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Csilla Lakatos*
Center for Global Trade Analysis, Purdue University,
and U.S. International Trade Commission

Tani Fukui*
U.S. International Trade Commission

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Address correspondence to:
Office of Economics
U.S. International Trade Commission
Washington, DC 20436 USA

The Liberalization of Retail Services in India: a CGE model

CSILLA LAKATOS*¹ AND TANI FUKUI^{†2}

¹*Center for Global Trade Analysis, Purdue University*

²*US International Trade Commission*

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Abstract

In order to address the significant increase in importance of FDI and of MNC-related policies, we develop an extended GTAP model and associated global database that accounts for both foreign direct investment and multinational companies differentiated by the region of ownership. The model is calibrated on the GTAP v8 database augmented by global foreign affiliate statistics data described in Fukui and Lakatos (2012) and the FDI stocks data of Boumellassa et al. (2007). To illustrate the model's behaviour, we examine the recent policy debate with respect to allowing foreign direct investment in multi-brand retailing in India. We find that the

*Corresponding author. Csilla Lakatos (clakatos@purdue.edu) is a Research Economist at the Center for Global Trade Analysis at Purdue University and a Visiting Fellow at the U.S. International Trade Commission.

[†]Tani Fukui is an economist at the U.S. International Trade Commission from the Office of Economics. The views expressed in this paper are strictly those of the authors and do not represent the opinions of the U.S. International Trade Commission or of any of its Commissioners.

unilateral reduction of barriers to FDI in distribution services in India benefits the economy as a whole, consumers and foreign producers but hurts domestic distributors. Nevertheless, when we consider the associated productivity improvements documented in the literature to downstream and upstream industries, we find that domestic producers are expected to benefit from the liberalization of the distribution sector as well.

JEL Classification: **F23 C68**

1 Introduction

Nationwide protests erupted in December 2011 in India against the government's decision to allow 51 percent foreign direct investment (FDI) in multi-brand retailing, with protestors labeling FDI a "fast death instrument" for the Indian economy. As a result of the intense political and social pressure, the Government of India revoked its decision to allow global supermarket chains such as Wal-Mart, Carrefour or Tesco to set up business in India. In 2012, the Cabinet revived this policy and it has once again become a hot debate. Many questions have been raised by this debate: at the aggregate level, is FDI in retail services good for India? What benefits, and costs, should the Indian government expect? What is the magnitude of the effect? Who will win and who will lose? We address some of these issues in this paper.

The debate over liberalizing barriers to foreign investment in India is not a new one. The 2011 policy proposal was made sixteen years after the first time it was proposed, and has been blocked numerous times by those portions of the economy fearing negative consequences¹. Foreign investment policy changed dramatically with the economic reforms of 1991 which liberalized many of the highly protected public sectors by removing entry barriers to private participation and by allowing foreign investment in 35 high-priority manufacturing sectors. While these measures managed to attract foreign investment and

¹As reported in "UPA Opens doors for global retailers" in the *Times of India*, November 25, 2011.

technology in manufacturing sectors it capped foreign ownership at 51 percent and left most of the services sectors including retailing, highly protected. Since 1991, barriers to foreign investment were further relaxed. This included progressive de-licensing, allowing 100 percent foreign ownership in certain sectors, and broadening the liberalized sectors to include services.

In 1997, 100 percent foreign ownership was permitted in FDI in "cash and carry" and wholesale trading. Single brand retailing was opened to foreign investment in 2006 but the rate of foreign participation was capped at 51 percent. This limitation was finally removed in November 2011 at the same time the government attempted to allow 51 percent ownership in multi-brand retailing. The multi-brand retailing measure was met with strong opposition of the different stakeholders and was reversed after only four months.

On the one hand, permitting the entry of foreign retailers is seen to threaten the existence of millions of small traditional stores and street vendors that dominate the Indian retailing industry. On the other hand, foreign retailers can improve the efficiency of the retail services industry and therefore lower prices for Indian consumers while bringing investment and know-how.

Many observers anticipate the main losers of liberalization to be the small independent shop owners and possibly their employees, as well as traders and middlemen that service the independent shop owners. Winners of the new policy potentially include customers who may face lower prices, and farmers who would receive a greater share of the final consumer price and may benefit from the productivity improvements imposed or encouraged by foreign retailers.

The academic literature has attempted to quantify the effects of FDI liberalization in a number of ways. There are two distinct lines of research. The first examines econometrically the effects of FDI on countries. This literature is predominantly concerned with the productivity improvements that may be generated by FDI in the host country. The second set of literature examines FDI in the context of the general equilibrium modeling. In this study, we examine both aspects, using the direct effects of FDI estimated by the

econometric literature to obtain quantified effects on the broader global economy.

This study sheds light on whether opening up multi-brand retailing and more generally trade to foreign investors in India would indeed be a "fast death instrument" in harming certain sectors or stakeholders. We quantify the economic impacts of the removal of barriers to foreign investment in a comparative static computable general equilibrium (CGE) framework developed exclusively for better representing multinationals and FDI. More specifically, we develop an extended GTAP model and associated global database that accounts for both foreign direct investment and multinational companies differentiated by the region of ownership which use different production technologies to produce a given a good. The model is calibrated on the GTAP v8 database augmented by global foreign affiliate statistics data described in Fukui and Lakatos (2012) and the FDI stocks data from Boumellassa et al. (2007). We find that the unilateral reduction of barriers to FDI in distribution services in India benefits the economy as a whole, consumers and foreign producers but hurts domestic distributors. Nevertheless, when we consider the associated productivity improvements documented in the literature to downstream and upstream industries, we find that domestic producers are expected to benefit from the liberalization of the distribution sector as well.

The rest of the paper is organized as follows. Section 1 introduces the paper and Section 2 reviews some of the existing literature on the advantages and disadvantages of allowing FDI in multi-brand retailing. Section 3 and Section 4 describe in detail the modeling framework and the databases used in calibrating the model. Section 5 provides details about the design of the simulations carried out in the paper while Section 6 analyzes the economic impact of the elimination of the barriers to FDI in retailing in India. Finally, Section 7 concludes.

2 Background and Literature Review

2.1 India's Retail Services Sector

The distribution sector, including both wholesale and retail, is one of most important sectors of the Indian economy, accounting for 16 percent of GDP and 14 percent of total employment². It is also growing rapidly: according to some industry experts, the retail services sector expects an 11-15 percent annualized growth rate over the next several years³.

Despite the growth, foreign multinational firms face daunting challenges in the Indian economy. A unique feature of the Indian retail sector is the small share of "organized retail" in the sector. The term organized retail is used to denote branded stores with multiple outlets. Foreign multinationals, if they are permitted to enter the market, would fit within this category; however, even domestic organized retail firms have had very little luck obtaining market share. McKinsey & Company (2008) estimated the 2007 share of organized retail to be 4-5 percent of total retail sales, and Singh and Mall (2011) estimated the 2010 share to be 6-7 percent; permitted foreign retailers (i.e. single-brand retailers) take up only a fraction of this share⁴.

The penetration of the organized varies by good. Food is particularly confined to the unorganized retail sector, relative to other goods. According to Sharma (2011), less than 1 percent of food was sold in organized retail stores, while 19 percent of clothing and footwear was sold in organized retail stores.

²Central Statistics Office estimates for 2008-2009

³McKinsey & Company (2008) and Singh and Mall (2011).

⁴This can be contrasted with other countries, even other developing countries, where the share of organized retail is substantially higher: Sharma (2011) reports China has a 20 percent penetration of organized retail in the retail sector, while Vietnam has a 22 percent penetration, and Brazil a 36 percent penetration.

2.2 Liberalization and Controversy

Foreign investment policy was dramatically liberalized beginning with the economic reforms of 1991 which liberalized many of the highly protected public sectors by removing entry barriers to private participation and by allowing foreign investment in 35 high-priority manufacturing sectors. While these measures managed to attract foreign investment and technology in manufacturing sectors, the policy capped foreign ownership at 51 percent and left most of the services sectors, including retail services, highly protected. Since 1991, barriers to foreign investment were further relaxed by progressive de-licensing and allowing 100 percent foreign ownership in certain sectors.

Firms in "cash and carry" and wholesale trading have been permitted to have 100 percent foreign ownership since 1997. Single brand retailing was also opened up to foreign investment in 2006 but the rate of foreign participation was capped at 51 percent.

In 2011, liberalization of multi-brand retail was contemplated in earnest. In the first formal step toward a policy change, the Cabinet of India approved measures to permit majority ownership in multi-brand retail firms on November 24, 2011⁵. The proposed changes included permitting up to 51 percent foreign ownership in multi-brand retail as well as 100 percent ownership in single brand retail. Several restrictions were proposed alongside this liberalization, including small and medium sized business content requirements for the foreign retailers, as well as and geographic restrictions on store locations. Moreover, the policy implementation depended on the further approval of state governments. However, the uproar from various interested parties, particularly traders and politicians, against this policy almost immediately forced the Cabinet to suspend the decision only a few weeks later⁶. On September 14, 2012 the Cabinet revived this policy but as of November 2012 it had not yet been formally adopted⁷.

⁵Times of India, "UPA opens the door for global retailers", November 25, 2011

⁶The decision was suspended on December 7, 2011. Times of India, "FDI in retail put on hold", December 7, 2011.

⁷Cited in *Economic Times*, September 14, 2012. "FDI in retail: Anand Sharma announces relaxation of norms for single brand." Formal adoption of foreign investment policy is made via "Press

There has been a substantial discussion in the popular press and industry experts about the potential costs and benefits to various sectors in the economy. There are many groups who fear losing out as a result of FDI in retail. The small traditional stores and street vendors that dominate the Indian retailing industry are threatened by the potential competition of foreign owned organized retail. Although small firms are expected to lose market share, they may still see continued sales growth as the total retail sales sector is expected to expand.

Another major concern raised by the entry of foreign retailers is labor displacement and wages. The retail sector is major employer in the Indian economy, and disruptions to employment and wages can have serious implications for other segments of the economy. Additionally, labor movement is a politically sensitive topic, and politicians are loath to implement policy changes that may cause even temporary uncertainty in the labor market.

Finally, the liberalization of FDI may threaten the workers in the many links in the supply chain between farmer (or producer) and retailer. These may be cut out of the supply chain as foreign retailers establish direct links between themselves and farmers and other producers. Less drastically, they will face pressure on their profit margins as foreign multinationals begin to push for increased efficiency from the supply chain.

On the other hand, competition from foreigners could also be a driver of improvements in the productivity of the retail sector. Foreign organized retailers may be able to lower prices for Indian consumers and improve the efficiency of the retail services industry while bringing investment and know-how to India. Upstream suppliers - farmers, in particular - are expected by many observers to gain from FDI. Much store is set by Wal-Mart and other firms' attention to so called "farm-to-fork" strategies, whereby the retail firm selects and guides promising farmers toward more productive technologies⁸. In addition to productivity improvements, there is an enormous amount of waste in the supply chain

Notes" issued by the Department of Industrial Policy and Promotion (DIPP (2010)), Government of India. See Palit (2009). The Press Notes are posted to the DIPP website upon adoption. <http://dipp.nic.in/English/Policies/Policy.aspx>

⁸Times of India (2011). FDI in Retail: War-mart. December 3, 2011.

between farm and consumer, with an estimated \$10 billion worth of farm produce going to waste between the two points. This amounts to approximately 35-40 percent of fruits and vegetables and about 10 percent of food grains⁹. It is hoped that foreign-owned retailers will tackle this problem as well by investing in cold-chain transportation and storage facilities to eliminate such waste.

Improvements in the supply chain are expected to be at least partially passed on to consumers. Various experts have claimed cost savings of between 3 and 6 percent¹⁰. Other observers such as Chand and Ganguly (2011) have expressed the expectation that the periodic episodes of food inflation may in part be mitigated by improvement in supply chain management. Although the estimated price changes are not large and may be smaller than inflation rates, improved linkages between farm and consumer can improve supply management.

Finally, consumers are expected to benefit through improvements in price, quality and access to a wider range of varieties. Existing research (e.g. Joseph et al. (2008)) has found that while foreign firm entry in organized retail is associated with an increase in purchasing power across all income groups, lower income consumers benefit the most.

Much of the commentary in the popular press discusses improvements to agricultural productivity as a results of liberalizing the retail services sector. In our paper as well, we focus our attention on the backward linkages to agriculture. This is understandable because food is the sector that is least often sold through the organized sector and may benefit the most. However, other goods such as furniture and apparel are currently being sold through organized retail firms at a much higher rate than agricultural products, and liberalization may affect these sectors as well. Future work would benefit from analyzing

⁹Times of India (2011). FDI in Retail: War-mart. December 3, 2011.

¹⁰Times of India (2011). FDI in Retail: War-mart. December 3, 2011. In 2011, BCG co-authored a report ("Building a New India: The Role of Organized Retail in Driving Growth") with the Confederation of Indian Industry, a broad-based industry association of over 7,100 Indian-based firms of all sizes and industries. This report estimated that consumer costs would decline by an average of 4-6 percent. Kishore Biyani, a prominent retail entrepreneur also cited in the Times of India article, estimates that prices in the organized sector are on average 3-4 percent lower than in kiranas (small independent local shops).

the liberalization effects of distribution on other sectors.

2.3 Economic Literature

A dominant theme in the economic literature is the search for knowledge spillovers generated by FDI. The essential thesis is that a foreign firm with world-class expertise in a particular sector will provide - deliberately or inadvertently - knowledge to the host country and will thereby provide a productivity boost to firms in that country. Despite a wealth of anecdotes and a general acknowledgement that knowledge transfers occur (see e.g. Javorcik and Tybout (2008) and Lipsey (2002)), there have been mixed results in attempts to quantify the effect. The major literature review by Lipsey (2002) finds that evidence of "knowledge spillovers" is not so clear, and depends on a variety of factors as explained below.

Stage of development seems to matter: studies of developed countries tend to show positive spillovers while studies of developing countries do not. The analysis by Keller and Yeaple (2009) obtains positive spillovers for U.S. inward FDI, as does Haskel and Slaughter (2007) for the UK. These are both for developed countries as hosts; for developing countries many studies obtain either negative or insignificant spillover effects. Aitken and Harrison (1999) for Venezuela, Javorcik and Spatareanu (2008) for Romania and Blalock and Gertler (2008) for Indonesia did not find positive same sector spillovers.

Alfaro and Chen (2012) examine knowledge spillovers in combination with "selection" issues. They note that there are several forces that may affect average productivity. First, domestic firms may be learning from foreign firms in the same sector. Second, domestic firms may be persuaded to be more efficient due to increased competition. This would also appear as a productivity increase but represents something less than a knowledge spillover. Third, increased competition will push out the least productive firms. This again does not necessarily imply knowledge spillovers per se. Alfaro and Chen (2012) aim to disentangle two of the possible sources of average productivity improvement: knowledge spillovers and the increased competition produced by FDI. They find that same sector knowledge spillovers are estimated to account for the majority of the productivity improvement.

The effects of FDI on host economies manifest themselves in other measures as well. Lipsey (2002) finds that there is substantial evidence that wages increase as a result of increased FDI. Foreign-owned firms are more productive, and this higher productivity permits them to recruit workers at above market rates. On the other hand, at least one article has found the opposite to be true: Chari and Raghavan (2012) find that each Wal-Mart worker replaces approximately 1.4 retail workers while pushing down wages. Economic growth is associated with increases in FDI, as noted by Chakraborty and Nunnenkamp (2008), Blonigen and Wang (2004), and Alfaro et al. (2010). In our paper we focus on productivity effects which are the root cause of most other observed effects.

3 Modeling Framework

On the one hand, FDI is associated with the international mobility of capital and on the other hand, FDI implies firms operating across national borders. In our modeling of FDI in CGE we cover both of these aspects.

The pioneering work of Petri (1997) laid the groundwork for many subsequent CGE models representing foreign direct investment. The Petri model was the first to consider foreign commercial presence in a CGE framework. It employed the Armington assumption of national product differentiation to distinguish between product varieties differentiated not only by the firm location but also by firm ownership. The standard GTAP model distinguishes product varieties by firm location only. In addition, Petri defines investor preferences as a nested imperfect transformation function that allocates a given investment budget across sectors and regions.

Examples of CGE models that use a Petri-type specification of FDI are FTAP (Hanslow et al., 2000), the Michigan model (Brown and Stern, 2001), MIRAGE (Bchir et al., 2002) and WorldScan (Lejour et al., 2006). The FTAP model is a version of the standard GTAP model which incorporates FDI based mostly on the assumptions of Petri. A key difference lies in the ordering of choices among regions of location and ownership (modified Petri assumption): FTAP assumes that foreign affiliates located in a given region are

closer substitutes for domestic firms located in that region than they are for the firm of the region of ownership (parent company) while the Petri specification implies that firms with the same region of ownership are closer substitutes for each other irrespective of location. Brown and Stern (2001) also use a modified Petri assumption to incorporate FDI in the Michigan Model of World Production and Trade. Lejour et al. (2008) use the same framework to analyze the liberalization of the EU services market with the WorldScan model.

The specification of FDI we propose follows closely that of Petri (1997) and Hanslow et al. (2000). One major difference compared to the existing literature arises from the fact that we represent heterogeneous production technologies for firms differentiated by the region of ownership. While this assumption has been already considered in the single-country CGE literature such as Jensen et al. (2007), Rutherford and Tarr (2008), Latorre et al. (2009) and Latorre (2010), it is a significant improvement on existing modeling techniques in the global CGE literature.

The next subsections describe the structure of investor preferences and the structure of supply. We briefly describe the relevant features of the GTAP model, the differences introduced by our model, and their implications.

3.1 Mobility of capital

GTAP is a real assets model. That is, investment is only associated with equity rather than debt and there is no explicit financial market structure in the model. In the standard GTAP model the "global trust" collects the savings of all the regional households and allocates it on their behalf to capital investment. Capital markets clear globally, and capital is assumed to be internationally mobile.

For the specification of the supply of FDI we use the same constant elasticity of transformation (CET) function as in Petri (1997). The capital owner's goal is to maximize net wealth subject to diversification constraints. Total wealth is distributed across sectors and regions as a function of relative rates of return subject to the diversification constraints imposed by a CET function. Total supply of capital in region r is then allocated to

domestic/foreign regions and sectors based on a constant elasticity function determined by relative rates of return. Average rate of return is a weighted sum of rates of return on assets across destinations. Rates of return are the ratio between the rental price of capital and the price of capital goods. Note that we do not represent explicit dynamics as this specification would imply intrinsic dynamics of savings and capital accumulation. McDougall (1993) derives accumulation equations that express end-of-period wealth as a function of the saving ratio, real income and prices.

3.2 Foreign commercial presence

The traditional Armington assumption used in most CGE models to specify international trade flows implies that products are differentiated only by the country of production. When considering the specification of FDI, however, the distinction between firm location and firm ownership becomes important. The novelty in our specification of foreign commercial presence lies in that we move away from the representative firm assumption as we are able to explicitly represent firms differentiated by the region of ownership that use different production technologies in producing a good.

3.2.1 The structure of aggregate demand

In the standard GTAP model, economic agents such as consumers, producers and government allocate expenditure between domestically produced and imported goods. The sourcing of imports occurs at the border. In the FDI version of the model, demand is more complex as it is complemented with an additional level of nesting representing the country of ownership. Suppose Figure 1 describes the structure of U.S. aggregate demand for retail services. In a first stage, firms and consumers allocate expenditure between domestically produced and imported retail services. Then, in a second stage (at the border), expenditure on imported cars is allocated across varieties produced by each trading partner. Finally, imported cars are allocated across ownership categories to various multinationals.

3.2.2 The structure of supply

Compared with the standard GTAP model where in a given region and sector there is one representative firm that produces a single consumption good, in the GTAP model with FDI we differentiate between domestic firms and foreign owned affiliates of multinational companies that produce a composite consumption good. As represented in Figure 2, for instance domestic supply of retail services in the US is a composite output of both domestic (Wal-Mart and Amazon) and foreign owned firms located in the US. Foreign owned firms located in the US are further differentiated by the country of ownership (affiliates of Japanese MNCs such as Uniqlo, affiliates of British MNCs such as Topshop or Marks&Spencer etc. that operate in the US). Further, each of these firms combine value added and intermediate inputs using a Leontief technology to produce a good. Our proposed specification implies that intermediate inputs (just as final demand) are differentiated not only by the regions of firm location, but also by the region of firm ownership.

From a modeling point of view, this implies the following modifications to the specification of the supply side. Instead of one representative firm that produces a commodity i combining intermediate inputs and value added, in this specification total output is a composite of the output of domestic and foreign affiliate firms. Further, the output of foreign affiliates in region r is a composite of the output of different firms owned by different regions s . Firms' technology differ by value added intensity.

4 Data Sources

Overall, the specification of FDI described here requires the following data:

- capital stocks disaggregated by region of ownership/location and sector
- cost and sales structure of domestic firms and foreign affiliates

Bilateral and sector specific FDI stocks data is available at the GTAP sector/region aggregation (Boumellassa et al., 2007). Data on the cost and sales structure of foreign

Figure 1: The structure of demand with foreign commercial presence

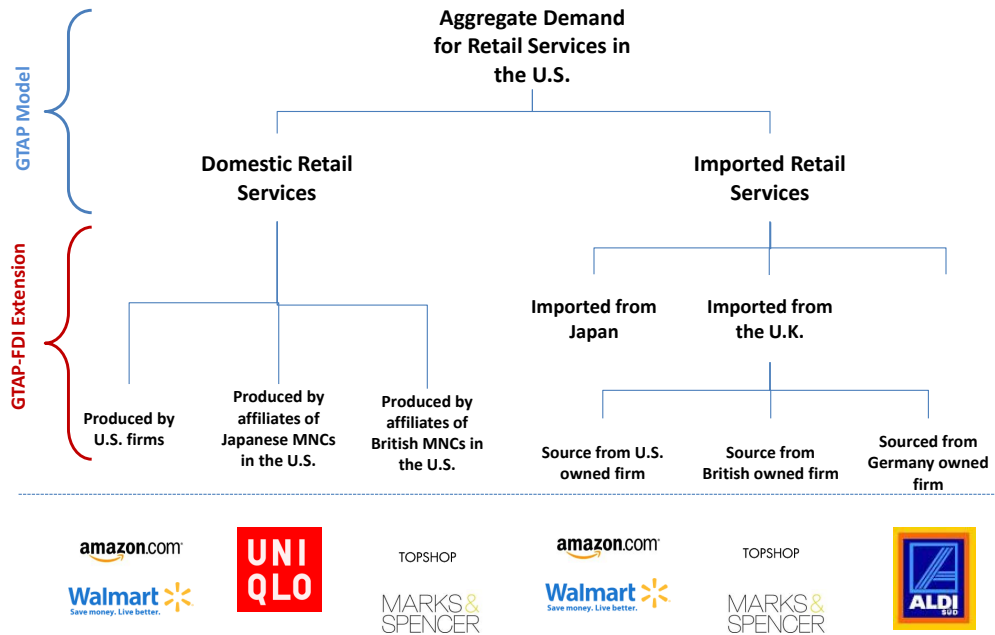
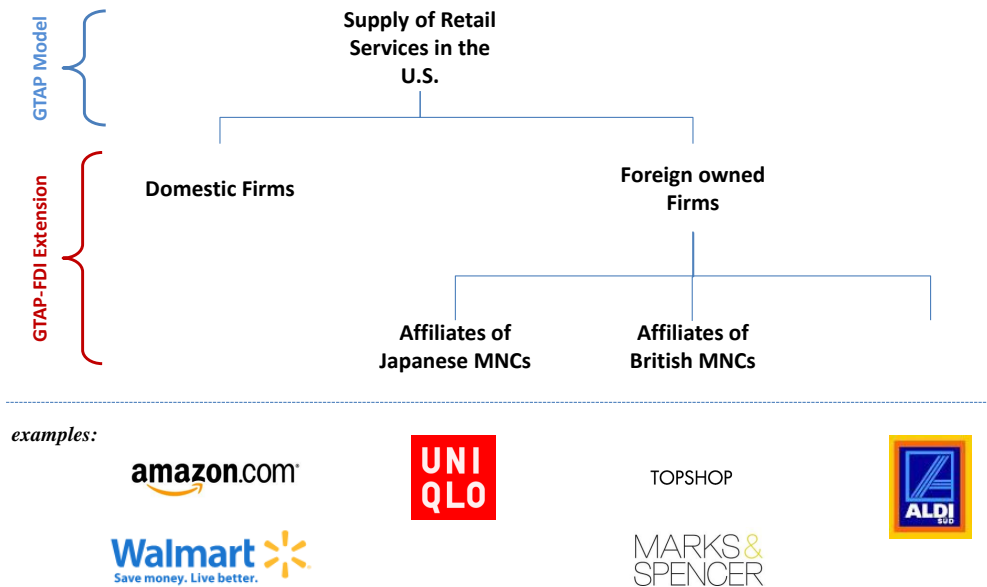


Figure 2: The structure of supply with foreign commercial presence



affiliates originates from (Fukui and Lakatos, 2012).

The lack of available data on the activities of foreign affiliates has often compelled researchers to use FDI data as a proxy for foreign affiliate operations data. Many existing CGE studies use FDI stocks/flows data to infer structural information about the production characteristics of foreign firms as well as their sales patterns. Nevertheless, as pointed out in Beugelsdijk et al. (2010), FDI stocks are a biased measure of FAS as the degree to which they over- or underestimate the activity of multinational varies with host-country characteristics. More specifically, FDI statistics measure only movements of capital between direct investors and their affiliates, and not funds from unaffiliated persons. This can lead to an underestimation of the activity of foreign affiliate activity in countries with well-developed financial markets. In addition, FDI in countries that are tax havens generate no actual productive activity - leading to an overestimation of the activity of foreign affiliates in these countries. Finally, variation in labor productivity across countries leads to an overestimation of affiliate activity in countries where labor is more productive and underestimation where labor is relatively less productive.

The data collection/estimation and building efforts with respect to the activities and technology used of foreign affiliates by Fukui and Lakatos (2012) now allows us to significantly improve on existing modelling specifications of MNCs in CGE. As a result, we now produce a GTAP database that is disaggregated to include not only capital stocks disaggregated by industry, host and source country but also domestic and foreign firms disaggregated by region of ownership and use heterogeneous production technologies.

In the next sections, we provide further details about the structure of the data used to disaggregate the GTAP database at the level of aggregation chosen for our simulations.

4.1 FDI stocks data

FDI data documented in Boumellassa et al. (2007) is used to disaggregate capital stocks by industry, host and source country in the GTAP database.

A closer look at the data reveals interesting findings. As illustrated in Table 1, aggregate world FDI stocks amounted to \$12.4 trillion in 2004. As a region, the EU27 is

the most significant host and source of FDI with 53% and 47%, respectively followed by the US and the rest of the world. With respect to the distribution sector (Table 2), the pattern follow that of the global FDI stocks. A sectoral decomposition of the data further shows that distribution services account for 6.7% of total FDI stocks.

India as a host attracted FDI stocks worth \$43 billion but it is not a significant source of FDI (\$10 billion).

Table 1: FDI stocks and turnover of affiliates: a comparative view (USD million)

	Total by host			Total by source		
	Turnover	FDI stocks	Share	Turnover	FDI stocks	Share
USA	3,616,247	2,751,935	0.76	5,522,695	3,215,075	0.58
China	530,903	523,856	0.99	151,551	52,370	0.35
India	157,370	43,103	0.27	54,141	10,084	0.19
East Asia	1,745,425	679,587	0.39	2,277,923	895,024	0.39
ASEAN	1,047,444	318,293	0.30	440,208	127,121	0.29
AusNz	671,009	312,270	0.47	572,950	216,800	0.38
EU27	7,838,070	5,938,146	0.76	8,741,512	6,685,702	0.76
ROW	5,686,533	1,866,477	0.33	3,532,020	1,231,493	0.35
Total	21,293,000	12,433,667	0.58	21,293,000	12,433,668	0.58

Source: Boumellassa et al. (2007) and Fukui and Lakatos (2012). FDI stocks data reflect 2004 values, while turnover data are averages for the period 2004-2007

Table 2: FDI stocks and turnover of affiliates in the distribution sector (USD million)

	Total by host			Total by source		
	Turnover	FDI stocks	Share	Turnover	FDI stocks	Share
USA	1,125,588	202,879	0.18	1,247,561	206,751	0.17
China	43,474	23,494	0.54	21,280	2,401	0.11
India	10,851	1,903	0.18	19,623	442	0.02
East Asia	448,843	49,158	0.11	53,135	64,182	0.09
ASEAN	173,504	17,534	0.10	159,380	6,533	0.04
AusNz	66,590	29,756	0.45	42,493	15,083	0.35
EU27	2,677,116	392,989	0.15	2,294,176	425,303	0.19
ROW	765,427	110,439	0.14	773,746	107,457	0.14
Total	5,311,393	828,152	0.16	5,311,393	828,152	0.16

Source: Boumellassa et al. (2007) and Fukui and Lakatos (2012). FDI stocks data reflect 2004 values, while turnover data are averages for the period 2004-2007

4.2 Foreign affiliates' turnover (sales) data

Table 1 reports the structure of total turnover of foreign affiliates by host and source country in all sectors of the economy. Aggregate turnover of all affiliates is shown to be \$21.29 trillion. Overall, most important source countries are the EU27 and USA accounting for 41% and 25% of the total outward turnover of foreign affiliates. On the other hand, EU27 countries are host to 36% of the total inward turnover of foreign affiliates followed by the ROW (26%) and the US (20%).

As shown in Table 2, the distribution sector accounts for a significant share of the global turnover of foreign affiliates with \$5.3 trillion or 24.9%. EU27 and US foreign affiliates add up to 50% and 21% of total inward sales and 43% and 23.5% of total outward sales, respectively.

As for FDI stocks, India is not a significant host or source of foreign affiliates sales

in the global economy. Further, we find that distribution only accounts for only 6% of total inward affiliate sales in India - significantly below the world average of 24.9%. This finding points toward the fact that India is among the most highly protected economies in distribution services in the world only topped by Tunisia, Jordan and Indonesia (see Figure 3).

4.3 Foreign affiliates value added data

Apart from using affiliates' sales data to disaggregate production and sales in the GTAP database, we also use information about labour and capital shares in order to make inferences about the production technology of foreign affiliates.

The construction of the value added database is described in detail in Fukui and Lakatos (2012). The database provides information about labour (and implicitly capital) shares in total value added by industry, host and source country. As illustrated in Table 3 for instance, the share of labour in total value added varies significantly by host and source country in the distribution sector ranging from 31% for ASEAN's affiliates located in EU27 countries to 72% for Australia and New Zealand's affiliates located in ASEAN countries.

Representing heterogeneous production technologies for foreign affiliates is a novel approach that is first employed in this paper (as far as we are aware) and is a significant improvement on the existing modelling techniques.

Table 3: Share of labor in total value added in the trade sector

host/source	USA	China	India	East Asia	ASEAN	AusNz	EU27	ROW
USA	-	0.48	0.41	0.49	0.50	0.45	0.35	0.40
China	0.48	-	0.59	0.66	0.68	0.69	0.45	0.56
India	0.41	0.59	-	0.59	0.60	0.61	0.47	0.50
East Asia	0.45	0.67	0.59	-	0.71	0.70	0.45	0.60
ASEAN	0.47	0.59	0.52	0.57	-	0.60	0.31	0.46
AusNz	0.50	0.68	0.61	0.67	0.72	-	0.41	0.54
EU27	0.34	0.45	0.52	0.52	0.61	0.56	-	0.52
ROW	0.53	0.65	0.57	0.66	0.67	0.68	0.49	-

Source: Fukui and Lakatos (2012)

5 Simulation design

The model is calibrated on the GTAP v8 database complemented with global foreign affiliate statistics data described in detail in Fukui and Lakatos (2012) and the FDI stocks data Boumellassa et al. (2007). For the purposes of this paper, regions have been aggregated into 8 composite ones comprised of India, United States, China, EU27, East Asia, ASEAN, Australia and New Zealand, and the Rest of the World. The sectoral aggregation is built around 6 sectors of interest: agriculture, mining, manufactures, distribution services, transportation, and other services.

To simulate the impact of the removal of barriers to FDI foreign commercial presence in the distribution sector we develop few potential scenarios of liberalisation:

- unilateral liberalisation (75% of existing barriers¹¹) of barriers to foreign commercial presence in the distribution sector in India examined in three progressively representative scenarios:

¹¹We start from the assumption that full liberalisation of the distribution sector would be politically and socially infeasible.

- **Scenario 1a (S1a)**: unilateral liberalisation of barriers to foreign commercial presence in the distribution sector in India;
- **Scenario 1b (S1b)**: S1a + an accompanying productivity spillover to the domestic distribution sector in India;
- **Scenario 1c (S1c)**: S1b + an associated productivity gain in upstream supplying industries (agriculture) in India;
- multilateral liberalisation (75% of existing barriers) of barriers to foreign commercial presence in the distribution sector worldwide: **Scenario 2 (S2)**.

5.1 The nature of barriers to FDI and MNCs

While restrictions on the international movement of capital and operations of multinational companies have been declining over the years, there are still significant barriers that remain.

Internationally, FDI is mostly regulated by an extensive web of preferential investment treaties: as of 2010 the number of international investment agreements (IIA) reached a total of 6,092, among which there were 2,807 bilateral investment treaties (BITs), 2,976 double taxation treaties (DTTs) and 309 free trade agreements (FTAs) with provision with respect to liberalisation of FDI (UNCTAD, 2011).

Based on the classification developed by UNCTAD (1996) we distinguish three broad categories of measures that have an impact on foreign investment and the operations of MNCs:

- measures relating to entry and establishment such as closing certain sectors to FDI; minimum capital requirements; screening, authorisation and registration of investment or restrictions on forms of entry (mergers and acquisitions might not be allowed) etc.
- measures relating to the ownership and control would include barriers such as restrictions on foreign ownership; compulsory joint ventures; restrictions on foreign shareholders' rights; restrictions on the licensing of foreign technology etc.

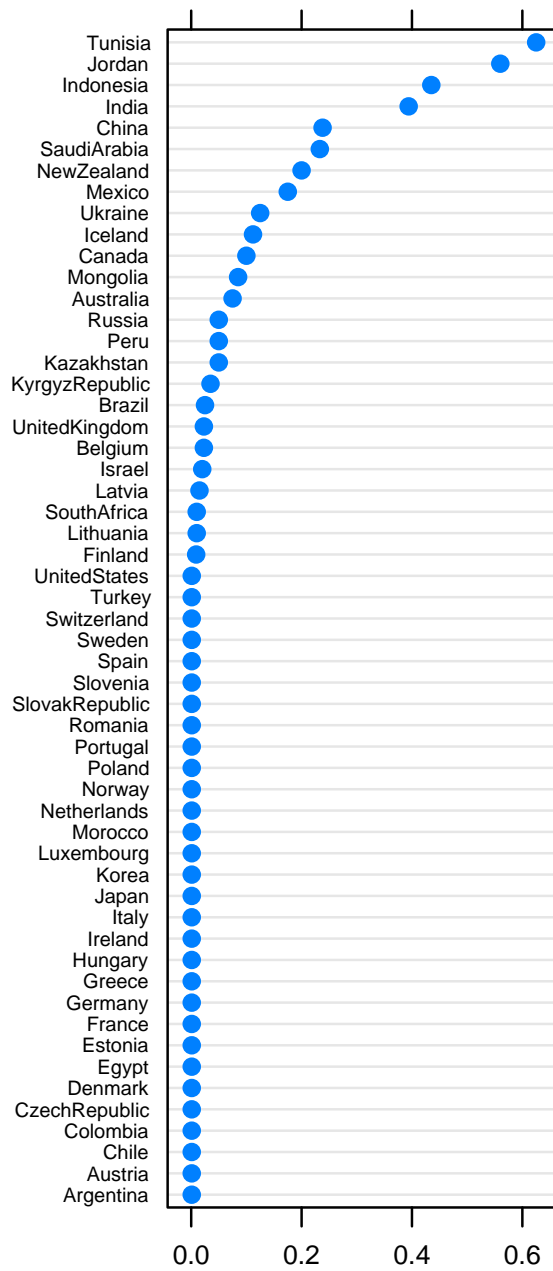
- measures relating to ongoing operations of multinational companies such as restrictions on employment of foreign personnel, restrictions on imports of capital goods; rules of origin; ceilings on royalties and technical assistance fees etc.

As suggested by the examples above, most of the restrictions are of NTM (non-tariff measure) type and thus in comparison with restrictions on trade flows they are difficult to quantify. FDI restrictiveness indexes are among the most common measures that are used to summarise the overall (relative) restrictiveness of a given sector and/or economy.

In this paper, our starting point for quantifying the impact of barriers to FDI and MNCs is the FDI restrictiveness index developed by OECD (Kalinova et al., 2010). The database provides information on the relative restrictiveness of OECD and other G20 countries decomposed by sector. Individual measures are scored based on their degree of restrictiveness and weighted. The four types of measures covered by OECD's FDI Restrictiveness Index are foreign equity restrictions, screening and prior approval requirements, rules for key personnel and other restrictions.

As shown in Figure 3 the countries with the highest FDI restrictiveness index in distribution services are Tunisia (0.625), Jordan (0.56), Indonesia (0.435) and India (0.394). On the other extreme, there are numerous countries that are shown to have no restrictions on FDI in retail and wholesale among which there are 19 EU countries, United States, Chile, Argentina, Egypt and Morocco.

Figure 3: FDI Restrictiveness Index in Distribution Services



Source: OECD

5.2 Quantifying the effect of FDI restrictions

While the OECD FDI restrictiveness indexes provide a measure of the relative restrictiveness of a sector/country, for the purposes of this paper we need to develop ad-valorem equivalents of these barriers. Ideally, one would need to differentiate between barriers relating to the ongoing operations of multinationals and barriers relating to entry and establishment.

The estimation methodology, data sources and results are discussed in detail in Fukui and Lakatos (2012). The gravity-like econometric specification allows us to quantify on the one hand, the effects of FDI restrictions on the sales of foreign affiliates and on the other hand on foreign direct investment. The estimate of interest in the equation below is $\beta_5 = -0.55$ and $\beta_5 = -1.44$ representing the elasticity of foreign affiliate sales and FDI with respect to the FDI restrictiveness index, respectively. As expected, we find that there is a negative relationship between restrictiveness and foreign affiliates sales and foreign direct investment.

$$FAS/FDI_{ihst} = \beta_0 + \beta_1 Y_{iht} + \beta_2 Y_{st} + \beta_3 Ypc_{ht} + \beta_4 Ypc_{st} + \beta_5 Yrow_{rst} \\ + \beta_6 EFWt_{iht} + \beta_7 FDIr_{iht} + \beta_8 SK_{hst} + \gamma_t$$

- FAS_{ihst} log of foreign affiliate sales or foreign direct investment in sector i, host country h, source country s, at time t
- Y_{iht} log of output of sector i, in host country h, at time t
- Y_{st} log of GDP of source country s at time t
- Ypc_{ht} log of GDP per capita of host country s at time t
- Ypc_{st} log of GDP per capita of source country s at time t
- $Yrow_{rst}$ log of the GDP of the rest of the world
- $FDIr_{iht}$ FDI restrictiveness index (OECD) in sector i, host country h, at time t
- $EFWt_{ht}$ trade openness index of host country h, at time t
- SK_{hst} the ratio of skilled to unskilled workers of host country h relative to that of source country s at time t

Given $\beta_5 = -0.55$ and $\beta_5 = -1.44$, we can further calculate the ad-valorem tax

equivalents of barriers to FDI on foreign affiliate sales and FDI, respectively. Results are reported in detail in Table 4. We find for instance that full liberalisation of barriers to FDI would lead to a 21.67% increase in the sales of foreign affiliates and a 56.91% increase in FDI in India.

Table 4: Tax equivalents of barriers in the distribution sector

	OECD	Authors' estimates	
	Index	% Sales	% FDI
USA	0	0	0
China	0.238	13.09%	34.38%
India	0.394	21.67%	56.91%
East Asia	0.087	4.79%	12.57%
ASEAN	0.158	8.68%	22.82%
AusNz	0.099	5.43%	14.30%
EU27	0.013	0.71%	1.88%
ROW	0.075	4.15%	10.83%

Source: OECD and authors' own calculations

6 Economy wide impacts of the liberalisation of the distribution sector

The distribution sector plays an crucial role in the economy with strong intra- and inter-industry linkages both upstream and downstream. Overall, it accounts for 9% of total world output, 11% of consumer spending and 11% of total sectoral value added (see Table 5). In India, the importance of the distribution sector is even more pronounced than the world average with 10% (\$227 billion) and 14% (\$100 billion) of total output and consumer spending, respectively and 14% of sectoral value added. As such, any policy measure that directly impacts the functioning of the distribution sector will trickle down

to consumers, suppliers upstream and downstream and internationally through trade flows and commercial presence.

Table 5: An overview of distribution sector (USD billion, 2007)

	Output	Share	Exports	Share	Value added	Share	Consumption	Share
USA	2895	12%	17	1.2%	1693	13%	1592	16%
China	450	5%	22	1.8%	219	7%	153	13%
India	227	10%	3	1.1%	161	14%	100	14%
East Asia	1438	12%	77	4.8%	830	15%	725	22%
ASEAN	309	11%	18	2.1%	171	14%	120	18%
AusNz	253	13%	7	3.3%	109	13%	135	27%
EU27	2580	8%	130	2.2%	1118	7%	1780	20%
ROW	2071	10%	38	1.1%	1310	13%	1017	16%
World	10224	9%	311	2%	5610	11%	5622	18%

Source: GTAP v8 database

It is important to note that the distribution sector relies heavily on establishing commercial presence abroad as mode of delivering services to international markets. As a result, it is not surprising to find that the share of exports of distribution services in total trade is not significant (2% world average). The global database on foreign affiliate sales (Fukui and Lakatos, 2012) allows us to further decompose the regional and sectoral distribution of foreign affiliates worldwide. We find that distribution services account for 25% of global foreign affiliate sales (\$5.3 trillion) with 34% in EU27 countries, 31% in the United States. In India, due to prohibitive barriers to entry foreign affiliate sales in distribution are only 6% of total while manufacturing and other services are important destination sectors for foreign affiliates.

Table 6 reports the share of foreign affiliates in each host country for distribution services and all sectors of the economy. As expected, the regional distribution of source countries is quite concentrated in favour of EU27 and US. For instance, we find that in distribution services US and EU27 affiliates capture 99% of the Indian market with 69%

and 30%, respectively. With respect to the economy as a whole, there the concentration of source countries is less pronounced.

Table 6: Foreign affiliates in the world economy (share in total host)

Host/Source	USA	China	India	EAsia	ASEAN	AusNz	EU27	ROW	Total
Distribution services									
USA	0.00	0.00	0.06	37.09	4.58	0.00	28.14	30.13	100
China	40.95	0.00	0.00	0.25	0.04	0.02	58.51	0.22	100
India	68.84	0.02	0.00	0.50	0.17	0.08	29.93	0.46	100
East Asia	31.03	3.58	0.74	9.63	7.80	5.54	28.02	13.67	100
ASEAN	86.40	0.01	0.00	0.97	0.15	0.17	12.14	0.16	100
AusNz	46.79	0.02	0.01	0.56	0.16	0.29	51.81	0.36	100
EU27	17.70	0.19	0.59	10.79	2.70	0.62	53.63	13.78	100
ROW	55.94	0.01	0.00	0.17	0.03	0.06	43.32	0.48	100
All sectors									
USA	0.00	2.09	0.05	26.45	3.22	4.98	36.30	26.91	100
China	27.61	0.00	0.02	15.58	3.37	4.11	39.70	9.63	100
India	33.77	0.03	0.00	20.47	0.19	2.48	42.37	0.70	100
East Asia	29.32	2.69	0.21	11.01	6.12	10.24	23.25	17.17	100
ASEAN	40.64	0.03	0.01	9.11	0.52	3.41	42.24	4.03	100
AusNz	25.01	0.04	0.01	23.85	3.20	0.39	37.09	10.41	100
EU27	26.01	0.35	0.60	5.44	2.09	0.60	49.70	15.22	100
ROW	38.31	0.01	0.02	5.85	0.15	1.82	37.97	15.87	100

Source: Fukui and Lakatos (2012)

Despite the fact that the international delivery of distribution services takes places mainly through Mode 3 of GATS, i.e. establishing commercial presence abroad, barriers as quantified in Table 4 are still significant. In this context, we proceed with examining the impacts of the removal of these barriers in unilateral and multilateral liberalisation scenarios in distribution services in India and worldwide.

6.1 Unilateral liberalisation of distribution services in India

Despite the recent controversy about opening up the distribution sector to foreign retailers, there is political will that remains in favour of pushing through the reforms in India.

The present section describes the impacts of unilateral liberalisation of the distribution sector in following three progressive scenarios:

- scenario 1a (S1a): removal of 75% of existing barriers to foreign commercial presence in the distribution sector in India;
- scenario 1b (S1b): S1a + 3.8% productivity growth in the domestic distribution industry in India;
- scenario 1c (S1c): S1b + 3.8% productivity growth in agriculture in India

In scenarios S1b and S1c we consider additional productivity spillovers in the domestic Indian retailing industry and upstream food supplying sectors in order to provide a more holistic impact assessment of the associated results of liberalisation not explicitly considered in our existing CGE framework. The productivity spillovers considered here are in line with existing research that has shown that FDI and the presence of multinationals are sources of positive productivity spillovers for domestic economies. More specifically, Javorcik and Li (2008) find that the presence of foreign chains in the retail industry in Romania increases total factor productivity (TFP) of food supplying sectors by 3.8-4.7%. In addition, there is evidence that foreign direct investment leads to productivity spillovers in upstream and downstream industries but also increases the productivity of domestic firms in the same sector (Javorcik, 2004).

As a first step, we consider the changes in output in distribution services and agriculture as a result of unilateral liberalisation across different scenarios as shown in Table 7. Note that foreign affiliates of different countries have differentiated responses even if the degree of liberalisation is assumed to be homogeneous for each source country, i.e. we assume that barriers are in line with MFN treatment. The output of domestically owned distribution firms in India decreases by -1.6% while the output of foreign affiliates expand by 65.46%. Other sectors such as agriculture and transport services benefit from

the overall expansion of distribution services. In scenario S1b, as a result of the productivity spillover to domestically owned distribution sector, we find an increase in output of Indian owned distribution services by 0.18% while the output of foreign affiliates increases by slightly less (53.73%) than in the previous scenario. Finally, the productivity increase simulated in scenario S1c in agriculture results not only in the growth in output of this sector but also an additional expansion of the domestically owned distribution sector in India. Also, note that the mining sector in India is the only one that suffers as a result of the liberalization of FDI in distribution services and contracts systematically across all scenarios.

Table 7: Unilateral liberalisation: output in India (% change)

	Domestic output			Foreign affiliates		
	S1a	S1b	S1c	S1a	S1b	S1c
Agriculture	0.12	0.45	2.05	0.13	0.47	1.89
Mining	-0.05	-0.26	-0.40	-0.06	-0.39	-0.79
Manufactures	0.16	0.68	1.48	0.14	0.64	1.41
Distribution	-1.60	0.18	0.81	65.46	53.73	54.82
Transport	0.16	0.58	1.07	0.11	0.46	0.97
Other services	0.12	0.45	0.71	0.10	0.45	0.82

Source: Authors' simulations

We proceed with the analysis of unilateral liberalisation on consumers in India as depicted in Figures 4 and 5. As output in the distribution sector expands, consumers reap the benefits of liberalisation through increased consumption and lower prices. As a result of the reduction of barriers to FDI and activities of MNCs, consumer prices of distribution services fall by -0.89% in India. Furthermore, as we simulate the impact of additional productivity spillovers in the domestically owned distribution sector, consumption in India increases by 2.51% while average consumer prices in the distribution sector fall by -4.61%. Given that the distribution sector has important inter-industry linkages across

the economy, other sectors also benefit from the liberalisation and the spillovers. Finally, in scenario S1c we find that agricultural consumer prices fall by -4.35% and consumption increases by 2.21%.

Liberalisation has an impact on investment in India through the price of capital goods and the rental price of capital. As different foreign affiliates expand their output in scenario S1a, overall foreign direct investment in the distribution sector in India expands by 120.28% and at the same time domestic investment falls by -3.14% as Indian distributors become less competitive.

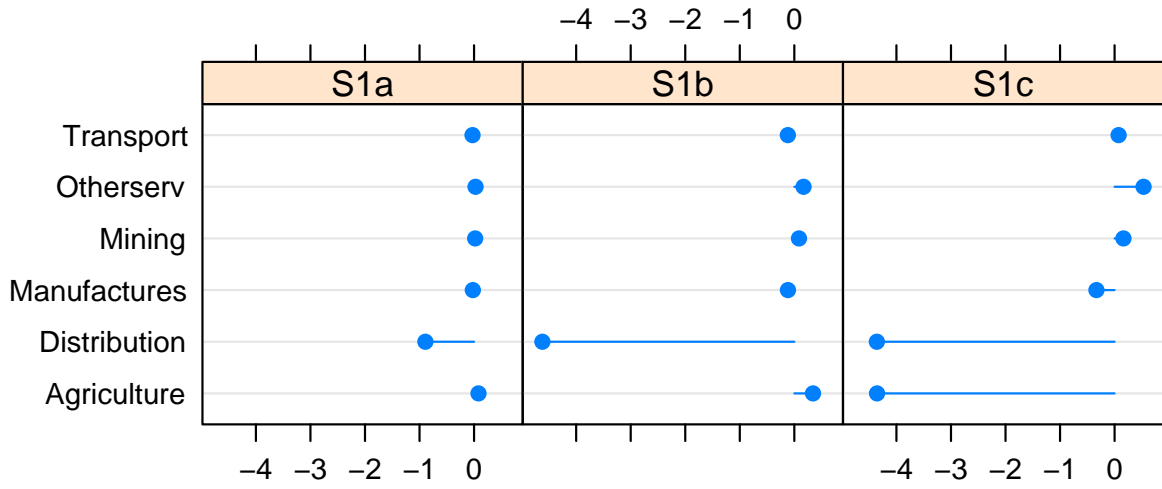
Table 8: Unilateral liberalisation: investment in India (% changes)

	Domestic investment			Foreign investment		
	S1a	S1b	S1c	S1a	S1b	S1c
Agriculture	0.34	1.28	-2.49	0.39	1.40	-3.20
Mining	0.02	-0.03	-0.24	0.01	-0.40	-1.38
Manufactures	0.30	1.39	2.84	0.31	1.45	2.97
Distribution	-3.14	-4.83	-3.67	120.28	89.90	92.56
Transport	0.24	1.11	2.19	0.27	1.24	2.47
Other services	0.24	1.05	1.85	0.20	0.96	1.77

Source: Authors' simulations

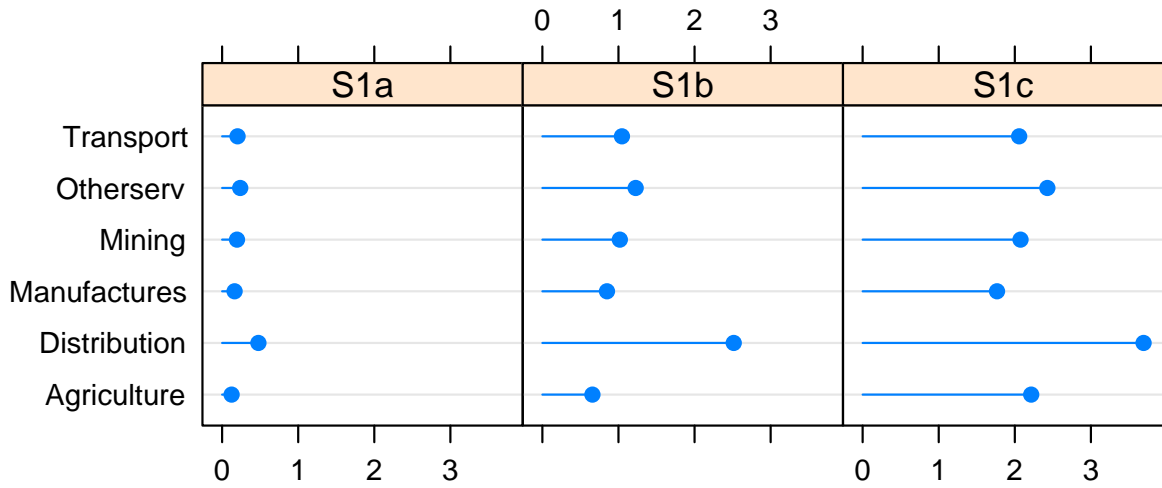
In terms of aggregate impacts on the economy as a whole (see Figure 6) India's GDP is expected to increase by 0.16% in scenario S1a and more significantly by 1.71% in S1c, largely due to the productivity improvements in agriculture and distribution the distribution sector make up approximately 10% and 11.4% of India's economy, respectively. Finally, consumers benefit from a general reduction in the level of consumer prices reinforced by the increase in wages.

Figure 4: Unilateral liberalisation: consumer prices in India (% change)



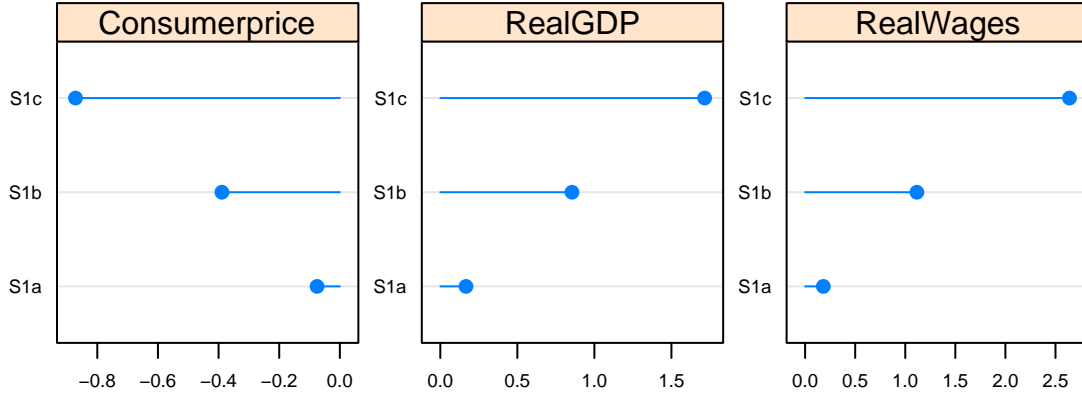
Source: authors' simulations

Figure 5: Unilateral liberalisation: consumption in India (% change)



Source: authors' simulations

Figure 6: Unilateral liberalisation: macro indicators India (% change)



Source: authors' simulations

6.2 Multilateral liberalisation of distribution services

The multilateral liberalisation of services trade, including that of distribution services, is internationally regulated by the General Agreement on Trade in Services (GATS) negotiations that began in 2000. Distribution services attracted a relatively low level of commitments from 68 WTO member countries and there are still some product exclusions and exemptions from MFN (Most Favored Nation) that remain (WTO, 2010). India and other WTO members that still impose significant barriers to distribution services did not take any commitments in this sector.

In this section, we consider the multilateral removal of 75% barriers to distribution services worldwide.

We first consider the impacts of multilateral liberalisation on output by sectors and countries presented in Table 9. The changes in the output of distribution services is as expected: countries with the highest initial barriers gain competitiveness and expand their output the most. Given that in the US barriers to establishing foreign commercial presence in distribution services are assumed to be zero, we find that output of distribution services

slightly declines as both domestic producers and foreign affiliates become less competitive. Furthermore, we note that given the importance of backward and forward linkages of the distribution sector with the rest of the economy, we find that other sectors benefit from an expanding distribution sector.

Table 9: Multilateral liberalisation: output (% changes)

	Agric	Mining	Manuf	Distrib	Transport	Other serv
USA	0.06	0.15	0.01	-0.02	0.01	0.00
China	0.18	0.17	0.15	1.10	0.20	0.22
India	0.13	0.12	0.16	0.32	0.17	0.12
East Asia	0.06	0.24	0.07	0.00	0.08	0.03
ASEAN	0.13	-0.02	0.25	1.11	0.40	0.36
AusNz	-0.02	-0.26	0.00	0.64	0.13	0.26
EU27	0.04	0.16	0.03	-0.02	0.04	0.01
ROW	0.13	0.10	0.15	0.11	0.16	0.17

Source: Authors' simulations

Changes in domestic and foreign investment by host and sector are depicted in Table 10. As expected, the distribution sector attracts foreign direct investment as result of the multilateral liberalisation of the sector while domestic investment in this sector declines. For instance, FDI in India increases the most by 120%, followed by China (71.6%) and ASEAN (36.7%). As FDI flows surge, domestic investment is expected to decline by -3.2% in India, -4.82% in ASEAN and -9.07% in China. Finally, other sectors also benefit from the multilateral liberalisation of distribution services and are expected to attract more FDI.

Table 10: Multilateral liberalisation: investment by host and sector (% changes)

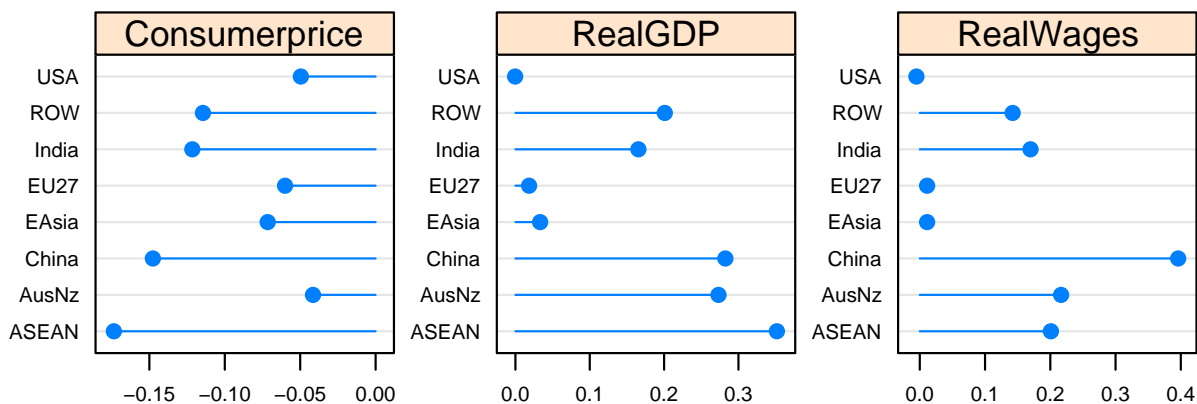
Host/Sector	Agric	Mining	Manuf	Distrib	Transp	OServ
Domestic investment						
USA	0.04	0.20	-0.07	-0.10	-0.07	-0.08
China	0.40	0.39	0.23	-9.07	0.29	0.29
India	0.31	0.31	0.24	-3.25	0.19	0.18
East Asia	0.14	0.47	0.07	-0.53	0.05	0.02
ASEAN	0.71	0.40	0.66	-4.82	0.83	0.76
AusNz	0.80	0.36	0.57	-2.96	0.63	0.87
EU27	0.03	0.25	-0.03	-0.56	-0.02	-0.05
ROW	0.34	0.28	0.25	-3.09	0.21	0.23
Foreign direct investment						
USA	0.06	0.35	-0.07	-0.10	-0.07	-0.08
China	0.38	0.76	0.21	71.60	0.25	0.31
India	0.37	0.50	0.32	120.08	0.21	0.14
East Asia	0.19	0.61	0.10	23.37	0.11	0.03
ASEAN	0.86	1.45	0.71	36.79	0.48	0.77
AusNz	0.97	0.75	0.57	24.62	0.67	0.86
EU27	0.01	0.49	-0.05	2.90	-0.02	-0.04
ROW	0.31	0.57	0.19	18.60	0.17	0.25

Source: Authors' simulations

We conclude our analysis with examining the impacts of the multilateral liberalisation of the distribution sector on macroeconomic aggregates (see Figure 7). All countries experience a real GDP growth, however the magnitude of changes is small. These small impacts are expected given that foreign ownership in the distribution sector is still relatively small across the liberalising countries ranging from 30% in ASEAN countries, 13% in China to 10% in EU27 and US and 8% in East Asian countries. Thus, we find that

as a result of multilateral liberalisation real GDP increases most in ASEAN (0.35%), China (0.28%) and Australia and New Zealand (0.27%). Consumers reap the benefits of multilateral liberalisation as the consumer price index falls in all regions while real wages increase slightly. India also benefits from multilateral liberalisation with an 0.16% increase in real GDP and an overall fall of 0.12% in consumer prices.

Figure 7: Multilateral liberalisation: macro indicators (% change)



Source: Authors' simulations

7 Conclusions

Delivering services to international markets through Mode 3 under GATS, i.e. establishing commercial presence abroad is still subject to significant barriers in general and in distribution services in particular. This paper is aimed to highlight the features of a new CGE model that considers explicitly not only FDI but also the foreign affiliates differentiated by the region of location and ownership and thus is a significant improvement on existing tools for quantifying the removal of barriers to services trade. To illustrate the model's behaviour, we examine the unilateral and multilateral removal of barriers to foreign commercial presence in the distribution sector in the light of the recent policy debate in India.

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