

## RICE IMPORTS, PRICES, AND CHALLENGES FOR TRADE POLICY

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As discussed in Chapter 2, demand for rice in Nigeria has outpaced domestic production due to rapid population growth, increasing incomes, urbanization (and lifestyle changes that accompany urbanization), and a decline in the relative price of rice. At the same time, Chapters 4 and 6 also showed how domestic production has been only relatively modest because of problems with input supply (superior-quality seed and fertilizer), inadequate extension services, poor quality of postharvest processing and milling technologies, and inadequate (and highly variable) price incentives for farmers. This widening gap between demand and domestic production has been met by rice imports, which have increased from 590,000 tons per year in the 1970s to an average of 2.42 million tons from 2010 to 2012—a fourfold increase (USDA 2013).<sup>1</sup> In this chapter, we focus our attention on the trade aspect of Nigeria’s rice economy.

In an effort to limit the volume of imports and to provide protection to domestic rice producers to spur production, the Nigerian government has placed substantial import tariffs on rice, although these tariffs have varied widely over time. For example, the import tariff on rice was increased from 50 percent in 2012 to 110 percent in January 2013. These tariffs are likely to be passed on to the consumer in the form of higher market prices. In addition to higher tariffs that may affect the domestic price of imported rice, there have been large fluctuations in nominal and real exchange rates that have also had substantial influence on incentives for imports as well as the domestic price of imported rice. Further complicating the price incentive picture of Nigeria’s rice imports is substantial tariff evasion through underpayments for official imports through Lagos and other ports, as well as smuggling across Nigeria’s borders with Benin and Niger (for the location of Lagos, see Figure 1.1 in Chapter 1).

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1 In this chapter, all tons are metric tons.

The objective of this chapter is to analyze Nigeria's recent rice import policies in terms of their effectiveness and tradeoffs with regard to affecting the volume of imports, domestic prices, and tariff revenues in the country. More specifically, we present an analysis of Nigeria's international rice trade, covering international market price and quantity evidence, Nigeria's trade (and exchange-rate) policy, and the effectiveness of tariffs in influencing rice imports and domestic prices of imported and local rice. We begin by presenting various estimates of the volume of rice imports, including estimates derived from data on rice-exporting countries, which show that official figures for imports have substantially understated actual imports. Next, we discuss the price incentives for imports, as determined by exchange-rate and rice trade policy (import tariffs and periodic import bans). Price distortions created by these policies are summarized in calculations of nominal rates of protection. We also analyze the relationship between the estimated import parity price and domestic prices of imported rice and local rice. The chapter concludes by providing a brief summary of findings.

## **Alternate Estimates of Rice Imports**

There is substantial uncertainty about the volume of Nigeria's rice imports in recent years. Table 7.1 presents summary data on recent rice imports from various sources. The large percentage of Nigeria's rice imports not recorded in the country's customs data suggests widespread tariff evasion. Nigeria's customs data indicate that an average of 342,000 tons of milled rice (384,000 tons of rice of all types) were imported each year (column 1 of Table 7.1) from 2009 to 2011. For that same time period, the United Nations Commodity Trade Statistics Database (COMTRADE) data show that Nigeria reported an average of 517,000 tons (column 2 of table 7.1) of imported rice per year.<sup>2</sup> However, COMTRADE data from exporting countries, shown in column 3, indicate that total exports of rice to Nigeria averaged 1.9 million tons per year. United States Department of Agriculture (USDA) estimates of Nigeria's rice imports in this period are quite similar: 2.1 million tons per year (column 4 of table 7.1). Thus, both COMTRADE and USDA data suggest that on average, only about one-quarter of Nigeria's rice imports were recorded by customs in the 2009–2011 period (Table 7.1 and Figure 7.1).

According to the COMTRADE data, in most years the bulk of Nigeria's imports originate from India and Thailand, though there have also been

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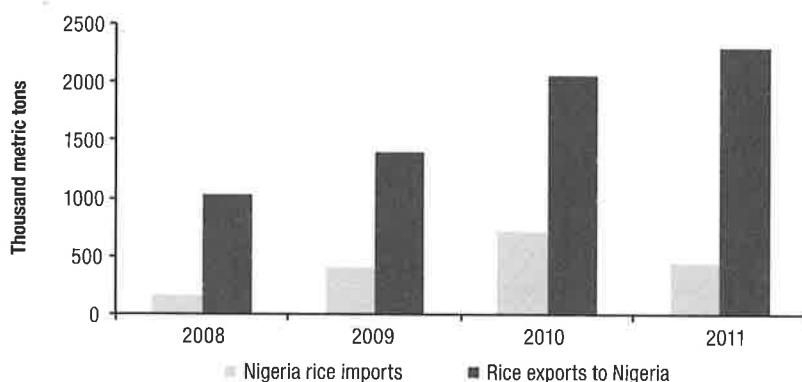
2 COMTRADE data for Nigerian imports are based on statistics reported by Nigeria. Thus, there is an inconsistency between these two Nigerian data sources.

**TABLE 7.1** Rice imports by Nigeria and world rice exports to Nigeria, 2008–2012

	(1) Official imports (thousand tons)	(2) COMTRADE Nigeria imports (thousand tons)	(3) COMTRADE Exports to Nigeria (thousand tons)	(4) USDA Nigeria imports (thousand tons)	(5) Official imports vs. COMTRADE exports (percent)
2008	318	160	1,021	1,800	31.1
2009	330	398	1,397	2,000	23.6
2010	551	711	2,053	2,000	26.8
2011	270	441	2,299	2,300	11.7
2012	230	—	—	2,200	—
Average 2009–2011	384	517	1,916	2,100	20.0
Jan–Aug 2012	169	—	—	—	—
Sept–Dec 2012	61	—	—	—	—

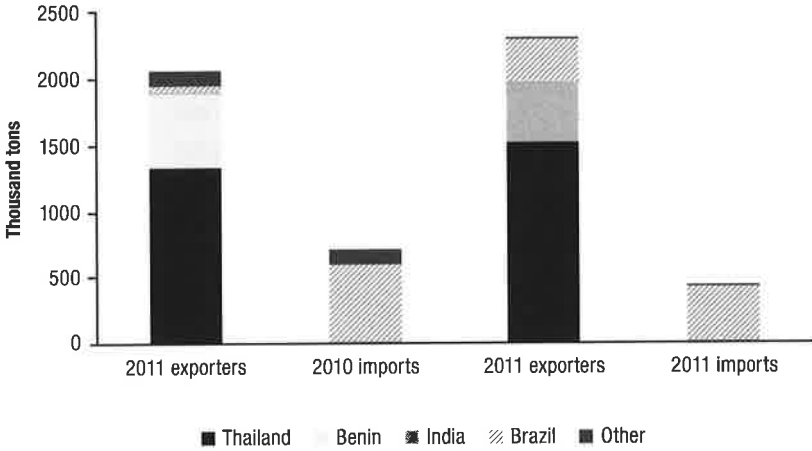
**Source:** UN Statistics Division (2012), National Bureau of Statistics (NBS), and USDA Data.

**Note:** COMTRADE = United Nations Commodity Trade Statistics Database. USDA = United States Department of Agriculture.

**FIGURE 7.1** Rice imports by Nigeria and world rice exports to Nigeria, 2008–2012

**Source:** United Nations Commodity Trade Statistics Database.

sizable imports from Brazil in recent years (Figure 7.2). In addition, rice smuggled from Benin or Niger into Nigeria may not be included in the COMTRADE data in all years. COMTRADE data on Benin's rice exports to Nigeria vary sharply from year to year but are relatively small in most years compared to total rice exports to Nigeria. For example, COMTRADE data for 2009 show 140,000 tons of rice exported by Benin to Nigeria (10.1 percent of COMTRADE figures for total exports to Nigeria), 552,000 tons in 2010

**FIGURE 7.2** Rice imports by Nigeria and world rice exports to Nigeria by country, 2010 and 2011

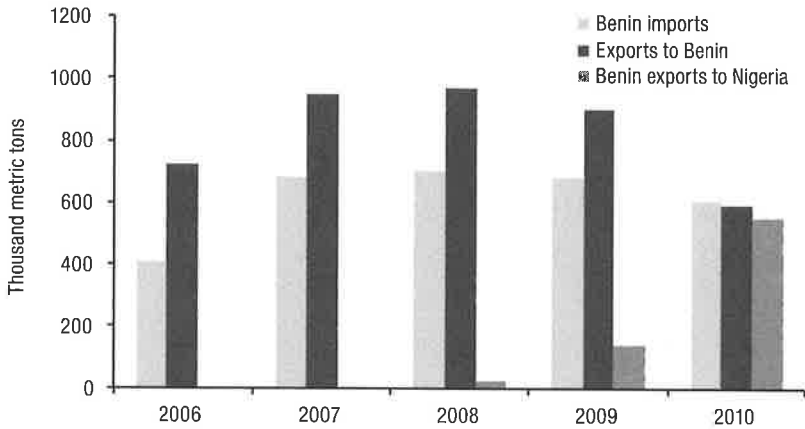
Source: United Nations Commodity Trade Statistics Database.

(26.9 percent of total exports to Nigeria), and zero in 2011 (Figures 7.2 and 7.3). Assuming about 150,000 tons of rice were smuggled from Benin to Nigeria in 2011 as well, the cross-border trade with Benin averaged about 300,000 tons per year, or about 15 percent of Nigeria's total rice imports.<sup>3</sup> Thus, the evidence suggests that over the period from 2009 to 2011, the bulk of rice from Benin that passed through Nigeria's ports was unrecorded.

## Trends in Rice Imports

There are two major international sources for time-series data on Nigeria's rice imports: USDA and the Food and Agriculture Organization of the United Nations (FAO). In principle, these sources take into account available data on rice imports from Nigerian government sources but make major adjustments for unrecorded rice imports. Both data series show that Nigeria's rice imports have increased rapidly over the past two decades. USDA data indicate that average annual imports of milled rice have almost tripled in the past two decades, rising from 590,000 tons in the 1990s to 1.68 million tons per year in the first five years of the 2000s (Table 7.2, column 1). FAO estimates

3 Local sources report that around 8,000 bags of rice are smuggled into Nigeria every day through waterways between Nigeria and Benin. Assuming a weight of 50 kilograms per bag, the annual amount smuggled into the country would be 146,000 tons.

**FIGURE 7.3** Benin's total rice trade and rice exports to Nigeria, 2006–2011

Source: United Nations Commodity Trade Statistics Database.

suggest that annual average imports doubled over the same period, increasing from 432,000 tons in the 1990s to 1.36 million tons in the first five years of the 2000s (Table 7.2, column 1). Both sources show rice imports that are substantially larger than the data from official Nigerian sources. Both sources also show a consistent increase in rice imports over time.

The growth rate in rice imports was especially high in the 1990s: an annual average rate of about 17 percent using USDA data (over 13 percent according to FAO estimates). Data from the two sources begin to diverge significantly around 2005, while maintaining a broadly consistent direction of movement (Figure 7.4). Both USDA and FAO data show that rice imports grew rapidly during the 2005–2012 period, although slower than they did during the 1990–1999 period (Table 7.2). Average annual production of milled rice rose gradually during these periods from 1.8 million tons per year in the 1990s to 2.7 million tons per year in the 2010s, growing at a much slower rate than imports. As a result, the share of imports in domestic availability of rice has risen sharply from 26.5 percent in the 1990s to almost 50 percent in the first decade of the 2000s (FAO data show the share of imports in availability rose from about 19 percent in the 1990s to about 43 percent in the 2010s).<sup>4</sup> Note that although imports account for a large

<sup>4</sup> Domestic availability of rice is calculated as availability = milled production less 10 percent losses plus imports.

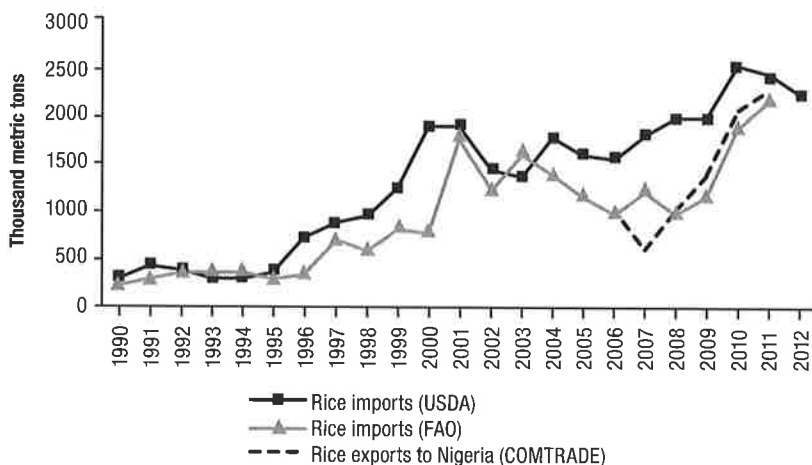
**TABLE 7.2** Nigeria's average annual rice imports, production, and domestic availability, 1960–2012

	(1) Rice imports (thousand tons)	(2) Rice production (thousand tons)	(3) Rice domestic availability (thousand tons)	(4) Rice imports vs. rice domestic availability (percent)
<i>USDA estimates</i>				
1960–1969	1.00	222.00	201.00	0.5
1970–1979	199.00	357.00	520.00	38.3
1980–1989	529.00	866.00	1,308.00	40.4
1990–1999	590.00	1,818.00	2,226.00	26.5
2000–2004	1,679.00	1,851.00	3,346.00	50.2
2005–2009	1,790.00	2,131.00	3,653.00	49.0
2010–2012	2,417.00	2,725.00	4,869.00	49.6
Growth rates (1990–1999)	16.69	1.76	5.59	
Growth rates (2000–2004)	1.43	–0.06	0.49	
Growth rates (2005–2012)	5.70	4.23	4.90	
<i>FAO estimates</i>				
1960–1969	1.00	138.00	139.00	0.8
1970–1979	161.00	275.00	436.00	36.9
1980–1989	413.00	971.00	1,384.00	29.8
1990–1999	432.00	1,821.00	2,253.00	19.2
2000–2004	1,358.00	1,852.00	3,210.00	42.3
2005–2009	1,099.00	2,038.00	3,266.00	33.7
2010–2012	2,035.00	2,713.00	4,748.00	42.9
Growth rates (1990–1999)	12.71	1.71	3.79	
Growth rates (2000–2004)	13.67	–0.07	4.53	
Growth rates (2005–2012)	7.15	3.90	5.14	

**Source:** USDA and FAO data.

**Note:** All quantities are milled rice. Growth rates are based on logarithmic regression coefficients. USDA = United States Department of Agriculture. FAO = Food and Agriculture Organization of the United Nations. Due to rounding, figures in column 4 may slightly differ from the quotients of dividing figures in columns 1 and 3.

share of rice supply, these figures suggest they account for a relatively small share of calories (213 kcal/capita/day or 8 percent of daily per capita calorie intake in 2009 [FAO 2012]) and value of imports (2.4 percent). At a world price of \$400/ton C&F (cost and freight) Lagos (rounded to the nearest hundred), 2.0 million tons of rice would cost 0.8 billion dollars, 2.4 percent of total imports in 2009 (IMF 2012; USDA 2014).

**FIGURE 7.4** Rice imports by source of data

**Source:** USDA (2012); FAO (2012); UN Statistics Division (2012).

**Note:** COMTRADE = United Nations Commodity Trade Statistics Database. FAO = Food and Agriculture Organization of the United Nations. USDA = United States Department of Agriculture.

## Exchange Rates and Milled Rice Import Tariffs

Although import tariffs have been the main policy instrument influencing the price of imported rice in Nigeria, changes in exchange rates, the extent of foreign-exchange rationing, and the world price of rice are also important components in the cost of imported rice (the import parity price). Fluctuations in all of these components have contributed to substantial volatility in import parity and domestic rice prices in Nigeria. In this section, we briefly review exchange-rate and rice tariff policies and discuss the impact of the import tariff and exchange-rate policies on the domestic price of imported rice.

### Exchange-Rate Policy

Exchange-rate policy in Nigeria has been heavily influenced by developments in the petroleum sector. In the 1950s and 1960s, the agriculture sector was the principal foreign-exchange earner, with 3–4 percent annual average output growth rates for export and food crops. During this period, macroeconomic policies were formulated on the principle of taxation (explicit and implicit) of the agricultural sector to fund investments in other sectors of the economy (manufacturing, infrastructure development, education, etc.). With the emergence of oil as a major factor in Nigeria's economy in the 1970s, the need for explicit taxation of agriculture to fund government expenditures lessened, as

did indirect tax rates. However, real exchange-rate appreciation resulting from increased oil exports led to substantial indirect taxation of agriculture.

The increase in foreign currency earnings stemming from increased oil exports led to a sharp appreciation of the domestic currency (naira) in real terms. As massive oil export revenues were spent in the domestic economy in the 1970s and 1980s, nominal wages and the domestic prices of non-tradeable goods and services rose sharply, while prices of tradeable goods such as cocoa, palm oil, rice, and many manufactured goods that were largely determined by the world price—converted to naira at the official nominal exchange rate—generally remained stable or rose only slowly, resulting in a decline in their prices relative to prices of non-tradeables. As a result, growth in the non-oil tradeable goods sector suffered, a phenomenon known as the Dutch Disease (named for the stagnation of the industrial sector in the Netherlands following a rapid increase in natural gas export revenues in the 1970s). While some governments attempted to mitigate the impact of Dutch Disease using exchange-rate protection (adopting policies to prevent the tradeable/non-tradeable price ratio from continuing to decline as the oil boom proceeded), the Nigerian Central Bank adopted a policy of gradual nominal appreciation of the naira against the US dollar and British pound in the 1970s in order to maintain naira exchange rates that reflected the country's balance-of-payments position.<sup>5</sup>

Table 7.3 presents the evolution of Nigeria's real exchange rate (RER), a measure of the relative price of tradeables to non-tradeables, here calculated as the nominal exchange rate multiplied by an index of the price of tradeables (the US wholesale price index) and divided by a measure of the price of non-tradeables in Nigeria.<sup>6</sup> During the 1970s and early 1980s, the real exchange rate appreciated by more than 64 percent (from 94.8 in 1970 to an average of 36.3 in 1985) as the nominal exchange rate (naira/US dollar) depreciated by only 25 percent from 1970 to 1985 (0.71 to 0.89 naira/US dollar), while domestic inflation (which raised prices more than 800 percent) greatly outpaced inflation in international (US dollar) prices (which rose by 180 percent).

Moreover, following the collapse of global oil prices in 1982 and the rise in real interest rates on international markets, Nigeria experienced increasingly severe foreign-exchange shortages. As its foreign-exchange reserves dwindled,

5 Throughout this period, Nigeria maintained an adjustable peg exchange-rate policy in the official market.

6 More generally, the real exchange rate is defined as  $RER = ER \cdot PT / PNT$ , where ER is the nominal exchange rate measured in units of local currency per international currency, PT is the world price of tradeables in a common international currency (typically an index such as the weighted average of producer prices index of trading partners), and PNT is a measure of domestic prices of non-tradeables, such as the domestic consumer price index.

**TABLE 7.3** Average annual nominal and real exchange rates for Nigeria, 1980–2010

	Nominal exchange rate (naira/\$)	Parallel nominal exchange rate (naira/\$)	Parallel nominal exchange-rate premium (percent)	US WPI (2010 = 100)	Nigeria CPI (2010 = 100)	Nigeria inflation (percent)	Real exchange rate (2010 = 100)	Parallel real exchange rate (2010 = 100)
1970–1974	0.7	1.0	52	23.1	0.1	9	85.4	130.4
1975–1979	0.6	1.0	67	36.1	0.3	21	55.0	91.0
1980–1986	0.9	2.8	217	53.8	0.7	16	43.0	131.0
1987–1992	8.5	11.3	35	60.6	2.3	27	142.1	189.8
1993–1998	21.9	74.5	240	67.1	17.5	39	71.9	219.0
1999–2006	118.5	123.7	5	76.5	45.1	13	139.2	146.5
2007–2008	122.2	122.2	0	98.0	74.7	8	106.7	106.7
2009–2011	151.0	151.0	0	100.8	99.6	12	102.0	102.0
2012	157.5	157.5	0	109.4	124.4	12	92.2	92.2
2013	157.3	157.3	0	110.1	134.9	8	85.4	85.4

**Source:** International Monetary Fund International Financial Statistics and authors' calculations.

**Note:** US WPI = US wholesale price index; CPI = consumer price index.

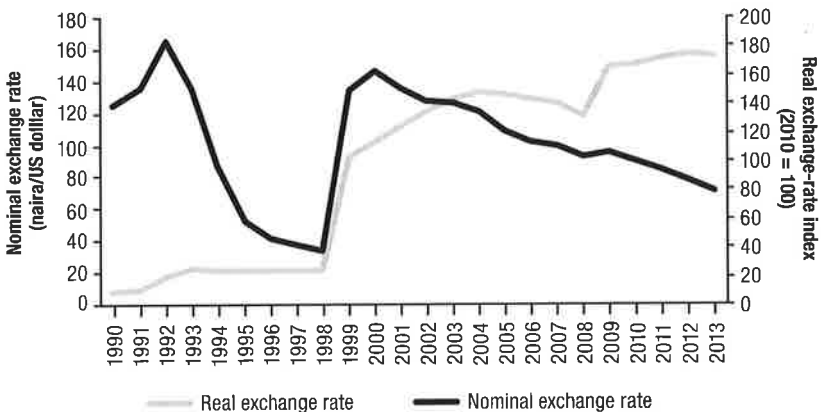
the Nigerian government resorted to rationing foreign exchange in the official market by implementing an import licensing system. As a result of these restrictions, a parallel foreign-exchange market emerged, with substantial premiums: they rose from an average of 67 percent from 1975 through 1979 to more than 200 percent from 1980 through 1986.

Macroeconomic reform—including introduction of a Second-Tier Foreign Exchange Market in 1986 to bring the official exchange rate close to the parallel market rate and a gradual depreciation of the nominal exchange rate thereafter—brought about a substantial depreciation of the real exchange rate and greatly reduced the spread between the official and parallel real exchange rates from 1987 through 1992. During this period, the real exchange rate was on average 142.1 (2010 = 100), 50 percent above its 1970 level (Table 7.3).

Unfortunately, this period of favorable incentives for tradeable goods production did not last. The official exchange rate was kept essentially fixed at about 22 naira/US dollar from 1993 through 1998, a period when domestic prices rose by nearly 320 percent, as domestic inflation accelerated to an average of 39 percent per year. Given only moderate increases in international dollar prices, the real exchange rate appreciated again and averaged only 71.9 for the period.

Macroeconomic stability was largely restored in 1998, and the naira was again allowed to depreciate substantially. Foreign-exchange rationing was greatly reduced, as evidenced by a sharp fall in the parallel market premium to only 5 percent. Over the period 1999 through 2006, the real exchange rate

**FIGURE 7.5** Nigeria's nominal and real exchange rates, 1990–2013



Source: Real exchange rates are authors' calculations based on IMF data; nominal exchange rates are based on monthly IMF exchange-rate data.

Note: IMF = International Monetary Fund.

averaged 139.2, essentially the same as from 1987 through 1992. After 2006, however, the real exchange rate gradually appreciated to 91.8 in 2012 (a total appreciation of 19 percent between 2006 and 2012), although in the absence of rationing, there was not a major parallel market for foreign exchange. This real exchange-rate appreciation implies a substantial reduction in real import prices (a major disincentive for domestic rice production).

Thus, inconsistent macroeconomic policy in Nigeria has led to very large swings in real exchange rates (and in the incentives for production of tradeable goods) since the surge in oil export revenues of the early 1970s. For rice and other “exportable” agricultural commodities (like palm oil and groundnuts), the appreciation of the domestic currency and the resultant shift in terms of trade meant that it was cheaper to import these products than to produce them at home. However, to some extent, rice trade policy (in the form of import tariffs) has served to partially offset the effects of real exchange-rate appreciation in recent years, as described below.<sup>7</sup>

### Rice Import Tariffs

In the absence of foreign-exchange rationing, the cost of imports (the import parity price,  $P_m$ ) is determined as the world price (cost and freight [C&F], Lagos) measured in foreign currency times the exchange rate, plus tariffs, transport, and marketing costs to the domestic market. In mathematical terms,

$$P_m = EP_w(1 + \tau) + \text{mktg}, \quad (1)$$

where  $P_m$  is the import parity price in naira,  $P_w$  is the world price (C&F, Lagos) in foreign currency units,  $E$  is the exchange rate (naira/foreign currency),  $\tau$  is the ad valorem tariff rate, and mktg is total transport and marketing costs.

In many years, effective rationing of foreign exchange through restrictions on foreign-exchange availability (for imports or for foreign-exchange transfers) resulted in a significant spread between the official and parallel market exchange rates. For rice imported with foreign exchange acquired through the parallel market, the relevant import parity price is

$$P_m = E^*P_w(1 + \tau) + \text{mktg}, \quad (2)$$

where  $E^*$  is the parallel market exchange rate (naira/foreign currency) and all other variables are as defined earlier. However, for rice smuggled into Nigeria, either through under-invoicing of imports or evasion of customs procedures,

7 For further discussion of Nigeria's macroeconomic policies, see Sackey et al. (2012).

no import tariffs are paid, and if the foreign exchange for these imports is obtained at the parallel market rate, the relevant import parity price is

$$P_m^* = E^*P_w + \text{mktg}^*, \quad (3)$$

with the cost of smuggling included in the marketing cost ( $\text{mktg}^*$ ). On the other hand, if the smuggled rice is purchased with foreign exchange obtained through official sources, then the import parity price is given as

$$P_m = EP_w + \text{mktg}^*. \quad (4)$$

In the analysis that follows, we include measures of import parity at the official exchange rate with imports ( $P_m$  from equation 1) and import parity at the parallel exchange with no tariffs ( $P_m^*$  from equation 3).<sup>8</sup>

Up until the early 1990s, Nigeria kept its import tariff on milled rice relatively low: 20 percent. Incentives for rice imports nonetheless varied according to the changes in the real exchange rate discussed above, as well as the changes in the world price of rice. Rice tariffs became a major policy instrument starting in 1993, when they were increased to reduce the level of imports, which had been encouraged by the appreciation of the real exchange rate.

As shown in Table 7.4, at official exchange rates, the C&F price of rice in real terms (i.e., adjusted for domestic inflation) averaged 53.5 naira per kilogram (n/kg) from 1993 through 1998, less than half its average level from 1987 through 1992 (111.7 n/kg). Even though the average import tariff in the 1993–1998 period was higher than the average of the 1987–1992 period (60 percent and 20 percent, respectively), the average import price (including tariffs) was still lower in the 1993–1998 period (77.9 n/kg) than the previous period (134.1 n/kg), implying substantially greater incentives for imports in the official market. Since 1998, in spite of relatively high tariffs, rice prices at the wholesale level have remained stable relative to the prices in 1993–1998 and even somewhat lower than prices in the 1987 through 1992 period, in part because of widespread smuggling.

An analysis of changes in rice tariffs and the levels of premiums in the foreign-exchange market (which reflected the extent of foreign-exchange rationing in the official exchange market) shows that the incentives for and levels of smuggling have varied substantially over time. In the first half of the 1980s, the level of domestic prices relative to import prices in the official and parallel markets suggests that domestic prices were determined largely by the

8 Note that in any given market, the source of rice imports may vary over time, so that the prevailing market price (the minimum of  $P_m^*$  and  $P_m$ ) may fluctuate. The *average* market price of imported rice over time thus may be between  $P_m^*$  and  $P_m$ .

**TABLE 7.4** Import prices, import tariffs, exchange-rate premiums, and wholesale prices of rice, 1980–2013

	Import price official ER (2010) n/kg	Import tariff (percent)	Import price official ER w/ tariff (2010) n/kg	Parallel exchange- rate premium (percent)	Import price parallel ER (2010) n/kg	Wholesale market price (2010) n/kg
1970–1974	131.5	20	157.8	52	176.7	246.6
1975–1979	74.6	20	89.5	67	110.0	158.9
1980–1986	44.0	20	52.8	217	100.1	145.3
1987–1992	111.7	20	134.1	35	140.3	198.3
1993–1998	53.5	60	77.9	240	137.2	118.9
1999–2006	69.5	97	136.9	5	73.7	120.0
2007–2008	69.8	72	116.3	0	74.9	126.8
2009–2011	66.1	60	105.6	0	71.4	125.0
2012	73.9	72	127.2	0	79.2	110.8
2013	65.7	110	131.5	0	71.0	110.8

**Source:** Oyejide (1986a, 1986b) for 1970–1976; Robertson (1983) for 1977–1981; Federal Office of Statistics data for 1982–2000 (Walkenhost 2009); Nigeria, NBS (2013b).

**Note:** Import price is calculated as 5 percent of the Thai broken rice price (with the broken rice price taken from Anderson [2009] data files) plus freight costs—which are estimated as 17.8 percent of the Thai broken rice price—multiplied by the appropriate exchange rates. The wholesale price for 1970–1976 is a spliced series constructed by Oyejide (1986a, 1986b); the wholesale price for 1977–1981 is from Robertson (1983) and the 1982–2000 wholesale price is from the Federal Office of Statistics, reported by Walkenhost (2009); the 2001–2013 wholesale price is the retail price of imported rice in Enugu (Nigeria, NBS 2013b) divided by 1.5 (the estimated markup from wholesale to retail). Enugu is a city in the South East zone. ER = exchange rate, n/kg = naira per kilogram.

cost of obtaining foreign currency on the parallel market to import rice. From 1980 to 1986, Nigeria kept rice import tariffs fixed at a relatively low level of 20 percent. Wholesale market prices averaged three times the cost of imported rice at Lagos port (145.3 n/kg versus 44.0 n/kg), suggesting that most imported rice was sold at prices reflecting the parallel market exchange rate that was on average 217 percent above the official exchange rate (Table 7.4).<sup>9</sup>

Import tariffs remained at 20 percent during the 1987 to 1992 period of relatively small premiums in the parallel exchange-rate market that followed the partial liberalization of the foreign-exchange market in late 1986. Import prices at the parallel exchange rate were generally close to the official market import price (including the tariff), suggesting relatively little incentive, on average, for smuggling.

<sup>9</sup> Average import prices in the parallel market are determined by the world rice price, as well as the official exchange rate and the parallel market premium. Parallel market premiums were especially high in 1983, 1984, and 1985 (456, 341, and 324 percent, respectively), but since these were years of relatively low international rice prices (as compared to 1980 and 1981), the average import price at the parallel exchange rate largely reflects the lower premiums of the early years.

The period from 1993 through 1998, like the early 1980s, was again characterized by high domestic inflation, limited depreciation of the nominal exchange rate, and foreign-exchange rationing. In an effort to stem the flow of rice imports, the government gradually raised import tariffs. They reached 100 percent in 1996 and averaged 60 percent for the period as a whole. Given that the average premium in the parallel market (240 percent) far exceeded the average import tariff and that average wholesale prices were less than the cost of imports at the parallel exchange rate, the data suggest that most rice imports in this period likely came through official channels. But customs data on monthly tariff payments provide evidence of substantial evasion of import tariffs. While the custom data on the rate of tariffs paid on rice imports are broadly consistent with official tariff schedules (although data by month vary sharply), the total quantity of rice imports in the customs data is much lower than the COMTRADE data based on exports of rice to Nigeria. For example, the implicit ad valorem tariff rate for milled rice (Table 7.5, column 2), calculated as monthly data of import tariffs collected divided by declared customs values, was 60 percent from 2009 to 2011. Using COMTRADE data on quantity of rice exports to Nigeria (which indicate that on average only about 19 percent of imports were recorded from 2009 through 2011) and the average reported price in the NBS customs data for recorded imports, dividing estimated tariff revenues by the value of total imports results in a rate of only 12 percent (Table 7.5, column 4). Likewise, from January to August 2012, NBS customs data show that import tariff revenues divided by the official cost and freight import value (C&F Lagos [\$/ton]) equaled 58 percent and subsequently rose to 100 percent for September to December 2012. If only about 20 percent of rice imports paid the tariff, however, the average effective tariff rate would have ranged from 12 to 20 percent.

Figure 7.6 shows trends in import parity price with and without tariffs, as well as the domestic market price of imported rice at Enugu, the regional market with the most complete price series in Nigeria. Enugu is a city in the South East zone (see Figure 1.1 in Chapter 1). Generally, the market price of imported rice moves in the same direction as import parity price including the tariff, although the former follows the latter with a lag. Second, beginning in 2008, the domestic price of imports seems to deviate from import parity price including the tariff, and this deviation has increased; this is likely to be partly because tariffs and other trade restrictions have increased since 2000. The figure suggests that some of the increased tariffs are passed to consumers in the form of higher domestic price of imported rice, but the pass-through rate is only partial and seems to be decreasing in recent years, probably due

**TABLE 7.5** Nigeria's rice imports, tariffs, and market prices, 2008–2013

	(1) C&F Lagos (\$/ton)	(2) Implicit ad valorem tariff rate (percent)	(3) Official/total imports (percent)	(4) Average effective tariff rate on total rice imports (%)	(5) Pm Enugu (n/kg)	(6) Imported price Pm (w/ tariff) Enugu (n/kg)	(7) P_Enugu-urban imported (n/kg)	(8) Nominal Rate of Protection (7)/(5)–1 (%)	(9) Percent difference between Pdom and Pm (w/tariff) (7)/(6)–1 (%)
2008	550.2	44	18	8	112.9	156.6	161.6	43	3
2009	373.4	64	17	11	100.5	183.8	194.7	94	6
2010	430.0	64	28	18	116.4	126.1	179.4	54	42
2011	508.2	52	12	6	138.9	182.0	179.1	29	–2
2012	583.9	72	10	8	162.1	261.6	206.7	28	–21
2013	577.5	110	—	—	162.1	298.4	—	—	—
Av. 2009–2011	437.2	60	19	12	118.6	164.0	184.4	55	12
Jan–Aug 2012	581.8	58	—	—	161.3	241.2	204.3	27	–15
Sept–Dec 2012	588.1	100	—	—	163.6	302.4	211.5	29	–30

**Source:** Authors' calculations based on Nigeria, NBS (2013b) and UN Statistics Division (2012).

**Notes:** NBS = National Bureau of Statistics; Pdom = NBS retail price of imported rice in Enugu. The figures indicate a very low rate of official tariff collection; however, the high prices in retail markets suggest substantial rents (possibly including unofficial payments). Annual averages are calculated based on monthly data, so figures in column 8 will differ slightly from those calculated using the figures in columns 5 and 7.

(1) C&F Lagos is calculated as 5 percent Thai broken rice plus \$44.28/ton freight costs (from Anderson [2009] data files).

(2) The implicit ad valorem tariff is based on monthly data of import tariffs collected divided by declared customs values (2008–2011) and on official tariff rates (2012–2013).

(4) The average effective tariff is the estimated total revenues (implicit ad valorem tariff  $\times$  official imports)/total (United States Department of Agriculture est.) from rice imports. USDA estimates of rice imports are not substantially different from United Nations Commodity Trade Statistics Database data for this period.

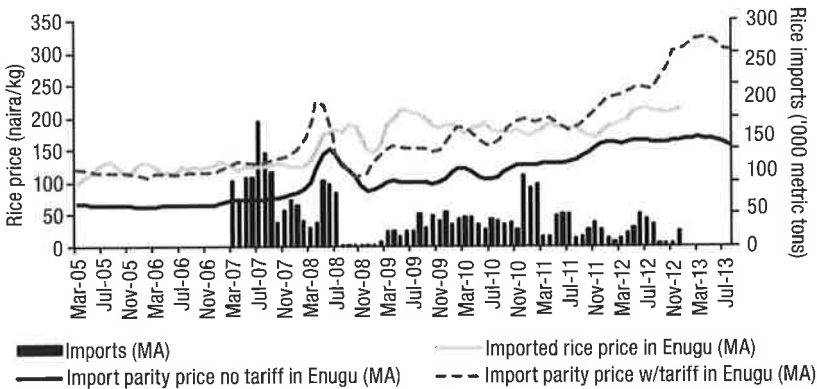
(5) Pm Enugu is calculated as [C&F Lagos + port handling charges and transport and marketing costs to Enugu]  $\times$  (1 + 50% retail margin).

(6) Imported price Pm (w/tariff) Enugu is calculated as [C&F Lagos + tariff (column 2) + port handling charges and transport and marketing costs to Enugu]  $\times$  (1 + 50% retail margin).

(7) P\_Enugu-urban imported is the NBS retail price of imported rice in Enugu, also known as "Pdom."

(8) The Nominal Rate of Protection for rice is calculated as annual averages of monthly values of [P\_Enugu-urban imported (Pdom) in column 7 / P<sub>m</sub> Enugu in column 5] – 1. Therefore, figures may be different from those calculated using figures in columns (5) and (7), which are annual averages of respective prices.

(9) The percent difference between P\_Enugu-urban imported (Pdom) in column 7 and the imported price P<sub>m</sub> (w/tariff) Enugu in column 6.

**FIGURE 7.6** Nigeria's domestic and import parity rice prices and rice imports, 2005–2013

Source: Authors' calculations based on Nigeria, NBS (2013b).

Note: Data are three-month lagged moving averages (MA).

to increased tariff evasion. Since 1998, there is little evidence of rationing of foreign exchange, as parallel market rates have been close to official exchange rates. Rice import tariff rates were kept at 100 percent from 1996 to 2007 (except for a one-year reduction to 75 percent in 2002). Wholesale prices of rice in this period appear to be somewhat less than the cost of imports plus transport and marketing margins to wholesale markets, suggesting that there may have been substantial tariff evasion in the 1996 to 2012 period.<sup>10</sup>

As shown in Figure 7.6, import parity prices (including the 100 percent import tariff) were broadly stable between 2005 and mid-2007. International rice prices rose sharply in 2007 and 2008, as did wheat and maize prices, particularly following restrictions on rice exports by India and Vietnam. In order to prevent a large increase in domestic prices of rice, Nigeria reduced its rice import tariff to zero in April 2008.

The rice import parity price, without tariff, dropped to below N 130 (Nigerian naira) per kg by August 2008, while domestic prices remained high. Imports thus appear to have been constrained during the period from mid-2008 through late 2009, a time when there were no official trade restrictions. The large gap between import parity prices and domestic prices suggests that there were substantial excess profits (rents) in this period. By early 2010, import parity prices with tariff had risen and were again approximately equal to the domestic price (at Enugu) until almost the end of 2011. Import

10 During the global food crisis of 2008, tariffs on rice were temporarily removed in an effort to mitigate the effects of high world rice prices.

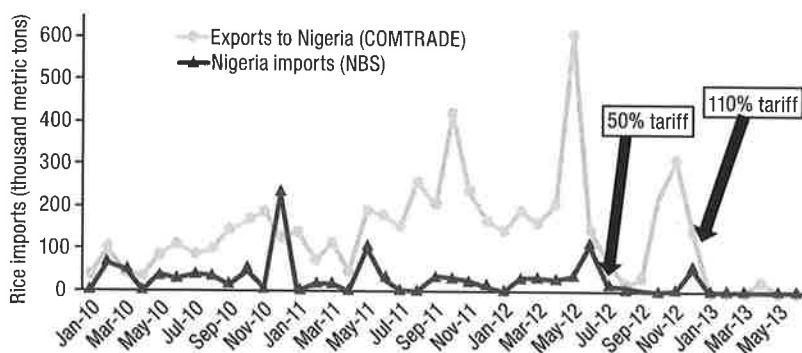
tariff rates averaged about 50 percent from mid-2009 through mid-2012, with potential tariff revenues (including any possible rents) estimated to have been about \$800 million per year (or N 120 billion, at N 150/\$1).

There was a substantial increase in the tariff rate toward the second half of 2012. Because of tariff evasion, however, this large jump in tariffs did not result in corresponding increases in domestic prices in major rice markets. Given that international prices were broadly stable during this period, the lack of response could be explained by an increased evasion of tariffs (in percentage terms) and no increase in total marketing margins between C&F and retail markets. But another explanation is that domestic sales came from ample imported rice stocks accumulated prior to the tariff increases. The bill introducing the new tariffs on rice was signed into law in April 2012. This law increased tariffs on polished/milled rice to 50 percent effective on July 1, 2012, and to 110 percent effective January 1, 2013. In May 2012, there was a large increase in rice imports (Figure 7.7), which may have been the result of increased purchasing in order to avoid the new tariff.

In August and September of 2012, recorded quantities of rice imports fell to near zero at the time of the tariff increase. By October 2012, the volume of rice imports had recovered in the COMTRADE data but remained very low in the NBS/customs data, suggesting even greater tariff evasion after the tariff increase (Figure 7.7).

Though cross-border land imports appear to have been relatively small in the 2009–2011 period, they may have increased substantially in 2013

**FIGURE 7.7** Nigeria's monthly rice imports, COMTRADE and NBS/customs data, 2010–2013



Source: UN Statistics Division (2012) and Nigeria, NBS (2013b).

Note: COMTRADE = United Nations Commodity Trade Statistics Database; NBS = National Bureau of Statistics.

following the major tariff increase in late 2012. Interviews with wholesale rice traders in Kano in October 2013 indicate that rice imports through Lagos declined precipitously, but that most imported rice was flowing from Benin through Niger, most likely by crossing into Nigeria at the Maradi-Memuja border.<sup>11</sup> How this might have occurred can be illustrated by a simple model showing the diversion of imports through other unofficial channels as tariffs are raised in the main Lagos port. The stylized model and results are discussed in Appendix F. From this example, the diversion of imports occurs so long as the cost of using unofficial channels is sufficiently lower than paying the tariff (inclusive of inland transportation and marketing costs). At some threshold tariff rate, all imports would be diverted from the official port of entry. Although this mechanism needs to be more formally investigated in future studies, it is consistent with the observed patterns of tariff revenues and flow of rice. The potential diversion of imported rice can pose uncertainty in tariff revenues and make them less reliable revenue sources for the government. Such uncertainty also creates challenges to rice-sector development policies that can be potentially financed by these revenues.

## Import Tariffs on Other Types of Rice

The above discussion focuses on tariffs on milled rice, but Nigeria's rice tariffs vary with the degree of processing, with higher tariffs levied on products that undergo more processing (e.g., polished rice) than on unmilled rice (paddy) or brown rice. Most of Nigeria's rice imports are classified as milled and semimilled rice, which includes a wide range of qualities of packaged milled rice. In 2012, milled and semimilled rice accounted for 67 percent of the total value of recorded rice imports; husked (brown) rice and broken rice accounted for 23 and 10 percent of the total value of imports (Table F.1 in Appendix F). Average tariff rates for brown rice were only 41 percent, as compared to 64 percent for milled and semimilled rice and 74 percent for broken rice.<sup>12</sup> To a large extent, as discussed in Chapter 6, these differential tariff

11 COMTRADE data show that Benin imports approximately 600,000 or more metric tons (Figure 7.3) of rice per year. With a population of 8.6 million in 2009, and assuming per capita consumption of 30 to 35 kg/capita/year (FAO Food Balance Sheets report 34.4 kg/capita/year in 2009 in Benin, and 26.9 and 27 kg/capita/year in Nigeria and Ghana, respectively), Benin's total rice consumption would be 258,000–301,000 tons. Given domestic net production of 100,000 tons and imports of 897,000 tons (COMTRADE) in 2009 (based on the figures of exports to Benin, rather than imports by Benin), consumption of imports would be 158,000–201,000 tons, leaving 696,000–739,000 tons to be re-exported.

12 Note that broken rice is also milled.

rates are an attempt to support the domestic milling industry by encouraging additional supplies of imported brown (husked) rice for light milling (polishing) to white rice.

### Effects of Import Tariff on the Price of Local Rice

As discussed in Chapter 2, slightly more than 50 percent of the rice consumed in Nigeria is produced and processed locally in Nigeria (local rice). By definition, import tariffs are not levied on local rice; taxing local rice would defeat the purpose of using import tariffs to protect domestic rice producers. However, it is possible that an increase in tariffs that raises the domestic price of imported rice will also lead to an increase in the price of local rice, because local and imported rice are to some extent substitutes in consumption.

The discussion of price trends in Chapter 2 suggests that the price of local rice responds to increases in the price of imported rice stemming from increased tariffs and other rice trade policies. Using the Enugu price data mentioned earlier as well as similar monthly price data from Niger State, whose time-series data are long enough to allow econometric analyses, Takeshima and Masias (2013) recently tested this formally using co-integration analysis. Their analysis tests for the relationship between changes in the price of imported rice and the price of local rice using monthly time-series data at Enugu for local rice price and the domestic market price of imported rice. In order to overcome the fact that sample sizes are still fairly small and that some series are nonstationary, they use the Autoregressive Distributed Lag (ARDL) model from Pesaran et al. (2001), which is more robust to small samples than conventional models. They obtained the following long-run relationships for Enugu between January 2006 and December 2010:

$$P_{iL} = 0.739 + 0.206P_{mM}^* \quad (5)$$

$$P_{iL} = 0.477 + 0.329P_{mM} \quad (6)$$

where  $P_{iL}$  and  $P_{mM}$  are the observed market prices of local rice and imported rice, respectively;  $P_{mM}^*$  is the calculated import parity prices as discussed above and defined in equation (2) above; and 0.206 and 0.329 are estimated coefficients.<sup>13</sup> The estimates indicate that a 1 naira increase in the border

13 As long-run estimates, they do not signify a specific length of time. Rather, they indicate how prices converge over time to these relationships, which the ARDL model can detect. While the speed of such convergence is unknown, true price movements cannot deviate too far from this. Further detail on estimation methods and other technical matters can be found in Takeshima and Masias (2013) and are available upon request.

price of imported rice caused by increased tariff increased the price of local rice by about N 0.20. Similarly, a 1 naira change in the domestic market price of imported rice induces a 0.33 naira increase in the price of local rice. Based on the supplementary analysis through the Structural Vector Autoregression model for stationary segments of the data (Enugu, January 2003 through December 2010; Niger, January 2007 through December 2011), Takeshima and Masias (2013) find that a change in import parity price does not affect the price of local rice within the same month and only modestly affects it in the following month. In short, while import tariff may cause an increase in the price of local rice, the transmission is partial, small, and not instantaneous.<sup>14</sup> The implication is that tariffs and other protectionist trade policies may not provide the producer price incentives that policymakers hope for, as is also demonstrated in Chapter 4.

## Conclusion

For most of the past four decades, trade and macroeconomic policies have combined to reduce incentives for domestic production of rice and lower farmer revenues from rice. Moderate tariff protection from the 1970s through the 1990s did not compensate for the macroeconomic bias against domestic rice production that occurred in periods of substantial appreciation of the real exchange rate. Moreover, the high tariff rates in the 2000s have not been totally effective in raising real prices of rice.

High tariff rates for rice did not raise substantial government revenue due to tariff evasion (most likely through underinvoicing of imports or evasion of customs altogether). The lack of a price response following the 2012 tariff increase is further evidence that, due to the high level of tariff evasion, tariff policy is a very blunt instrument for affecting domestic prices. Nonetheless, the domestic market price of imported rice is substantially higher than the import parity price without tariff, suggesting that tariffs and costs related to tariff evasion (bribes, etc.) substantially raise prices for consumers.

A number of key messages emerge from this chapter. First, rapid increases in the demand for rice and the inability of domestic production to meet this increased demand imply that rice imports in Nigeria are likely to continue to grow in the near future, despite the government's effort to decrease imports

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14 Estimating the exact length of time for full transmission is left for future studies, as it requires longer data series under relatively stable international prices, where the effects of tariff changes can be clearly separated from price movements in the international market.

through trade policies. Second, increased protection through higher tariffs has not decreased rice imports to Nigeria; rather, it has encouraged tariff evasion and unofficial imports. Efforts to evade tariffs in the future can be expected, as tariffs are difficult to enforce. Finally, because of tariff evasion, not all tariff increases are transmitted to the domestic market in the form of higher domestic prices of imported rice; the divergence between the import parity price and the domestic price of imported rice increases with higher tariffs. Cointegration analysis shows that only about 20 percent of the import tariff on rice and 33 percent of changes in the domestic price of imported rice respectively are transmitted to the price of local rice. This suggests that local producers do not get the benefit of higher prices that higher tariffs are supposed to bring them.