

Agrifood Foreign Direct Investment and Waves of Globalization of Emerging Markets: Lessons for U.S. Firms

By Titus Awokuse and Thomas Reardon

European and U.S. trade and foreign direct investment (FDI) into the agrifood sector of developing and emerging economies in Africa, Asia, and Latin America have been important for 500 years. As the economic and policy context has evolved, globalization has proceeded in three recent (in the past 500 years) waves. The first wave, from the 1400s to the 1970s, focused mainly on European (and later U.S.) FDI into and trade with Africa, Asia, and Latin America. Importantly, this wave included only “vertical FDI,” with plantations, first-stage processing, and trade “entrepots” in those regions and second-stage transformation and receiving facilities in the home countries.

The second wave of globalization, from the 1980s to the present, focused again on European and U.S. FDI into and trade with the emerging economies (which we simplify to emerging markets, or EM) in Africa, Asia, and Latin America. This wave followed the liberalization of national EM trade regimes and the global agrifood economy. It was also motivated by the rise of the EM domestic markets. The second wave thus continued with some vertical FDI, but also included extremely large horizontal FDI to make and sell inside the EMs themselves.

The third wave of globalization differs from the first and second waves not by the market but by the actors. In particular, the third wave

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features exports from and FDI by EM agrifood enterprises, both domestic and regional, and increasingly EM-based global multinationals. These EM firms took off in the 2000s and 2010s, emerging out of the rich soil of the rapidly growing and transforming EM markets—just as U.S. firms like Cargill, ADM, and Dole had taken off over a century prior, a time of similar, albeit more gradual growth and transformation of the U.S. agrifood economy. The new EM firms compete with or sometimes partner with U.S. and European firms.

This paper discusses the evolution of the three waves of globalization, focusing on the roles and strategies of FDI and trade of agrifood firms (those involved in farm inputs, farming, wholesale, processing, and retail) in EMs. Section I presents definitions and concepts. Section II briefly reviews information from the first wave, which is well treated in the historical literature. Section III discusses the second wave and links the external firms' FDI and trade strategies and actions with the evolution of domestic EM food economies. Section IV delves into the nature of the emerging third wave, a relatively new topic and not yet adequately treated in the literature. Section V uses the evolution of these waves of globalization to draw lessons for U.S. firms undertaking current and future global strategies.

I. Definitions and Concepts

In addition to imports and exports, U.S. and European firms have sent into Africa, Asia, and Latin America both vertical FDI and horizontal FDI (terms introduced by Horstmann and Markusen [1992], Markusen [1984], and Helpman [1984]). “Vertical FDI” is undertaken when supply chains are spatially fragmented over their vertical stages, such as FDI in a banana plantation in Central America and ripening and wholesale distribution facilities in the United States. “Horizontal FDI” is undertaken when a company sets up FDI affiliate operations—such as farms, factories, or service firms—in a country in which it wants to sell at least part of the products from those operations to host country consumers or firms (such as McDonald's making and selling burgers in Mexico).

The demand-side condition for horizontal FDI is that the FDI firm perceives effective demand in that country. The supply-side condition for vertical or horizontal FDI is that the FDI firm has some advantage

in the host economy, such as being a “first mover” in a product or technology, having lower capital costs, or having specialized knowledge. Examples include FDI from General Foods and Nestlé into Mexico in the 1980s and FDI from Walmart into Mexico in the 1990s.

Theorists have set out models of firms’ choice of vertical versus horizontal FDI. There are two main strands of theory. The first strand tends to focus on the supply-side comparative advantage of the FDI firm. A leading example is Markusen’s (2002) generalized model of the determinants of the dichotomous choice between horizontal and vertical FDI and trade (though the model is applicable to the choices as a continuum or even overlapping sets). He called it the “knowledge-capital” (KC) model. It was applied empirically to the agriculture and food sector (as an aggregate) compared with various nonagrifood sectors by Awokuse, Maskus, and An (2012). The basic idea of the KC model is that a firm will undertake FDI in the host country just to supply the (FDI firm’s) home country if factors (land, labor, or natural resources) are cheaper in the host than at home; if the supply chain can be “fragmented” into a series of segments in different places (as when ingredients for the final product are produced in one place and processed into final form in another); if the domestic market in the host country is small or lacking; or if the FDI firm has some advantage (in particular, R&D, special skills, or a market network) that allows it to organize a value chain with the host as the upstream and the home country as the downstream.

The second strand of theory tends to focus on the host-market demand perspective. A leading example is the Product Cycle theory, a concept from classical economists such as Ricardo that was then formalized as part of a link to trade theory by Vernon (1966, 1979). Translated into the context of the agrifood economy, the essential idea is that a product has a life cycle that starts as a new product or niche and is then commoditized into a bulk and widely distributed product, perhaps growing and diffusing over national markets, until it reaches “maturity.” At that point, its profitability has been competed down, and the product either declines, “dies,” or transitions into differentiated products that themselves are niche products and again grow into commodities.

This theory focuses mainly on the determinants of demand in the host country. These determinants are mainly whether the innovation product from the home country has a demand market in the foreign

country based on the income of consumers and the (factor) opportunity costs of consumers. For example, if the innovation is a consumer time-saver, such as a washing machine or processed packaged food, the U.S. innovating firm would look for countries with sufficient consumer income or demand for time-saving products to export the product to that country. As costs of production in the country (or transport costs to the country) justify FDI in place of exports, the firm would undertake FDI in the country. The “tipping point” for the firm to undertake FDI might be other multinational enterprises (MNEs) or domestic firms beginning to imitate the product. In this case, the FDI firm will want to cut out transport costs and produce the product in the host country to more effectively compete.

II. First Wave of Globalization (1400s to 1970s): Vertical FDI in Host Country Plantations and Trade Depots

The development of trade routes during this period led to many new products being traded to and consumed in the home countries and produced in the tropics. The quest for trade was integrated with exploration: Columbus was sent by Spain to find an alternative route to the Indonesian “spice islands” to undercut the Portuguese monopoly and “stumbled on” America in his path (Milton 1999).

Four forces drove FDI and trade in this period. First, charter companies and MNEs from European countries and later the United States competed for plantation and trade depot bases. Second, transportation technology rapidly transformed (compared with the previous millennium), with changes in sailing boat design, the rise of product-fitted steamboats, and trains. Third, domestic markets developed in Western Europe and later the United States from increases in incomes driven by industrialization and urbanization. As incomes rose, consumers sought variety (tropical products) and deseasonalization as well as reductions in prices for products such as dried cod. Fourth, companies and governments sought substitutes for an initial monopoly of a country, product, or exporting region. For example, from the 1500s to the 1900s, the Dutch pursued Icelandic cod as an alternative to Norwegian/German cod via the Hanseatic League. England sidestepped the Dutch’s lock on cod by founding colonies (before the Pilgrims) in Massachusetts (“Cape Cod”) and Newfoundland (Kurlansky 1998).

The charter companies and MNEs such as the U.S. United Fruit Company undertook FDI in a vertically integrated (VI) and economically, politically, and militarily integrated fashion along the supply chain: plantations and collection centers for sourcing from smallholders; trade depots and first-stage processing factories in tropical countries (or in temperate ones such as Cape Cod); transport facilities and train, boat, and port systems in sending and receiving areas; storage and second-stage processing facilities in home countries; and concomitant investments by companies and their governments in military and political support for these operations.

Interpreted under the Product Cycle view, the home market's demand was the impetus for innovation not only in processing technology in the home and host countries but also in transport technology and military and governance institutions for colonization and trade. The FDI was limited to vertical FDI because there was as yet little or no local demand for a commoditized form of the products in the host countries during this period.

The main trade was in tropical products such as sugar, rubber, coffee, spices, tea, jute, cotton, bananas, and pineapples from Africa, Asia, and Latin America to European, U.S., and Chinese markets. The FDI typically identified a niche local product in one tropical region and developed it into a commodity in the initial area or introduced it into other regions. As these products were exported to Europe and the United States, they moved from exotic niches to basic commodities over time.

III. Second Wave of Globalization (1980s to Present): U.S. and European FDI into Emerging Markets Shifts from Only Vertical to Mainly Horizontal

The second wave of globalization differs from the first in several key ways. In the first wave, the great majority of agrifood FDI was upstream in the supply chain in plantations, associated trade and transport, and first-stage processing. In the second wave, agrifood FDI has been mainly midstream and downstream in first-stage processing (milling), second-stage processing (manufacture of consumer-ready foods), logistics, retail, and food service. In addition, most FDI in the first

wave of globalization was in tropical food and fiber; in the second wave, most FDI was in grains, meat, dairy, and produce.

The second wave also differs from the first in that most FDI has become horizontal, rather than vertical (though some vertical FDI has continued). In other words, the EMs have become a market rather than only an export platform back to the United States and Western Europe. Furthermore, the second wave has seen a great deal of capital and knowledge transmission (in the first wave, there was little capital or knowledge transmission beyond the FDI export enclave).

Finally, the two waves of globalization differ in the role played by governments. In the first wave, the home governments played a direct, interventionist role. In the second wave, home governments play an indirect role, promoting policy “conditionality” so that host governments implement supportive policies and infrastructure to help U.S. and Western European FDI in and exports to Africa, Asia, and Latin America.

Drivers of horizontal FDI into EMs in the second globalization

Several key changes occurred in EMs from 1980 to 2010 that provided an impetus for U.S. and Western European horizontal FDI in processing and retail as well as in farm inputs and agriculture in Africa, Asia, and Latin America.

First, there were major policy changes that made EMs much more accessible as destinations for both exports and FDI. There were widespread Structural Adjustment Policies and transitions away from “command and control” and socialist economies toward liberalization of markets and FDI and privatization of agrifood parastatals.

Second, demand changed rapidly from the 1970s to the present. For example, income growth and urbanization changed the face of the food markets in EMs. South Korea urbanized as much in 20 years as the United States had in 100 years. In 1970, the shares of the urban in the total population were 24 percent in Asia and Africa and 55 percent in Latin America; in 2010, the shares were 45 percent in Asia, 40 percent in Africa, and 75 percent in Latin America. In addition, diets changed deeply over this period. Demand for time-saving foods and shopping modes—such as processed foods, fast food, and supermarkets—rapidly increased. This shift was correlated with rapid urbanization and women entering the away-from-home workforce. The latter increased

women's opportunity cost of cooking and shopping and led to a very rapid spread of purchased-processed foods and supermarket chains, especially from the 1990s on. Demand for nonstaple foods (meat, fish, poultry, dairy, horticulture products, and edible oils) also grew rapidly from the 1970s to the present. The animal product demand, in turn, has spurred rapid growth in demand for soybeans and yellow corn for feed.

Third, supply changed rapidly in EM countries over the past several decades. On the one hand, EM governments, especially in Asia and Latin America, have made large public investments in road, port, and electrical infrastructure. While much of the supply chain infrastructure of the first wave of globalization was geared toward the movement of tropical products to ports, the infrastructure in the second wave has been more connected with domestic markets, internal production zones, and linking rural to urban areas. On the other hand, there has been major technological change in EMs, much of it transferred from technology innovation in the United States and Europe. These changes occurred along the supply chain, from the use of farm chemicals and new seeds and mechanization in the Green Revolution (starting in the 1960s and 1970s) to changes in processing, transport, and storage technologies post-farm-gate (Reardon and others 2018).

The upshot of these changes was that starting in the 1980s, EMs became attractive destinations for exports from the United States as well as horizontal FDI in the food markets (Henderson, Handy, and Neff 1996). The latter are growing in volume five to 10 times faster than the "mature" U.S. and Western European markets. Moreover, with urbanization, the diffusion of supermarkets, and the gradual emergence of modern wholesalers and logistic companies, the EM markets have moved from being fragmented to having more integrated and agglomerated domestic markets. This has reduced the transaction costs to export to them or to sell to them from an FDI base.

Waves of transformation and FDI over countries and products

Despite heterogeneous conditions, there is some regularity in the "waves" of diffusion of both FDI (from the United States and Europe) and domestic agrifood sector transformation in EMs, over countries and within countries, and over products.

The first wave of transformation was in countries that started their post-World War II growth spurt, urbanized, and industrialized earlier—in particular, South American countries, East Asia outside China, and South Africa. Processing transformation (the rise of large processors) began to occur with FDI liberalization and the start of privatization in the mid-1980s and early 1990s. Processing transformation “took off” mainly in the 1980s, while retail transformation (the spread of supermarkets and fast food chains) began in the early 1990s.

The second wave of transformation was in countries that had their growth and urbanization spurts later or had prolonged internal socio-political pressure to limit FDI. In Central America, Mexico, and Southeast Asia, processing transformation took off in the 1980s, but processing and retail transformation did not start until the mid- to late 1990s.

The third wave of transformation was in countries such as in China, India, and Vietnam that had their growth and urbanization spurts mainly in the 1990s and 2000s or had lagged liberalization into the 1990s. Processing transformation occurred somewhat before retail transformation, with the latter mainly beginning in the late 1990s and the 2000s. In addition, processing and retail transformation began in parts of Africa late in the third wave (or perhaps in a fourth wave).

In each country, the transformation (and the FDI) also took place in waves over products. The transformation of processing, retail, and wholesale of grains (and processed grains) took place earlier, benefitting from economies of scale and then scope. This transformation was followed by transformation in semiprocessed foods such as meats and dairy. The last wave of transformation was in fresh horticultural products.

Retail transformation and FDI

After the liberalization of retail FDI and the privatization of state retail, private investment in EM supermarket chains surged in the 1990s and 2000s (Reardon and others 2003). The FDI from Western Europe and the United States was fueled by push factors (saturated home markets with low margins) and pull factors in EMs (higher returns and initially light competition combined with growing demand) (Reardon and Berdegúe 2002).

Supermarkets spread in waves in EMs, taking off from the late 1980s through the present. By country, supermarkets spread first

among the upper, then middle, then lower classes; from large cities to secondary cities to rural towns; and shifted from a focus on dry foods (and nonfood) to semiprocessed to fresh produce (Reardon and others 2003). These paths were similar to those trod more gradually in the United States.

The share of modern retail in overall food differs over the waves of diffusion, with the deepest penetration to date in the first-wave countries: the share was near half by the late 1990s and 50 to 60 percent in the 2000s. In the second-wave countries, the share was about 30 to 50 percent by the 2000s, and in the third-wave countries, the share was 10 to 30 percent. The fastest spread was in the third-wave countries in Asia, where the supermarket sector grew at three to five times the rate of gross domestic product (GDP) per capita growth (Reardon and others 2012).

As an illustration, we show the rapid pace of growth in the Latin American supermarket sector, drawing from Popkin and Reardon (2018). Table 1 reports retail chain sales of edible groceries for 2002, 2006, 2011, and 2016 along with compound annual sales growth rates compared with real GDP growth rates. The data are from Planet Retail, a retail services and analysis company that tracks the leading chains in each country. Planet Retail does not track smaller local chains, regional (in-country) chains or independent stores, so the sales data underestimate all modern food retail. But the table nevertheless provides a rough idea of trends, and no official data exist for comparison. We show data for 12 countries covering about 100 chains. The table shows that food sales from chains increased from \$40 billion in 2002 to \$154 billion in 2011, a fourfold increase. The real increase is lower, but we report the nominal increase here because the inflation data are ambiguous.

For comparison, using the same data source, roughly the same time period, and the same method as Popkin and Reardon (2018), Reardon and others (2012) show that modern food retail sales in East and Southeast Asia grew from about \$51 billion in 2002 to \$198 billion in 2009, a similar fourfold increase to that found in Latin America.

To become cost-competitive with traditional retail, supermarket chains (whether MNEs or the leading domestic firms in EMs) have increasingly modernized their procurement systems. The capacity for such modernization was related to the transfer of procurement

Table 1
Edible Grocery Sales of Leading Modern Retail Chains and GDP Growth over Selected Latin American Countries (2002–16)

Waves	Sales 2002	Sales 2006	Compound sales growth 2001–06 (percent)	Compound real GDP growth 2002–06 (percent)	Sales 2011	Compound sales growth 2006–11 (percent)	Compound real GDP growth 2006–11 (percent)	Sales 2016	Compound sales growth 2011–16 (percent)	Compound real GDP growth 2011–16 (percent)
First wave										
Argentina	3,057	5,036	13	9	12,207	19	4	13,656	2	-0.2
Brazil	19,110	36,853	18	4	92,039	20	4	72,019	-5	-0.4
Uruguay	344	504	10	4	1,253	20	6	1,450	3	3
Second wave										
Costa Rica	563	1,059	17	5	2,058	14	4	2,711	6	4
Chile	2,101	4,778	23	6	11,300	19	4	11,536	0.4	3
Colombia	2,032	3,099	11	5	5,892	14	5	6,038	0.5	4
Ecuador	566	853	11	5	1,576	13	4	2,251	7	2
Guatemala	377	512	8	4	1,055	16	3	1,036	-0.4	4
Mexico	11,368	17,155	11	3	24,331	7	2	22,027	1	3
Third wave										
Bolivia	28	43	11	4	92	17	5	179	14	5
Nicaragua	46	128	29	4	290	18	3	563	14	5
Peru	251	365	10	6	2,251	44	7	2,856	5	4

Notes: All sales are in nominal millions of U.S. dollars. Brazil's fall in sales from 2011–16 can be explained by the 2015–16 crisis, where GDP fell and a number of the mayor retailers (Casino, Carrefour, and Walmart) reported a decrease in their sales. We use 2015 sales data from Mexico as for 2016, retail planet reported a fall in sales, yet all news articles reported an increase. Source: Popkin and Reardon (2018).

technology from U.S. and Western European chains and its further diffusion among leading domestic chains (Reardon and others 2003). The supermarket chains in EMs have started to buy directly from processors (including under contracts), specify private standards, use centralized procurement and logistics via distribution centers, and use specialized-dedicated wholesalers who distribute to their stores and organize procurement from suppliers according to volume, quality, and timing specifications (Reardon and Timmer 2012). These modernizations have gone by far the furthest in processed and semiprocessed foods but have started to be applied to fresh produce as well (see, for example, Berdegué and others [2005]).

Food processing transformation and FDI

Similar to the retail sector, the processing sector has transformed in structure and conduct with the heavy influence of FDI from the United States and Western Europe. The processing sector in EMs has undergone three phases of transformation. These phases are depicted as a J curve by Reardon (2015), with concentration on the vertical axis and time on the horizontal axis. The shift from the left to the middle of the J was a move from a semiconcentrated to a deconcentrated processing sector (with the shift from the 1970s/1980s era of parastatals to the proliferation of SMEs with liberalization and privatization from the 1980s to 2000s). The shift from the middle to the right of the J was a move from a fragmented sector to an again concentrated one with the deluge of FDI and domestic private-sector-driven consolidation. The second and third phase tend to overlap in most EMs, with the consolidation phase more advanced in the “first-wave countries” and less advanced in the others.

Following the privatization of the EM parastatals, there was a proliferation of small and medium-sized enterprises (SMEs) in processing grain, dairy, meat, fish, and produce both to fill the gap left by the demise of public-sector operations in EMs and to meet growing urban demand. This is what Reardon and others (2012) call the transitional stage of the agrifood value chain transformation. Examples include dairy, wheat, and horticultural product processing SMEs in Brazil and maize, vegetable, and fruit processing in Africa (Farina and others

2005; Farina 1997; Broutin and Bricas 2006; Jaffee and Morton 1995; Rubey 1995; Tschirley and others 2015).

Privatization and FDI liberalization led to an avalanche of FDI in processing from Western Europe, the United States, and then Japan in the past two to three decades. As a consequence, foreign firms formed a major share of the processing sector in a number of first- and second-wave countries by the end of the 1990s, and the trend started in third- and even fourth-wave countries in the 2000s and 2010s. (They were joined by EM MNEs in the third wave of globalization, as we discuss later.)

The (re-)consolidation phase comprises both first-stage and second-stage processing. Some companies specialize in one—for example, ADM conducts mainly first-stage processing for ingredients. Others straddle the two—for example, Nestlé handles milk collection, first-stage processing, and second-stage milk processing into confections.

The first subphase of the consolidation phase was FDI in first-stage processing of grain and edible oil products globally and for internal markets of countries receiving FDI. The case of soy is illustrative. Brazil independently began soy production in the 1970s for the European and then the Chinese market, as animal production soared from the 1980s to the present. Brazil very quickly grew as a soy producer: its output in 2000 was similar to the output of the United States in 1970, and by 2015, its output was neck and neck with that of the United States. But the United States had a head start on investment and well surpassed Brazil in investment in first-stage processing by firms such as ADM and Cargill. These firms had grown from small to large while the U.S. agriculture and food industry grew from the 1870s through the 1970s. By the 1980s, the United States had achieved technological leadership in many of the agriculture and food-industry-related fields as well as a massive capital base—and low returns in a highly contested home market. The 1980s and 1990s were thus a period of intense outward FDI, especially for first-stage processors such as ADM and Cargill, which set up operations in Brazil and Argentina as FDI rules were liberalized and soy production there took off. The 1990s and 2000s were another wave of outward FDI for the same pull and push reasons by food industry firms such as Smithfield (in first- and second-stage processing) and Kraft. Firms such as ADM set up cross-country FDI networks in China (receiving soybeans), Brazil (sending raw and processed soybeans), and Western Europe (receiving raw and processed soybeans).

The second subphase of consolidation and third phase of the J curve was in second-stage manufactured foods. FDI was typically “horizontal” into EMs to sell to their extremely fast-growing markets for processed foods.

Again, the United States’ prior experience of food industry transformation prepared U.S. firms to be important in horizontal FDI in EMs. Firms that had been small enterprises in the early stages of food system transformation in Western Europe and the United States in the latter part of the 1800s and the first half of the 1900s became the technological leaders and giants of outward FDI by the 1970s and 1980s. In addition to their experience, the competition in their home markets pushed them to outward FDI. The draw was clear: packaged food sales were growing only 2 to 3 percent annually in developed countries compared with 13 percent, 28 percent, and 7 percent in low-, lower-middle, and upper-middle income developing countries, respectively (Wilkinson and Rocha 2009).

An archetypal example of the second-stage processing sector FDI was that of dairy and Nestlé. Nestlé (and several other large dairy firms such as Parmalat) swept into Latin America in the 1980s following FDI liberalization and income growth and undertook many mergers and acquisitions, such as in the dairy sector in Brazil (Farina and others 2005). By the 2010s, Nestlé had a 61 percent market share in Latin American packaged foods (confections, soups, pet food, baby food, dairy, and baked goods). Cook (1985) shows that similar processes took place with U.S. food multinationals in Mexico in the 1980s. These processes continued elsewhere in Latin America from the 1990s to the present.

Wholesale and logistics transformation and FDI

While governments played a major role in the development and transformation of wholesale markets, the overall segment of wholesale and logistics underwent changes similar to those in processing.

First, as with the left-most part of the “J curve,” governments directly induced a first stage of wholesale transformation from traditional, fragmented wholesale to government-run wholesale markets (of private wholesalers) and distribution parastatals (such as the Food Corporation of India). This shift created economies of agglomeration and sometimes economies of scale relative to the traditional fragmented wholesale sector, such as in Africa (Tollens 1997). The large markets

created by this investment are huge. For example, Mexico City's wholesale market is the largest in the world. And China's wholesale market volume increased 11,000 percent from 1990 to 2000 (Huang and others 2007; Ahmadi-Esfahani and Locke 1998).

Second, the traditional wholesale sector has been restructuring in several ways. The public-sector wholesale market segment is consolidating wholesale markets in some countries, such as South Africa and wholesalers within wholesale markets in others, such as Mexico (Louw and others 2007; Echánove and Reardon 2006). In some countries, there is also evidence of a decline in the share of traditional village brokers but a proliferation of rural town and secondary city wholesalers in Asia (Reardon and others 2012).

Third, beyond the traditional wholesale sector, a modern wholesale sector is emerging. This can be called "re-intermediation"—a shift in procurement among supermarket and fast food chains and large processors from the traditional fragmented spot market to, as much as possible, specialized, dedicated wholesalers (Reardon and Berdegué 2002).

Co-evolution of downstream and midstream segments and links to FDI

First, domestic processing and agribusiness firms as well as FDI MNEs (via "follow sourcing," discussed later) have been established in the EMs. FDI retailers (as well as large domestic retailers) and processors have begun to source directly from these large local firms, cutting out intermediation. For example, Walmart and large domestic chains in Mexico shifted from sourcing from the wholesale market to sourcing from the U.S. firm Driscoll's for strawberries produced by Driscoll's in Mexico (Reardon and others 2007).

Second, large-scale firms in different segments facilitate each other's growth through "co-evolution." To reduce transaction costs and make sure private standards are met, supermarket chains tend to source from large processors. For example, large processors target product differentiation to the requests of supermarkets such as Carrefour and Walmart in Brazil, for example, for milk and juice products by Nestlé in Brazil (Farina and others 2005).

Third, modern retailers in EMs have been shifting from using traditional wholesale channels for procurement to using modern (dedicated) wholesalers and "third-party logistics" (3PL) firms. The emergence of

these modern or new-generation wholesalers and 3PL firms helps the retailers to outsource (to these wholesalers) the imposition of their private standards and other transaction requirements, such as specific packing; to face a shorter supply chain and thus lower transaction costs; to overcome idiosyncratic market failure in logistics and other intermediation services that are common in the traditional food markets of developing countries; to reduce market risk by having longer-term relations with distribution companies rather than relying only on the spot market; to use incentive pricing and relationships to encourage (or require) wholesalers and third-party logistics firms to undertake supply chain investments, such as in cold chain, or even backward-integrating by investing in a packing plant and organizing contract farming schemes (see Reardon and others [2007] for the case of lemons in Mexico); and to avoid traditional wholesale markets to the extent possible, as supermarkets often consider these markets to deliver low and inconsistent quality at relatively high transaction costs.

To obtain these logistics services and other services, FDI firms in EMs often require “follow sourcing” of their service providers in home markets. U.S. and Western European retailers (as well as large processors) operating in EMs sometimes prefer to “import” the services of processors, wholesalers, and especially 3PL firms on which they rely in their home markets or globally. This “importation” can be both into the region or country of the retailer or across zones in a country as the retailer spreads its stores. For example, Dries, Reardon, and Swinnen (2004) note that in April 2003, Tesco signed an agreement with the U.S.-based multinational ProLogis for the lease of a large distribution center in the Czech Republic. Reardon and Berdegue (2002) note that the Carrefour distribution center in Brazil was a product of a joint venture between Carrefour, Cotia Trading (a major Brazilian wholesaler distributor), and Penske Logistics (a U.S. global multinational firm) that started in 2001.

Moreover, as local and regional agrifood production capacity has grown in EMs, especially over the past three decades, there has been a tendency to undertake joint ventures in addition to the usual main mode of FDI via mergers and acquisitions, and to a much lesser extent, greenfield investments. The arrangements take several forms. The first form is co-processing, which has become increasingly common (as with

Kellogg's or Nestlé) as the domestic processing sector has developed in EMs. The second form is joint ventures, such as U.S. companies partnering with fruit companies in the southern hemisphere to eliminate seasonality using “north-south corridors” (for example, the joint venture between Naturipe in the United States and Hortifrut in Chile, with operations in Mexico for berries).

IV. The Rise of the Third Wave of Globalization: FDI from Emerging Markets into Emerging Markets

There are several key differences between the second wave of globalization and (since its start in the 1990s) the contemporaneous third wave of globalization. In the second wave of globalization, FDI was mainly focused midstream and downstream. In the third wave of globalization, FDI is beginning to reemphasize farming and first-stage processing and reintroduce the importance of vertical FDI (while also featuring substantial horizontal FDI).

In the second wave, Europe and the United States were the main leaders in FDI, and developed countries were the only leaders. However, in the third wave, EM firms are rising and will be perhaps equal or greater over time in FDI compared with U.S. and European firms. In the second wave, the leading EMs were the main EM target of FDI. In the third wave, the “second rung” of newly emerging markets (such as Nigeria in Africa) will be increasingly major targets of FDI. Finally, in the third wave of globalization, home governments (of FDI firms) will return to the key roles they had in the first wave, providing more than just “policy support” (for example, the Chinese government is investing in Brazil's infrastructure as an export platform to China).

Patterns in the third wave of globalization: echoes of the first and second waves

Many of the U.S. agrifood MNEs dominant in the second wave of globalization had developed from small and medium firms like Cargill and John Deere. These firms started as small enterprises in the 1800s and then “grew up” during the transformation of the U.S. agrifood system from the 1880s to 1980s—“hitching their wagons to a star.” When they reached a large size and faced a contested or inadequate home market, they began interstate and then international FDI. They

first acquired similar firms in other developed regions (just as Nestlé bought Carnation in the 1980s), and then moved into EMs—first into the early risers, such as Brazil and Mexico, and then into the intermediate and recent risers, such as India and China.

In parallel fashion but later on, as EMs' agrifood economies grew and transformed rapidly from the 1980s to the 2000s (much faster, in fact, than the agrifood economy of the United States in the century before), an increasing number of small and medium enterprises in EMs grew into giant agrifood MNEs by 2010.

Another important parallel of the third wave of globalization to the first is that governments and companies in EMs are making large investments in infrastructure in “lower-rung” countries. The purpose of this investment is either to improve the supply chain of exports to or from the host country or to improve the political acceptance of FDI by the host country. A key example is the “Belt and Road Initiative” of China to build infrastructure in Asia and Africa to connect with them as well as Europe. This initiative is similar in purpose and economic approach to the United States' infrastructure investment in the Philippines in the 1900s or Britain's infrastructure investment in Africa and Asia in the 1800s. In 2017, China invested \$20 billion in Brazil in the energy, logistics, and agricultural sectors. Some of that investment has been in improving poor interior infrastructure to get soybeans to ports and on to China.

Examples on the export side from large firms in EMs to other EMs include exports of frozen chicken from large companies like Sadia in Brazil to Nigeria and Thailand; exports of frozen fish by Chinese companies to the United States, other Asian countries, Europe, and Africa; exports by Bimbo of Mexico, now the largest baked goods firm in the world, all over the world but especially to Latin America; and exports of first-stage-processed soy by Grupo Maggi, the largest soy farming and processing operation in the world, to Europe and China.

Examples of emerging regional FDI by regional multinationals include Nando's, a South African retail fast food chain with 1,000 outlets in 30 countries in Africa, Asia, Europe, Canada, and the United States; Alibaba, a retail/wholesaler that recently invested \$200 million in India to buy the Indian food delivery app Zomato; Charoen Pokphand (CP) in Thailand, with sales of \$45 billion (two-thirds the size of ADM), with the largest shrimp farm in the world in Indonesia, feed mills all

around Asia, and many other investments in Asia and Africa; COFCO Group in China, which has \$34 billion in sales (compared with Mondelez International, which has revenues of \$26 billion) and important investments in Asia and Latin America; and Bimbo in Mexico, with \$15 billion of sales (about the same as General Mills), plants around Latin America, and operations in the United States.

Moreover, large EM regional multinationals have also acquired large U.S. and European agrifood companies. Examples include the Chinese company Shuanghui's 2014 acquisition of the U.S. company Smithfield Foods, which had been the largest pork processor in the world, and ChemChina's 2017 purchase of Syngenta.

V. Implications for U.S. Suppliers

The second and third waves of globalization present U.S. firms with opportunities and challenges as well as needs for investment. The opportunities are both for horizontal and vertical FDI.

Horizontal FDI is warranted because of rapidly transforming EM markets with deep and growing demand for processed foods and diversity in meat, fish, dairy, and produce. Exporting to these markets, as well as FDI to be competitive with local EM firms as well as other MNEs, are both opportunities. Besides growth, EMs are becoming far easier for FDI firms to operate in or export to due to urbanization and rapidly improving road infrastructure. For the leading EMs, such as China, the infrastructure on the Eastern seaboard is already as good or better than U.S. infrastructure. EMs that are still catching up, such as India, still face infrastructure challenges, and urbanization sometimes increases transaction costs through congestion rather than reducing them through agglomeration.

Moreover, growth in EMs is moving beyond the lead countries of a decade or two ago and into countries such as Nigeria. The same kinds of transformations seen in leading EMs (increases in incomes, the growing opportunity costs of women's time, and demand for quality and product differentiation) are emerging quickly in what were once "second-rung" countries.

Finally, the improved infrastructure and complementary business structure in many EMs means that there are opportunities to build export platforms to developing as well as developed countries. Previously,

we gave the example of Smithfield using Eastern European pork production and first-stage processing bases to supply cheap commodity pork to sophisticated and branded Western European operations' second-stage processing and distributing. But this will be an opportunity more and more from and to EMs themselves, such as U.S. FDI firms producing inputs in Myanmar to ship to FDI finishing operations in China.

Complementarity is also ripe for more joint ventures with EM firms, not just for interseason production of produce, as at present, but for increased production for the local EM as well as exports to "second-rung" EMs that are fast becoming major markets.

The challenges are born from these opportunities (and vice versa). While European and Japanese firms have been both competitors and partners in EM markets (as in China, where Land O'Lakes and Graceland Fruit had European and Japanese joint ventures as well as Taiwanese joint ventures in FDI), the competition will intensify for FDI operations with these countries in the EM markets. Moreover, many EM firms are now or soon to be the equal of U.S. firms. EM firms will buy more and more U.S., European, and Japanese agrifood firms to compete in EM markets as well as the U.S. home market. The era of sharp differences in technical knowledge is largely over, so competition will intensify quickly. U.S. trade policies may also be a determinant of how easy and how welcome U.S. firms' FDI and exports will be.

All of these challenges and opportunities have investment implications. It is not to be forgotten that in the first wave of globalization, once one European power invested in infrastructure systems in an FDI host country, other European firms and countries ran to do the same. It is likely that in the next decade, the U.S. firms and perhaps government will be in a similar position with China for the EMs. Moreover, U.S. firms probably have less and less inherent advantage in any food product (depending on the product), and will have to constantly invest and seek comparative strengths in a new world triply globalized.

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