazilian and South African Exports by China, 2001-2010

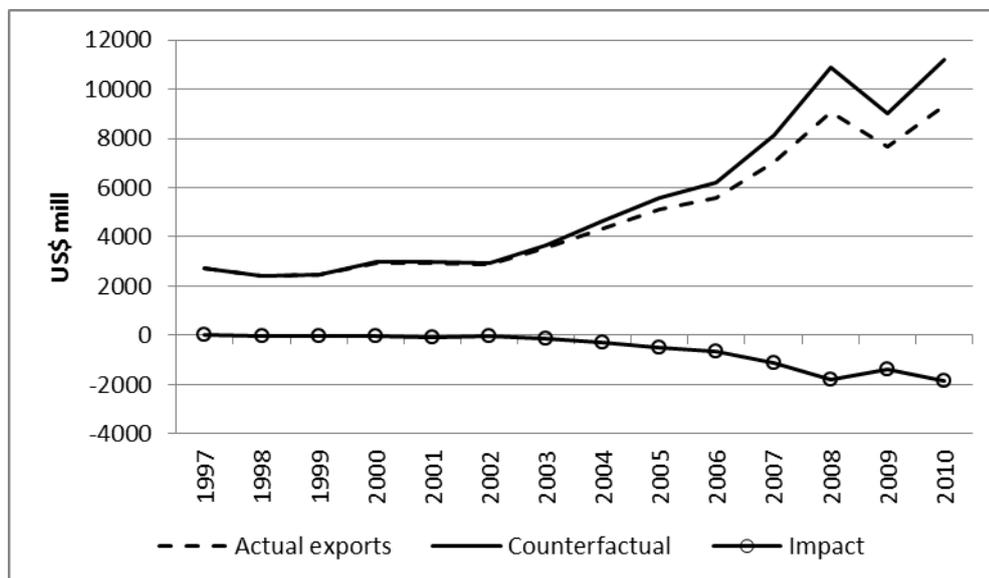
	Brazil	South Africa
US	-12.5%	-5.6%
EU	-3.8%	-7.8%
Regional Market*	-8.1%	-9.9%
Total	-7.4%	-8.1%

Source: The results for South Africa are obtained from Edwards and Jenkins (2013b). Additional calculations using the same method are presented for Brazil. The regional market for South Africa consists of the 10 SSA countries listed in the previous table. For Brazil the regional market comprises 7 Latin American countries (Argentina, Chile, Colombia, Mexico, Paraguay, Uruguay and Venezuela).

In Edwards and Jenkins (2014) we use an alternative approach where we extend the gravity model approach used by Eichengreen et al. (2004). We find that South African exports of new and existing manufactured products to Sub-Saharan Africa have been negatively affected by Chinese competition relative to exports from other countries. Consequently, South Africa’s exports to the region in 2010 were 20 percent lower than they would have been if they had been affected to the same degree as other countries. The crowding-out effects are found to be strongest in medium- and low-technology products. An implication of these results is that China has diminished South Africa’s relative presence in the SSA markets, as measured by manufacturing

exports. South African exports to SSA nevertheless increased from 2001 so that “crowding out” should be interpreted in relative terms (Figure 5).

Figure 5: South African actual, counterfactual and ‘crowded-out’ exports of manufactured goods to SSA



Source: Edwards and Jenkins (2014)

Conclusion

This paper draws on various research papers that analyse the competitive effects of Chinese trade on South African manufacturing industries. The results suggest that increased import penetration from China has diminished South African manufacturing output and employment. The effect on employment in manufacturing is larger, because the declines in output were concentrated on labour-intensive industries, and because the increase in imports raised labour productivity within industries. Further, we present evidence that Chinese competition has crowded out’ South African exports of manufactured goods to the EU, the US and the sample of SSA countries by around 8 percent from 2001 to 2010, with stronger effects on exports to SSA.

This paper has focused mainly on the ‘threats’ and not the positive effects associated with Chinese competition. For example, cheaper access to capital and intermediate inputs imported from China boost profitability of domestic production. The productivity responses by domestic firms to increased competition together with the elimination of inefficient firms may have left the South African manufacturing industry better placed for expansion in future. While losses in employment within manufacturing associated with Chinese competition have received much attention, some of these losses have been offset by increases in employment in the services industry, as, for example, is apparent in the clothing retail sector (Morris and Einhorn, 2008). Lower priced imports also raise consumer welfare, particularly in relatively poor households that spend a disproportionate share of their income on traded goods. By reducing inflation, Chinese imports may have helped to keep interest rates low. Further, while Chinese competition has crowded out South African manufacturing exports, total exports have nevertheless increased. Exporters of primary products and resource-based manufactures have also benefited from higher international prices driven by Chinese growth. These effects have not yet been fully researched and need to be considered if the economy-wide implications

of Chinese imports on the South African economy are to be assessed. Ideally, such an analysis should draw on firm data to fully capture the dynamics of adjustment at the firm level.

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