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Joseph Burzynski

Urbanization envelops an area far outside the city limits, growing to encompass a vast hinterland supplying commodities and other goods to the city. The relationship between an urban area to its hinterland is best examined through the functional markets that develop. Writing on nineteenth century Hankow, William Rowe tracked the city's inter-regional commerce through its role as a nodal center for the rice, salt and tea trades. In his classic work on the rise of Chicago, William Cronon writes of an integrated economy linking city and countryside through the timber, meat and grain markets. In both examples, the city's critical function is as an emporium for products from the hinterland, offering a ready collection of buyers and easy transportation. As supply meets demand, the markets converge and integrate. Much like Hankow and Chicago, Manila's growth in the nineteenth century engendered networks of rural suppliers and urban merchants leading to an early form of inter-regional integration and economic specialization. The timber industry provides an especially instructive case in which the market became more efficient as urban demand and rural supply developed stronger ties (Rowe 1984; Cronon 1991).

As Philippine cash crops entered the international market, the commercial economy grew and with that growth came urbanization. Manila was already a primate city by the seventeenth century because of the galleon trade, but it increased in size and importance as it became the main port for the Philippine commodity export economy (Doeppers 1971, 782–85). As the primary urban center in the Philippines, much of Manila's population was connected to the colony's commercial activity. Foreign trading houses, a significant hand-manufacturing base in the cigar industry, and shipping were centered there, not to mention the colonial government and Catholic church. Though

there are no reliable census figures, the city grew from approximately 140,000 to 250,000 residents between 1845 and 1887 (Corpuz 1997, 123–25, 144–45). The population grew as business and livelihood opportunities brought people, both foreign and indigenous, to the city, not to mention several push factors forcing people from the provinces to look for work in Manila (Doeppers 1998, 149–51). All this activity increased the demand for new construction and created a thriving urban lumber market. There was also the frequent need to rebuild and replace structures lost in fires and earthquakes, common problems in nineteenth century Manila.

Given the growth of a major city with a sophisticated export economy, one would expect the development of building cycles. Construction cycles in early twentieth century Manila have been correlated to export demand cycles, but no such study exists for earlier periods (Doeppers 1981, 44–51). There is, however, a valuable literature on the architecture and design of homes of affluent families, public buildings, and churches showing the role of timber as a building material (Zialcita and Tinio 1980; Rodriguez 1977, 34–35; Fernando 1978). In the absence of statistics and literature on urban construction over the nineteenth century, the subject must be approached from a different direction. Construction and building repair rely on materials and the provision of some important building supplies can be tracked through shipping records of the time. The present essay attempts to reconstruct the trade in construction timbers centered in Manila from the forest to the city. As such, it also provides a window through which to observe the growing economic integration of several provinces with the capital.

The Manila Timber Market

The impact of the city's expansion is evident in the records of timber entering the port. Manila was the ultimate destination for wood. According to the *Balanzas*, the annual colonial report on exports, relatively little was exported to the foreign market. Annual export figures account for no more than twenty shipments of wood to Hong Kong and Singapore—a value less than one percent of the total export trade (*Balanzas General del Comercio de las Islas Filipinas*, 1864, 1875, 1881). Timber was a commodity reflecting mainly demand in the city of Manila. Wood and timber arriving in the city supplied Manila with firewood for cooking and fueling steam engines, fine woods like narra

and baticulin for furniture and woodworking, heartier woods like molave for framing ships and houses, and yakal and ipil for construction. A quick look at the 1903 Census, the most reliable source of industrial data, reveals that Manila had eighteen furniture makers, four wood carving establishments, ten carpentry businesses, six ship builders, and fifty-seven small sawmills, including both mechanical and hand sawing of wood. These industries accounted for about twenty percent of all industrial capital deployed in the city (US Bureau of Census 1905). Certainly, timber was integral to the physical growth of Manila, an indirect expression of the benefits derived from the international cash crop trade moving through the port city.

Credit for Manila's growing demand for timber must also be given to a new design of buildings following the 1863 earthquake. The new plans relied more heavily on wood than before because it was less prone than stone to collapse during an earthquake. Fernando Zialcita and Martin Tinio, describing the evolution of Philippine architecture from 1810 to 1930, note that 1863 marked a shift from heavy stone foundations to a lighter mortar framed by wooden "stiffeners" in the walls (Zialcita and Tinio 1980, 66–67). The new design was more flexible and required more timber for building materials. The increased demand contributed to the expansion of the timber trade over the following years.

During the 1860s to the 1880s the Manila timber market matured to meet demand with supply, this is fortunate because it is exactly this same period that we have the greatest abundance of shipping records. As the market was transformed, timber merchants and shipping increasingly specialized their operations and moved the product along supply lines, and in the process converted raw timber into finished lumber. The Manila market matured as the urban suppliers became more specialized and improved their relations with actors in the hinterland. Their collective development as an industry can be traced in the shipping records of the time. Over a period of less than two decades, regular merchants began handling most cargo, ships developed regular routes concentrating on timber cargoes, relations between ship captains and merchants became more formal, and sawmills arose alongside the lumber merchants. By assessing the market situation in 1864 compared to later years, the transformation of Manila's timber market becomes apparent. Out of the data from these years, a great deal can be said about shipping, the role of timber merchants and sawmills in bringing the raw timber to the marketplace.

It should be noted that the timber trade under study here is only that recorded by shipping records. A trade did exist in supplying timber from nearby provinces overland or in rafts down nearby rivers; however, it was unofficial and only a scattering of anecdotal evidence testifies to its existence. Large sailing vessels carried the bulk of Manila's timber stock from outlying provinces, where larger numbers of logs could be extracted from the rich forests and easily transported in greater quantities. Most forests near Manila had been cleared long before, though a few spirited Filipinos brought logs down from nearby hills.

The Market in 1864

Scanning the arrival of logs in the port of Manila for the base year in Table 1, the timber-trading network appears largely informal and under-organized. Few ships arrived with a full cargo of timber. Instead, ships arrived from the provinces with partial shipments of timber along with two or three other commodities, amounting to little more than a random assortment of commodities piled onto a boat and brought into port in the hope of making a sale. With few merchants dealing in timber, captains often entered Manila without a ready buyer available or arranged for in advance. According to records on ship movements, they simply waited around for three or four weeks to sell their stock before returning home. The captain, or *arraez*, often performed the role of seller as well as supplier, a clumsy process that often resulted in ships being docked for weeks at a time selling goods right out of the boat. Building contractors and other final users often picked up and handled their own cargo. At this time the buyers, almost always Spaniards, were rarely established merchants and were more likely using the timber for their own construction projects. As a result, their names enter the record only once as a *consignado*, or the consignee accepting shipment, never to appear again. Of ninety-nine identified consignados in 1864, only fifteen or so names in the records appear to be merchants picking up multiple shipments. These were usually general merchants, but with no particular attachment to lumber.

With so many different direct buyers and so much stock waiting to be sold, the market could be described as fragmented and random. The situation changed rapidly as specialized traders began to emerge. Just eight years later a clear group of lumber merchants were exclusively engaged in the timber trade. Smaller, general merchants were already being squeezed out. The presence of Spaniards in shipping

and receiving also shrank, as native and mestizo Manila entrepreneurs emerged. In a relatively short period, less than twenty years, the market would become more specialized and better organized. In 1864, that process had only just begun.

Table 1. Partial Shipments and Cargoes Handled by Master of Ship (i.e. *al arraez*) as a Percentage of the Trade

	1864	1872	1875	1881
	<i>P e r c e n t a g e</i>			
<i>Partial Shipments</i>	76	39	37	17
<i>Handled by Master of Ship (al arraez)</i>	29	16	17	1.3

Sources: *Movimiento Marítimo* daily shipping records. *Gaceta de Manila* 1864; *El Comercio* 1872, 1875, and 1881. By 1881 the record is attenuated, so partial shipments were less likely to be listed.

To sum up the trade in our base year: a diversity of goods was being delivered and sold with timber. There was a plethora of Spanish buyers and an absence of identifiable timber-specific merchants. Trade was conducted with seemingly little predictability, and, as we shall see later, a region of production had not yet clearly emerged. It was an opportunistic pick-up trade, lacking commercial focus.

Trade Regularity

Regularization and concentration provide useful measures of the changing nature of the market. Though these are imperfect measures, the data allow two useful ways of determining the general conduct of the trade: (1) the percentage of timber shipments arriving as partial cargoes, a rough indicator of trade concentration on the supply side, and (2) the percentage of shipments labeled in the records as "*al arraez*," meaning literally "with the captain" and lacking a ready buyer at port. The declining incidence of *al arraez* entries reveals the emergence of specialized timber merchants increasing demand and an improved functioning of the market. The two sets of statistics indicate the growing coordination between supply and demand in the timber trade as a result of increasingly specialized production and the commercial effects of an increasingly well-defined group of merchants handling timber in Manila. Table 1 illustrates the transition well; the percentages

of partial shipments and cargoes handled by the ship captain declining dramatically over time.

As a cautionary, it must be conceded that the rising percentage of whole shipments in the records in the 1880s may owe much to the less careful nature of record keeping by Spanish shipping authorities or by the newspapers themselves. However, the numbers are indicative of a pattern since partial shipments still appear. The low percentage of these later partial shipments, especially the remarkable 17 percent in 1881, may be in part an "artifact of the data." Still, the general trend of change is clear, though caution must be taken in giving too much weight to the 1881 figures as official reporting grew more compact.

The haphazard assortment of trade in 1864 can be seen in Table 1: 76 percent of the timber deliveries were in the form of partial cargoes and almost three in ten lacked a ready buyer at the port and were handled commercially by the master of the vessel. Although our 1864 base year witnessed the largest number of deliveries of the four sample years (309), the majority only came as partial shipments, arriving with other commodities in the same shipment. The high supply that year may well have been a response to the 1863 Manila earthquake and the subsequent heavy demand for materials with which to rebuild. This condition was repeated in 1881 due to a series of earthquakes that rocked Manila the previous year. The trepidation and small-scale operations of suppliers and/or lack of capital in the timber trade in 1864 is obvious in the high amount of partial shipments. Judging by the similarly large number of shipments still waiting to be sold after arrival, suppliers had good reason to be cautious. Waiting a month to sell the whole supply, the demand was clearly there but the mechanisms of selling the goods were not. The pick-up market was not well organized, however rationalized it may have been for the time, and communication between buyers and sellers was fraught with difficulty due to the individual nature of the trade.

From a broader perspective, the record for 1872 may be anomalous because political strife between Tagalogs and Spaniards hindered trade that year. "The Cavite Mutiny" resulted in highly publicized trials and executions of presumed rebels. The year was marked by the repressive vigor of Spanish policy in the colony. This almost certainly dampened the business climate in Manila. The unstable and anxious state of affairs hardly lent itself to investment in new buildings. The unusually low timber supply of 1872 was likely due to such a difficult trading environment. Still, the decrease in partial and al arraez cargoes be-

tween 1864 and 1872 is notable, but considering the shipments decreased from 309 to 121, demand possibly outstripped supply and resulted in more ready buyers.

Our best record is for 1875. It shows continued progress in the timber trade, at least when that trade was relatively free of disruptive political constraints. This is also the first year in our survey to reveal specific merchants dedicated to the timber trade. Cargoes handled commercially by the captain continued to decline even as the number of cargoes increased. Furthermore, partial shipments by 1875 were more likely to include only one other commodity rather than the shipment of three or four commodities commonly found in 1864. In Mindoro, abaca was shipped alongside logs, thus generating and making good use of an increasingly frequent boat traffic. Provincial producers were already relying on their comparative advantage in shipping due to the timber trade to bolster other commerce, piggybacking commodities to fill out the cargo. In 1881, Mindoro reached a plateau in its number of shipments while the overall timber trade was expanding, illustrating their commercial focus shifting to the abaca trade and possibly a deforestation of slopes near established ports.

By 1881 the market was becoming more institutionalized on both the supply and demand side. The diminished role of partial shipments, now only 17 percent of the reported total, is in stark contrast to earlier patterns. This takes on even greater significance when one considers the enlarged flow of trade. Even more surprising is the mere 1.3 percent of shipments waiting to be sold off the deck at port, down from almost 30 percent in 1864. Comparing roughly similar numbers of timber cargoes arriving at port in 1864 and 1881, 290 and 304 shipments respectively, the large decrease in partial shipments and all arraez cargo arrangements offers convincing evidence that specialization of supply and demand proceeded apace over this span.

The introduction of purchase orders may have caused much of the decrease in partial shipments and sales "off the boat" and marked a shift from captain to a merchant-centered trade. The Spanish colonial government implemented purchase orders primarily as a bureaucratic tool for the port authority to account for and tax the movement of timber. The buyer in Manila, usually a timber merchant, filled out a purchase order for a certain amount of timber which the ship would then present at the port of loading, presumably paying the loggers then (Interview with Thomas Collins, *Report 2*: 85). The purchase order was not an advance system and did not necessarily imply a personal rela-

tionship between merchant and logger, but it did lead to greater prior organization of the timber supply. It considerably lessened the burden of selling for the logger and ship captain by paying them up front for their stock and shifting the sales responsibility to the timber merchants, some of whom, at least, were now exclusively in the business of timber supply. The purchase orders also put the provincial timber contractors in greater competition with one another to be awarded a contract.

Purchase orders may explain the development of more formal trading arrangements and the expanding presence of specialized timber merchants in later years. Whereas the 1864 market featured many buyers and poorly defined selling mechanisms, the purchase order eliminated much of the inefficiency and matched wholesale merchants with their suppliers more easily. As a result, fewer ships left port without a ready buyer for their timber cargoes, as increasingly specialized urban merchants secured their stock by ordering it long in advance.

Ship Captains

With the advance of focus in the timber market came increased specialization in shipping as well, the efficiency of transport increasing over time. Due to the better organization of trade between merchants and loggers, the movement of ships accelerated. Most timber carrying ships averaged one arrival per month in the 1870s and 1880s. In 1864, the trips were far less regular. Ship departures from Manila were not always officially reported, but the unaccounted-for sailings presumably left soon after arriving. The usual time lag in Manila was never longer than two weeks in later years, in sharp contrast with earlier time lags of three or four weeks. Doubtless the captain of later years saved on port fees, turned over his product faster, and was able to make more trips per year.

Captains were able to concentrate on more efficient shipping operations as they were freed from the burden of selling their cargo. With purchase orders in place, captains now tended to stick with one province or port instead of moving around looking for various commodities to transport. The emergence of timber merchants in Manila fostered a relation that precipitated more regular routes and concentration in shipping wood. Merchants normally had a few ships that they worked with consistently, but still used free agent shippers a few times a year. The shipping records of 1864 name the captains, revealing them all to be indigenous Filipinos operating locally made sailing vessels. Very few steam vessels ever took part in the trade. Timber, after all, is

not a perishable cargo in the usual sense that would require rapid transit.

The origins and ownership of the sailing vessels in the timber trade is difficult to determine from the records examined thus far, although a few observations can be made. Rafael Diaz Arenas, a Spanish official writing in 1838, and Robert MacMicking, an Englishman writing ten years later, concluded that the "coastal trade," that involving intra-insular movement, was conducted mainly by mestizos and Indios (Filipinos) originating in their home provinces (MacMicking 1852, 256; Diaz Arenas 1838, 24). It can be presumed certain larger merchants in Manila may have owned their own vessels; however, correlating owners with merchants is an undertaking beyond the scope of this essay. What can be said is that by the 1870s most major merchants had three or four ships they usually worked with and several "free agent" ships used periodically. More consistent was their connection to certain provinces, or even to a single port. Though some merchants may have owned their own ships, it appears more often they had a business relationship with a ship captain. Furthermore, several ships in the timber trade showed loyalty to neither merchant nor location.

Judging from the different relationships between ships, localities and merchants, there appears to be a great variety of ownership involved in the timber trade. The foreign merchants often appeared to have their own ships, while other ships seem to originate from a certain port or province, and still others were "free agents" in search of a cargo anywhere. It may even have been common in later years for the provincial logger to pay his own freight charges, provided he was paid in advance for his stock of timber (Testimony of Adolph von Bosch, *Report 2*: 113). Still, the majority of timber-carrying vessels stuck with one port and usually one merchant, although merchant-cutter contracts may blur the lines between a ship's ownership and where a merchant happens to be doing business. The general observations of MacMicking and Arenas still hold, albeit with exceptions.

Merchants and Sawmills

The role of the merchants in organizing the Manila timber trade was central to the development of a well-run market. In a fairly short time, there arose businessmen specializing in wholesale timber and wood. Hand sawing operations had existed in Manila for some time, often set up temporarily on the site of construction. However, over the period studied their number greatly expanded and mechanical mills were also

established. The timber merchants operated as the Manila-centered agents of the loggers while the sawmills provided the direct link from the merchant to the buyer. These two levels show the growing degree of sophistication in the market, and each contributed to the smooth flow of urban trade.

The make-up of those accepting shipments was a diverse spectrum as might be expected in Manila. The consignados were primarily Spanish, but there was also a substantial mix of Chinese, mestizos, and a few foreign companies. The foreign businesses often bought for their own operations only and had less connection to a captain or location while the specialized local merchants were well connected to specific areas and ships. Although the difference in ethnicity between Filipinos and Spaniards is difficult to determine owing to the similarity of names, there were definitely Chinese and possibly mestizos taking part in the trade. Records from 1864 show almost solely Spaniards participating in the trade, marked by a D. or Don preceding their names in the registers. Those names were hardly to be found in later years and the published record ceased classifying merchants as "Don." The closer bond between certain merchants and specific ships and areas would also suggest Filipino involvement, as they appear to have been more inclined to have a personal relationship with the ship captain.

More important was the merchants' connection to locations and specific logging entrepreneurs. In a sense, the merchant was the Manila representative for logging entrepreneurs in the provinces, acting as their distribution agent. Still, the relations between loggers and merchants appears to have been more institutional than personal, one merchant handling the cargoes of several different loggers. Many large merchants got wood from different ports and provinces, giving one the impression that connections between merchant and logger in later years were present but not entirely formal.

The degree of specialization of timber merchants is illustrated in Table 2, comparing merchant activity from the base year of 1864 to that in 1881. The minimal amount of concentration can be seen in the small numbers of shipments accepted by merchants in 1864. Manuel Callejas held the top spot with an impressive twenty shipments, but after him the numbers dropped off significantly. Aside from Callejas, few merchants appeared to be deeply involved in the timber trade and even fewer seemed to be exclusively timber merchants. The Baza brothers in 1864 and the Valenzuelas in 1881 may have been family businesses or just two brothers in the same trade. Through the years several

brothers and fathers and sons were listed as consignees, although it would appear from the shipping data that each had separate regional domains. The number of shipments taken by the top merchants in 1881 was far greater than in 1864. Although a gap occurred after the leader, J. Duyanding, the business was distributed somewhat evenly across a number of successful timber agents in 1881. Interestingly, Duyanding, a Chinese merchant, and Callejas, a Spaniard, appear in both years. The former receiving three shipments in 1864, the latter also taking three in 1881. Their opposing rise and fall may represent the changing nature and ethnic participation of the timber business in Manila.

Table 2. Top Six Timber Merchants, 1864 and 1881

Rank	1864 – Name and Shipments	1881 – Name and Shipments
First	Don Manuel Callejas – 20	J. Duyanding – 35
Second	Don Jose Baza – 8	P. Valenzuela – 24
Third	Don Cayetano Miguel – 8	J. Borromeo – 23
Fourth	Don Jose Rodriguez – 8	C. Valenzuela – 20
Fifth	Don Clemente Alcantara – 6	E. Jose – 16
Sixth	Don Geronimo Ramos – 6	M. Bertoluci – 15

Sources: *Movimiento Marítimo* daily shipping records. *Gaceta de Manila* 1864; *El Comercio* 1881. Names and titles written as listed in press.

A telling indicator of a lack of specialization is the number of consignados accepting freight whose names only entered the ledgers once and never reentered. The figures in Table 3 demonstrate the declining role of the single cargo consignee over time. The major merchants were becoming progressively more central. The number of shipments received by the top merchants in 1881 increased greatly, and at the same time, the total number of participants in the trade was significantly reduced. Ninety-nine people were listed as consignados in 1864, while only sixty-seven different names appear on the records of 1881, a decrease of almost one-third. A common feature of the records from 1864 was names entered once and never appearing again, meaning they were customers and not merchants. Sixty-nine such names appear on the 1864 records as against only thirty-one in 1881. Comparing the two years shows that business narrowed from a broad dispersion of buyers in 1864 to a small number of more specialized merchants in 1881. As a percentage of the whole trade, 70 percent of the 1864 consignados took only one shipment versus 46 percent in

1881. It should be noted the 1881 record marks the first time the term *orden* was used in the timber trade records, meaning that the stock was not picked up yet still ordered in advance and indicating a purchase order was in effect.

Table 3. The Total Number of Timber *Consignados* and the Number Receiving Only One Cargo, 1864 and 1881.

	1864	1881
Total Number of <i>Consignados</i>	99	67
Single Cargo Entries	69	31
Single Cargo <i>Consignados</i> as a Percentage of Whole	70	46

Sources: *Movimiento Marítimo* daily shipping records. *Gaceta de Manila* 1864; *El Comercio* 1881.

Sawmills and lumberyards were the next level along the Manila supply line, increasingly serving as the midpoint between wholesalers and buyers. The processing of logs into lumber took place in the provinces only in exceptional cases, rather, it was done primarily in Manila. The early lumberyards engaged in hand sawing wood, a process preferred because it wasted less and took less capital. The first steam-powered sawmill was in the San Miguel district of Manila from 1850–54. It was, in fact, used primarily as a rice mill, but during the off-season saw blades were attached to the engine. In 1874, the Spanish official Domingo Vidal y Soler found the bulk of the lumberyards in Tanduay, Santa Cruz, and Echague under Chinese ownership (Zialcita and Tinio 1980, 37). The first full-time mechanical sawmill in the Philippines, the *Ascerradura de Mecanica*, was opened in the 1880s by Tuason and Sampedro on Gunao Street in Quiapo, a heavily mestizo section of Manila. By the time of the 1903 census, there were said to be fourteen sawmills “recently set up” in the Philippines utilizing steam or waterpower, eight of these in Manila alone. Thirty-three small hand-sawing establishments were also reported to be in operation (*Report* 1: 283–84). Still, timber was often cut by hand at construction sites, marking a preference for hand-sawn lumber since labor was far cheaper than imported machinery and minimized up-front capital costs.

According to many contemporary reports, the ethnicity of the last nineteenth century sawmill operators was almost entirely Chinese. According to Edgar Wickberg, Chinese sawyers monopolized the trade

since the sixteenth century. They further benefited from an 1852 decree exempting the industrial tax on Chinese labor, a tactic the government designed to capitalize on their cheap labor. In 1888, Chinese sawyers created the Commercial Association of Lumber as a professional guild, signaling their importance in the field (Wickberg 1965, 109 and 179). In the 1908 *Rosenstock's Manila City Directory*, a business directory, all of the sawmills were owned either by foreign companies or Chinese and Chinese mestizos. As Thomas Collins baldly stated, "The Chinese all pretty much run the wood yards." Benito Legarda, remarking on the overall Philippine economy of the period, posited that the Chinese took over the manufacture and processing of commodities during the 1870s and 1880s (Legarda 1967, 13–14). It appears they were involved in much of the lumber processing along with foreign firms, while an array of ethnicities were involved in the rest of the supply. The ethnic Chinese were a small, but significant, percentage of merchants in the timber trade from 1864–1881, but they certainly thrived in the cutting of lumber.

Over the period marked by our samples, the Manila timber market expanded and became more structured. What began as fragmented, poorly ordered and inefficient transformed into a more coherent and organizationally efficient trade through the increased specialization of merchants, the use of purchase orders, the appearance of sawmills, and the better organization of the supply and processing industries in Manila. By the 1880s, Manila's timber commerce had greatly improved from its days as a pick-up market because supply and demand were increasingly synchronized and rationalized. All of these developments were to be expected in a growing metropolis such as Manila in the late 1800s.

The Geography of Supply

While the Manila market developed to meet the demand of its growing metropolis, the supply also became more concentrated in a specialized region of production. An increasingly organized provincial supply responded to an increasingly organized urban commerce. Over the period studied, specialization in timber extraction for the supply of Manila became more common. A specific geographical set of supply areas emerged as the Manila-centered commercial networks matured. In 1863, a law was passed permitting Europeans and Americans to live and set up business anywhere in the provinces, they had previously only been allowed in Manila, Iloilo and Sual (Corpuz 1997, 153). This measure allowed the arrival of foreign entrepreneurial log-

gers with Manila contacts to the forests. These commercial loggers concentrated in an area offering abundant, accessible forestland along established timber shipping routes. They then expanded their operations further to nearby islands, creating a zone of timber production south of Manila in hilly coastal areas along Tayabas Bay and the Sibuyan Sea. These foreign loggers were spurred on by the growth of Manila and entered the provinces as representatives of the Manila market. Some others doubtless supplied Iloilo as well, however, the main trade was in Manila.

Early logging endeavors moved small numbers of logs slowly and arduously. Writing in 1846, Jean Mallat describes a scene in Nueva Ecija where woodcutters tied a few logs onto a bamboo raft, or crafted a raft out of the squared timbers themselves, and sailed them down the Pampanga River to Manila in a trip lasting anywhere from twenty days to two months. Appropriate technology perhaps, but not a model of efficiency. Mallat estimated only a third of the wood cut ever actually reached its intended market. Many trunks lay discarded on the forest floor, too heavy for the teams of carabao to drag to a port on the shore (Zialcita and Tinio 1980, 34). Such a trade still existed during the period studied, but the supply from overland or riverine routes was smaller than the sea-borne trade owing to the smaller capacity and greater difficulty of transport.

The methods of cutting and land transportation remained largely unchanged until the arrival of American machinery in the twentieth century, but shippers and loggers still made it possible to deliver larger quantities of wood in a relatively short time. Cargoes consisting of only a few logs from nearby areas traveled for weeks, while ships from Masbate or Tayabas often came in three days time carrying three hundred logs. Sea transport involved a minimal transport downstream or downhill to a nearby provincial port where a ship could take hundreds of logs to Manila in an efficient manner. Ease of transport was key. All of the major logging areas offered hill slopes or nearby rivers to facilitate the movement of great logs to the shoreline. In a time before railways and steam mechanization, rivers and hills next to the coast were the comparative advantages of the timber hinterland.

The data from our sample years bear out the growing pattern of regional specialization. The logic of the marketplace changed as shipping and logging concentrated in a specific region and expanded. Trade followed the entrepreneurs who moved to large tracts of available forestland and away from the provinces where logging was al-

ready supplanted by cash cropping, in which case the land had already been deforested. Accessibility was key; although land clearing for crops and livestock was taking place, these logging entrepreneurs took advantage of the ample natural capital, the standing rain forest, of several isolated provinces and extracted large numbers of logs at great profit. In the process of specialization, supply channels became more efficient, logging grew as an increasingly coherent set of activities, and more timber was brought to Manila.

The Supply Market

Figures for the Manila timber arrivals in 1864 show a supply region scattered across the archipelago with only the major producing provinces—Mindoro and Southern Tayabas—appearing to be commercially specialized in timber extraction. As mentioned earlier, the pick-up market in Manila led to ships stopping at random ports and picking up a variety of commodities along with timber. With shipping and receiving lacking regularity, the overall timber supply resembled less an organized industry than a secondary trade accompanying the commerce of other available commodities. The ban on foreigners had only recently been lifted in the provinces, so it can be assumed the market in 1864 is representative of an older, desultory logging industry. Table 4 gives a picture of the 1864 supply zone and provides a comparison with later years.

Several observations can be derived from table 4, and will be dealt with separately. Tayabas (present day Quezon) and Mindoro were consistently top suppliers, with Southern Tayabas increasingly the predominant source while the latter remained stable. Viewing the data from 1864 to 1881, a pattern of regional concentration around the Sibuyan Sea-Tayabas Bay area emerges. Smaller islands in the same area like the Romblon group and Marinduque also rose to prominence, possibly because loggers saw nearby opportunity after exhausting one area. Zambales, Batangas, and Masbate fell off in numbers of shipments, possibly because earlier land-clearing efforts depleted the more available timber. Finally, the principal provinces participating in the timber trade were generally poor areas with few connections to the export agriculture boom. The data focus more on number of shipments than on size of shipments because of the inconsistent reporting on cargo size, especially in later years, though Table 1 indicates more full shipments were arriving during later years. Shipments in later years were more likely full shipments than those in earlier years.

Table 4. The Six Leading Provinces Sending Timber to Manila: 1864, 1872, 1875, and 1881

1864	1872	1875	1881
290 Shipments 15 Provinces	120 Shipments 8 Provinces	206 Shipments 9 Provinces	304 Shipments 13 Provinces
Tayabas - 84	Tayabas - 65	Tayabas - 84	Tayabas - 113
Mindoro - 57	Mindoro - 28	Mindoro - 61	Mindoro - 68
Masbate - 41	Marinduque - 12	Romblon - 17	Romblon - 27
Romblon - 35	Batangas - 8	Marinduque - 14	Marinduque - 25
Zambales - 29	Zambales - 3	Masbate - 11	Masbate - 20
Batangas - 14	Masbate - 2	Bataan - 7	Zambales - 16

Sources: *Movimiento Marítimo* daily shipping records. *Gaceta de Manila* 1864; *El Comercio* 1872, 1875, and 1881.

Note: Full cargoes and partial shipments are being treated equally here.

From just this data, the composition of the 1864 market appears to mark the end of an earlier supply pattern. Suppliers from as far away as the southern island of Panay were sending shipments of timber to Manila, but as Iloilo rose to commercial prominence that trade likely reverted to the closer urban center. Nearer to Manila were Batangas and Zambales, two provinces whose production decreased substantially in later years. Both were likely to have eventually found more profits in the commodity export market and in provisioning Manila and less interest from logging, as well as an increasing dearth of accessible trees.

The two major timber-producing provinces—Tayabas and Mindoro—were the leading suppliers throughout. While provinces like Zambales and Masbate were clearing for grazing land, the west coast of southern Tayabas and Mindoro were specialized in timber production as a primary industry. The reason for their pre-eminence early was the same as it was later—abundant forest, available labor with few other opportunities, relative accessibility of forested hills to local ports and proximity to Manila. It was several years before the rest of

the region would fully be incorporated into the trade, though Romblon's early presence hints that the process had already begun. The earlier timber region included areas of intense extraction that later were the heart of the trade; however, the geographical area of supply in 1864 was widely dispersed and not yet entirely specialized. As logging operations expanded and became a major part of provincial commerce, Manila's timber hinterland became more focused.

Table 1 is also a good indicator of the scattered nature of the trade in 1864. Because of the many partial shipments, a full 76 percent of cargoes arrived with other commodities on board. The prevalence of ships with partial cargoes was symptomatic of poor organization in both the Manila market and along the supply lines. Much pressure appeared to be on the ship captains to sell their own merchandise, as 29 percent of arrivals had to wait for buyers to take their freight. By the 1870s, timber merchants functioned essentially as agents of the loggers and took care of the cargo. The lack of such agents in 1864 appears to have affected the supply side by inhibiting specialization and trade relations with Manila.

Changes in the timber market in later years are illustrated in Table 4, which indicates the emerging regionalization of supply around the Tayabas Bay-Sibuyan Sea area. Trade there radiated from the Big Two—Tayabas and Mindoro—to the rest of the area and expanded. As urban growth and prosperity brought more loggers and shipping to the area increased in regularity, nearby islands and provinces were brought into the commercial orbit of Manila and benefited as timber suppliers. The inclusion of islands between the Big Two is an outstanding characteristic. These included Marinduque and Romblon. Logging entrepreneurs looking to carve out their own niche in the timber supply would have found much available forestland not far from the major shipping routes and without much local competition.

Being outside the trade in cash crops worked in the region's favor as a timber producer due to the absence of large settlements and alternative employment. All these provinces offered much available forest area and little other economic activity to attract workers away from logging (Wernstedt and Spencer 1976, 421–27, 428–30, 451–54). Spanish law at the time permitted cutting anywhere on public lands provided one held the proper provincial logging license. The more "unowned" the land, the better for loggers since they were free to move wherever there was available forest to cut without needing permission from a landholder. The lumberjacks themselves were usually

nothing more than local subsistence farmers requiring only a small advance to relocate their family to wherever trees were to be cut. Considering the poverty of the area, even these meager wages were attractive considering the colonial head tax, the *cedula*, required cash payment. Loggers moved into areas largely unchanged by the cash crop-led economic boom of the 1870s and brought a wage system bearing an oblique connection to Manila's prosperity, bringing the laborers into a share of Manila's growing economy.

The Supply Region

The supply region took shape around a noticeable maritime region bordering the Sibuyan Sea, the land clearing in Zambales providing a notable exception. The major producers, Tayabas and Mindoro, each deserve separate mention, and then a more general picture of timber-producing areas can be drawn. Tayabas and Mindoro had the common characteristics of a large forested area with major logging operations; however, each went about the timber industry differently. They were relatively poor and underdeveloped compared to the agriculturally developed provinces with cash crop cultivation, such as Iloilo or even northern Tayabas, and all offered the sloping topography and nearby waterways essential to transport. As such, they contributed to the Manila economy and became a part of early commercial integration through timber.

The southern coastal ports of Tayabas, comprised the most timber-focused of all regions. The more prosperous and populous northern part of the province focused on coconuts and rice, the southern part on timber. The annual leader in wood shipments, timber was the sole commodity commerce of the southern part of the province. Most likely the intense timber cutting was due to Tayabas' proximity to Manila, ease of extraction to ports, and relatively larger workforce than other provinces in the timber region, making it an easier area to exploit than a more isolated place like Masbate. Diaz Arenas (1979, 24) mentions the National Treasury owned a sawmill in Tayabas contracted to supply timber to the shipyards of Cavite in the 1840s. The government contract likely contributed to the improvement of ports and shipping in the province, although it is unclear whether it was capitalizing on an extant trade and using local contractors.

Whatever the case may be, during this period the timber market in Tayabas was very well developed. In 1900, Thomas Collins mentioned that "they cut the wood and it goes through two or three hands" in

Tayabas, unlike other areas (Interview with Thomas Collins, *Report 2: 82*). The more intricately layered market there was due to the concentration on timber in southern Tayabas, resulting in a supply market within a supply market. Tayabas was also one of the first provincial areas to have a successful mechanical sawmill. The Laguimanoc Saw Mills and Timber Company, in the present-day town of Padre Burgos, was run by an Englishman named H.B. Brown from 1889–1891. The mill closed three years after he sold it to a Hong Kong consortium. Although the consortium attributed their failure to a variety of human and animal diseases, it was accepted among woodcutters that the area had simply run short of valuable timber (Interview with Adolph von Bosch, *Report 2:111*). Such an early example of deforestation would not have been uncommon, but the sawmill lacked the mobility crucial to the success of smaller logging operations. Additionally, the sawn timber was overpriced because of the difficulty and expense of on-site processing.

While loggers in southern Tayabas exploited its forests, similar activities in Mindoro were less intensive due to a small-scale cash crop agriculture that provided some economic alternative. The fringes of the island had long been threatened by Moro slaving raids in the Sibuyan Sea, and remained underpopulated and underdeveloped despite government efforts to bring settlers to farm the area. Calapan and Puerto Galera were already common stopover ports for Manila-bound ships from the south, the latter especially as a port of call in stormy weather, giving loggers a ready mode of transportation for timber from Mindoro's dense forests. Some commercial agriculture took hold in the 1880s, mainly hemp and a few other cash crops (Schult 1991, 30–32). Deforestation near the ports may account for the flagging number of shipments between 1864 and 1881. Nonetheless, throughout the entire period, Mindoro remained a solid number two timber supplier behind Tayabas and was one of the few islands to offer a unique type of wood. Having cedar trees was rare for a tropical forest, and Mindoro cedar was in special demand for making cigar boxes.

By contrast to the leading producers, the timber industry in Masbate and Zambales coincided with the clearing of land for cattle grazing. While cutting timber required carefully extracting the valuable woods from the forest, logging in these two provinces was more focused on clearing land. Thus, they were also leading suppliers of firewood, a less exacting wood to cut, throughout the period. Before cattle were established in Masbate, ranchers in Zambales had already been

engaging in large-scale land-clearing to make room for cattle, as can be inferred from its flagging number of timber shipments. It is likely the decreasing number of shipments is indicative of deforestation, indicating the ranchers were successful in their endeavor. The involvement of Masbate and Zambales in the timber trade is thus different from many other provinces in that the land was being converted from forest to pasture, while logging operations in other areas tended to select valuable woods to cut while leaving the land with an open canopy, semi-forested.

The other provinces involved in the trade bear also offered ample forestland with a cheap workforce. Such a description would describe most places in the Philippines untouched by the cash crop boom, the main difference being the nearby shipping routes. Islands like tiny Romblon, Marinduque, and Tablas were included due to their similar characteristics—hilly forests, access to small ports, proximity to Manila and to other areas where commercial loggers were active. Having cut away all the accessible valuable timber in one island or watershed, loggers could easily move to a nearby island with similar characteristics. Marinduque rose from nothing in 1864 to place fourth in shipments in 1881, no doubt affected by the loggers flooding the region. All the areas within the supply region were similarly isolated and well endowed with nature's capital, offering loggers much available forest. A ready source of transportation was also always present with each island having at least one good port near the forested areas. The general location, being south of Luzon, also benefited by being outside the worst of the typhoon zone, meaning that timber could reach Manila during the Southwest monsoon. The northern areas like Zambales and Pangasinan would have been nearly shut down during most of July and October, making them a far less reliable source of wood throughout the year.

Logging Operations

The logic of timber cutting in the Philippines is best examined through the entrepreneurs who started the provincial logging operations. Certainly some Spanish and a few indigenous businessmen had long been involved in timber, but the arrival of the foreign loggers, acting on the evident demand in Manila, appears to have been the catalyst for the expansion of specialization of the trade. The small-scale informal trade was dominated by indigenous cutters. In Tayabas, it was not uncommon for them to sell a log directly to a timber merchant

at the port. Yet the most critical actors in the initial change of the market were the European and American timber-cutters and the industry took on a new shape under their direction.

Starting a timber-cutting business was a simple process requiring more moxy than money. The timber license could be purchased cheaply for a year from the Inspector of Mountains' office. It allowed a cutter free reign on all forests on public lands in certain provinces. The main bureaucratic complication lay in transport, where officials charged a duty per cubic foot at the port of departure. The trade was closely monitored by the government, primarily because of the substantial duties collected, so smuggling was not simple due to the close official supervision of port traffic.

The logger organized local men into a work gang, paying only for the building of new settlements and giving the workers a slight advance on their labor. At times, Tagalog workers were brought in, resulting in an early form of transmigration moving whole families to a new community (*Report 3*: 287). The wages paid were low, but considering these were subsistence farmers, the pay was sufficient to attract a small workforce. A system of indebtedness developed similar to peasant laborers elsewhere in the Philippines. The laborers received an advance for their work and were then paid *per vara* for the number of trees cut and brought to port. They often accrued debts buying goods for their family through their employers; most entrepreneurs wrote off a certain amount of loss to further debt-induced advances. Whole families often worked in the felling of trees, even if only the man of the house was "employed." Ironically, the locals made more money daily by hiring their carabao to the foreign logger than they did by working themselves (Testimony of Thomas Collins, *Report 2*: 79–92). Without carabaos, there could be no logging. It often took many carabaos to drag a single log. Although the presence of carabaos would suggest there was heavy agriculture in the logging provinces, it is more likely that these animals were widespread before the rinderpest epidemic of 1886–1888 and were indigenous to the area. The absence of any seasonality to the timber trade, in spite of Manila's construction cycles, also casts doubt on the cutters being otherwise employed as farmers.

The style of felling trees, undertaken by indigenous Filipino labor, remained relatively unchanged over time. Thomas Collins, an American logging contractor in Tablas, Romblon, described it:

They cut with axes always. They commence cutting one way, the way they want the tree to fall; they then cut on the other side, and then return and cut from the back and get it to fall where they want it. After that the timber is squared. They put a nose on the log and round it up, and hitch these carabaos on it. (*Report 2*: 82)

Squaring the log—cutting the trunk into a flat shape on four sides—was the extent of wood processing on site, and that was mostly to ease the movement of dragging the log to a nearby boat. Though Manila records referred to the timber in terms of *trozos*, or trunks, the logs were, in fact, usually squared timbers. Land transportation of logs was extremely difficult owing to the unmechanized nature of Philippine logging, steam engines were first used only in the twentieth century. Reports mention up to 100 carabaos pulling a single log. Almost all cutting was done near a body of water so that the logs could be floated on a raft to a vessel at the nearest port. The forest was ample enough so that it suited the industry best to be mobile rather than too intensive in one area. Such logging was based more on going into the forest and taking out a few valuable logs than it was on clearing the land, leading less to total deforestation than depletion of certain valuable woods and damaging much of the nearby forest in the felling and dragging of such large trees. This method left a broken open canopy woods behind—depleted of commercially valuable species.

Profits in logging ran high. The profit motive inspired foreigners to move to isolated islands like Burias and Ticao to set up a logging operation. The wages of the cutters were a small cost of business, and selling goods to their workers actually became a profitable side venture for most loggers. Though prices are difficult to find for most of the period, testimonial evidence implies that a handsome profit could be made in the Manila market (Testimony of Adolph von Bosch, *Report 2*: 112–13). H.B. Brown's aforementioned sawmill sold 6000 shares of stock for a total value of \$300,000; it averaged 8.3 percent annual dividends for three years (Foreman 1899, 368–72).

Hong Kong, Singapore, and Shanghai were occasional destinations for Philippine timber, but took relatively small amounts compared to the Manila trade. A common problem cited in the Chinese markets was strong timber-cutting unions fixing prices and sometimes high taxes (Testimony of Thomas Collins, *Report 2*: 84–85). It was only a fraction, numbering perhaps ten shipments a year, of the larger domestic trade. The market in China was opportunistic, resembling the 1864

Manila market with ships just sailing in and selling right off the deck. The lumber contractor bypassed the Manila timber broker, often shipping goods straight to China without intermediaries; however, the comparatively small-scale activity indicates Manila was the more dependable market. It should be noted that large American logging companies from the Pacific Northwest ran into similar problems in China, giving it some notoriety as a difficult market (Cox 1974, 82-91). China, like most countries near the Philippines, had its own domestic logging industries and was not very dependent on foreign timber.

Manila merchants, the key to organizing the market in the city, provided a ready market as agents for the logger's goods. Loggers typically had a connection with at least one agent who acted as a market liaison, a development benefiting both merchant and logger (Testimony of Adolph von Bosch, *Report* 2:114). The personal connections between merchants and loggers doubtless facilitated the use of purchase orders and created much smoother movement along the supply chain. Such a connection was lacking in the foreign trade, so loggers were more likely to take the up-front payment rather than risk it in the more unpredictable foreign market. Price records were not routinely reported until 1896, so it is difficult to determine what role that played. However, all things being equal, the Manila market was a much safer destination for the provincial loggers to ship their freight. Though price may have been an important, albeit unquantifiable factor, the decision-making of provincial logging entrepreneurs hinged on risk-assessment. The many pitfalls and obstacles in the overseas market made Manila a more attractive option by comparison.

Timber thus represents a case where domestic trade was preferred over export due to the stronger economic integration of the supply and demand markets. The timber trade involved many provinces otherwise ignored by the export agriculture market and integrated them with the Manila's growing economy. Previously marginal provinces became an important part of Manila's economy and contributed much to its growth as a major metropolis. These provinces did not experience a social and economic revolution because of logging, but what did arrive with the timber industry was a system of wage labor and a modest improvement of local ports. This was a form of early market integration for these provinces that was an essential part of the development of Manila and much of the Philippines as well.

Conclusion

The growth of Manila necessitated a reliable supply of building materials, drawing in isolated provinces with large areas of accessible forestland to the economy of the metropolis. The market began as scattered, slow, and inchoate. Logging operations, shipping, and merchant activity were poorly ordered. Within the period under survey, an organized and increasingly regularized supply emerged, in response to the greater Manila demand for lumber. Merchants, ship captains, sawmill operators and logging entrepreneurs achieved a greater efficiency of trade through specialization. A trading region developed, captains and loggers were paid up front for their merchandise, merchants began handling timber, and sawmill establishments started up.

This commerce also resulted in substantial environmental modification, as trees were converted into cash. Dense forests were converted to pasture in Zambales and Masbate and fields of abaca in Mindoro, Marinduque, and Romblon. Even areas not entirely cleared were still scarred by the felling of such large trees, leaving the forest depleted and littered with broken trunks and crushed saplings from falling trees. The destruction of habitat set various endemic species of bats, birds and other forest creatures on the road to extinction. The loggers' mobile style of exhausting the accessible resources in one area and moving along to another contributed greatly to the transformation of the landscape, leaving a scarred or denuded coastal forest in their wake.

The Manila timber trade transformed both economics and ecology. Though not as profound a change as that enacted by later large-scale logging operations, the start of commercial logging in the Philippines integrated the provincial supply with Manila demand, optimized the delivery of timber in the city, and began the process of ecological change from deforestation. The growth of Manila as a city had far-reaching effects in the provinces that came to be involved in the timber trade. The city's demand fueled a large part of these provincial commercial economies. The data from shipping records give an impression of urbanization in Manila. Equally, however, they represent the extent to which economic and ecological change affected provinces far outside the city.

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