

Locally produced textiles on the Indian Ocean periphery 1500-1850: East Africa, the Middle East, and Southeast Asia

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Ravi Palat and Immanuel Wallerstein claim that India 'deindustrialised' its Indian Ocean periphery, by exploiting its advanced proto-industrial techniques, especially for the production of cloth. (Pearson 1998: 109-12, 121, 126) After 1500, the picture was complicated by the violent irruption of Europeans, and yet they failed to dislodge South Asian cloth from its hegemonic position. All scholars agree on the continued market penetration of Indian cottons and silks in early modern times, although statistics hardly exist, and publications are patchy over the thousands of kilometres that separated Luzon from Arakan, and Mozambique from the Red Sea and the Persian Gulf.

There is a real problem in determining what the performance of peripheral textiles might have been without imports from India. (Pearson 1998: 121-2) Anthony Reid postulates a 'zero-sum game,' whereby local output fell when Indian cottons surged in, but increased when imports from India were curtailed for some exogenous reason. (Reid 1988: 96) The evidence put forward in this paper does not bear out this mechanistic model. In reality, imports from India were as much a stimulus as a threat to local industries.

Complicating matters was a marked blurring of the traditional distinction between 'manufactured imports' and 'local raw materials', given that imported textiles could serve as intermediate goods. Local artisans decorated coloured cloth from abroad, printed and dyed imports of plain white cloth, and wove yarn that had been spun far away. Indeed, they even unpicked finished cloth to obtain the dyed yarn that they desired.

To further complicate matters, 'local' cloths sold over quite wide areas. Although peripheral textiles never became truly global commodities like those of India and China, the ability of some to transcend local contexts was a clear demonstration of proto-industrial vitality. A few of these products reached the Atlantic world, although a more consistently important outlet was probably the Hijaz. Pilgrims from all over Islamdom exchanged their cloths with fellow pilgrims, or sold it to Meccan merchants, whereas the holy city itself was almost devoid of manufacturing. (Issawi 1966: 302-3)

The role of early modern states was ambivalent. Europeans, representing monarchs or chartered companies, exercised a precarious overall naval hegemony in the Indian Ocean from 1500, but their attempts to favour sales of their own cloth failed dismally. They then faced the same predicament as indigenous rulers, whether to protect and tax local artisans, or benefit from lucrative import duties on Indian and Chinese products. Unlike local rulers, European thalassocracies further stood to benefit from transporting Indian and Chinese textiles.

General characteristics of peripheral textiles

Cotton predominated as a raw material, but other fibres were of great significance. Artisans produced silk goods for the higher end of the market, sometimes drawing on wild insects. Bast, vegetable fibres that did not require spinning, came from flax [for linen], hemp, different kinds of palm [e.g. raffia] and banana [e.g. abacá], ramie, the bark of some trees, and newly introduced American pineapple and sisal plants. Kapok was used for quilting. Bark cloth, felted rather than woven, was common in forested zones from the South Pacific to Central Africa. Where pastoralism flourished, sheep, goats, camels, and yaks supplied hair, which could be either spun and woven, or felted. In addition, hides, skins

and furs at times substituted for cloth. (Picton and Mack 1989; Schaedler 1987; Lombard 1978; Baker 1995; Fraser-Lu 1988; Hitchcock 1991)

Indigo was grown in many places, and typically supplied the blues and blacks of the Indian Ocean world. Almost priceless saffron, or cheaper safflower and turmeric root, yielded yellows. Reds came from *coccus* insects, precious woods such as sappan and brazil, or roots such as madder. Dyestuffs and mordants were widely traded. (Baker 1995: 29-31; Hitchcock 1991: 42-51)

Islam tended to imprint certain characteristics on textiles of the Indian Ocean periphery, for the sector was largely in Muslim hands. Pious Muslims disapproved of luxury, and particularly frowned upon silk, which a Hadith reserved for the hereafter. That said, Shi'i and Isma'ili ulama were more tolerant than their Sunni counterparts, and political elites frequently ignored religious strictures. Another Hadith exempted cloth from the overall prohibition on representing living beings, and yet there remained a persistent iconoclastic bias against figuration. White was often preferred for men, and green for descendants of the Prophet, whereas dark blue and black served for women. Special colours were also at times imposed to distinguish unbelievers living in Muslim societies. (Baker 1995: 16-17, 62, 68; Otavsky et al. 1995: 24; Lamm 1937: 229, 242; Maxwell 1990: 328-9) Non-Muslim societies had their own preferences and cultural codes, as in Madagascar and Mainland Southeast Asia. (Mack 1989: 43-4; Fraser-Lu 1988)

Southeast Asian textiles

Anthony Reid states that Southeast Asia was a consumer rather than a producer of textiles, but then almost immediately writes that 'cloth was Southeast Asia's leading item of manufacture.' Local cloth occasionally acted as currency, and was often paid as tax. Cotton was widely grown and processed in drier areas, on either side of the

equatorial belt, whereas silk was more developed in Mainland areas. (Reid 1988: 90-3) In the eastern archipelago, bark cloth remained significant, connecting with the traditions of the South Pacific. (Andaya 1989: 29-30)

An early and widespread technique for decorating cloth was ikat, whereby lengths of yarn were dyed in different colours by tying and covering yarn to resist dyes prior to weaving. Ikat was recorded in 939 CE in Java, and has been dated from the fourteenth century in archaeological sites in the Philippines. (Hitchcock 1991: 73-83)

More controversial are the origins of batik, a system of dyeing cloth in stages, with wax used to resist dyes. This technique, found in various locations around the world, has been dated back to the sixth century CE in East Asia. It may already have been practised in Java by the tenth or twelfth century, and was possibly first mentioned in a text of 1518. In any event, most scholars agree that batik was produced in Java by the early seventeenth century. The finest kind was drawn by hand, but wooden blocks, on the Indian model, were also used. (Kerlogue 2004: 17-18, 20-1; Hitchcock 1991: 23, 86-9, 94, 127; Matsuo 1970: 77; Maxwell 1990: 327-9)

Java, Madura and Bali certainly produced a great deal of cloth, reflecting the size of their population and the abundance of raw cotton. Tomé Pires was impressed by the sheer quantities of cotton cloth produced all around Java in the 1510s, albeit not so much by its quality. (Pires 1944: 169-70, 180) From the 1680s to the early nineteenth century, there was a rapid increase in the output of woven cotton and batik. (Andaya 1989: 40) Peter Boomgaard professes himself astonished by Dutch statistics from 1808, indicating a loom for every 2.5 households in Surabaya and Gresik, and suggests setting them aside as 'extreme values.' However, his own survey shows that parts of Java were indeed highly specialised in textile production for the market. (Boomgaard 1989: 126-9)

Weaving cotton cloth in Sumatra went back to long before the arrival of the Portuguese, and silk was produced in the north. (Hitchcock 1991: 29, 32; Kerlogue 2004: 19; Hall 1996:117). From Tomé Pires' description of the 1510s, it seems that cotton cloth was mainly woven in the uplands, where cotton grew, and was sent down to the coast. (Pires 1944: 148) In the south, a local boom in weaving developed in the eighteenth century. Upland farmers switched from pepper to cotton, and maintained their own lively textile traditions. The sultanate of Palembang, more stable and prosperous, benefited more than that of Jambi. (Andaya 1989: 39-45) The batik technique also spread to South Sumatra at this time. (Kerlogue 2004: 20-1; Kerlogue 1994) In 1832, spinning, weaving, dyeing and 'batikking' were widespread skills, together with the weaving of silk and gold thread. (Andaya 1989: 45)

Although southeast Sumatra was especially famous for its finely wrought cloths, other parts of the island participated in this boom, as indicated in John Anderson's detailed survey of 1823. Aceh, in the north, produced both silks and cottons. In east Sumatra, 'great quantities' were produced, both the fine cottons and silks of coastal Muslim Malays, and the modest but tough homespun cottons of Animist Batak in the interior, the main cultivators of raw cotton. Of the latter it was said: 'The texture is extremely coarse, and the cloth harsh and wiry to the touch.' Fabrics were dyed blue with locally grown indigo, while woods supplied reds and other colours. (Anderson 1971: 206, 247, 264, 304, 312-15, 327-8, 415-17) In West Sumatra, weaving was concentrated in the highlands, with raw cotton from the coastal strip. (Dobbin 1977: 18-19; Oki 1979: 148)

South Sulawesi's cotton weaving was concentrated in the southernmost tip of the peninsula, and in the neighbouring island of Selayar. These stuffs were characterised by a 'fine consistent weave, and clear colours - mainly in the checked pattern favoured by Muslims.' (Reid 1988: 95) Selayar 'mass produced' cheap checked cottons for *sarung*, but also striped varieties for trousers. Fine weaves were reserved for

nobles, who by custom wore only local cloth. (Heersink 1999: 49-50)
Weaving was a major source of income for local families by 1785, with red and blue checks prominent. Although cotton was the most important fibre, silk and palm fibres also figured. (Pelras 1996: 241-2, 245)
Numerous migrants, from South and Southeast Sulawesi, diffused the area's techniques around the archipelago. (Heersink 1999: 49-50; Maznah 1996: 88)

The Philippines had a lively weaving tradition, noted in the first Spanish documents. Panay had the highest reputation for its diaphanous materials woven from pineapple fibres, known as *piña* or *nipi*. This cloth was also famous for its designs and bright and varied colours, and almost every family in the province of Iloilo had a loom by the early nineteenth century. (McCoy 1982: 301-3; Mallat 1983: 190, 195-6) Also entering into Philippines textiles, often in complex mixtures, were cotton, silk, and *abacá*, the latter a kind of banana confusingly called Manila hemp. Ilocos was the chief centre of cotton cloth production, with an estimated 20,000 looms in the early nineteenth century. Camarines and the area round Manila wove fine fabrics, with much silk and pineapple fibre, and Manila embroidery was another speciality. (Mallat 1983: 87, 119, 125, 143, 174, 176-9, 187-9, 195-8, 201-2, 458-9)

Pious Theravada Buddhists, from Burma to Cambodia, denounced making silk because it involved taking life, but such strictures were often ignored, and Chinese raw silk was easy to procure. Cotton was important, but it generally supplied the lower end of the market. Hemp, perhaps the oldest fibre of the region, was giving way to expanding cotton cultivation, and was increasingly confined to Animist areas in the mountains bordering China. (Fraser-Lu 1988: 84-137; Pires 1944: 99, 108; Lieberman 2003: 144-5; Fraser-Lu 1994: 267-8, 252; Ingram 1955: 114-18) The Cham minority of Cambodia and Vietnam, Austronesian-speaking and largely Muslim by faith, was unusual in its stress on cotton,

adopting ikat and batik from its Malay cousins. (Green 2003: 200-1, 206; Hitchcock 1991: 97; Maznah 1996: 89)

Vietnam was closely linked to China by the religious synthesis between Confucianism, Mahayana Buddhism and Daoism, and it concentrated the most on silk in southeast Asia. (; Hall 1996: 117; Pires 1944: 115) However, very fine cotton cloths were produced alongside silk in Tonkin. (Nguyen 1965: 166-8, 173-4) Early modern Vietnamese people perceived dressing in cotton as a sign of low status, but some villages specialised in weaving cotton and paid their taxes in this form. (Li and Reid: 100, 121-4; Nguyen 1965: 167) Animists of the central uplands, deeply influenced by the former Cham empire, may have been those most wedded to cotton cloth. (Li 1998: 122)

Middle Eastern textiles

The Middle East had an ancient textile industry based on silk, wool, and linen, with cotton the most recent arrival among the major fibres, and with Persia as the foremost producer. (Lombard 1978; Otavsky et al. 1995; Lamm 1937) The new Safavid dynasty built on a venerable tradition of weaving fine silks, and disposed of a technology similar to that of Europe in the late seventeenth century. (Ferrier 1996: 173; Spuhler 1986) The cotton industry was initially on a smaller scale, overshadowed by imports from India. (Pires 1944: 29-30) By the late seventeenth century, Persia produced much cheap cotton cloth, but it still could not rival fine Indian cottons. (Ferrier 1996: 174-5) Coarse stuffs were traditionally employed for tents and 'middle class' clothing, but there were indications of better quality cloth, including prints, being made in the eighteenth century, notably in Isfahan, Yazd and Kirman. (Issawi 1971: 262-81)

Iraq had the misfortune of being fought over repeatedly by Persians and Turks from the sixteenth century, dimming the textile glories of the

Abbasid Caliphate. A gloomy French report from the 1780s opined that 'a few woollen manufactures' in Baghdad was all that remained, and that imports from Persia, India and Europe dominated the market. In reality, Baghdad, Basra, Mosul and Kirkuk retained small silk, cotton and woollen industries, and some rural linen production survived. (Issawi 1966: 43, 50, 136, 180-1; Issawi 1988: 181-2, 395-6, 400-1) However, Mosul, which had given the world the name 'muslins,' was a mere shadow of its former self. (Khouri 1997: 33-7; Shields 2000: 76-8, 99; Lombard 1978: 64)

Silks and woollens were initially to the fore in the Ottoman empire, but cottons grew rapidly from the seventeenth century, beginning close to existing centres in Syria. The Diyarbakir region of Southeastern Anatolia was prominent, specialising in red cloths modelled on Indian fashions. (Baker 1995: 160; Issawi 1966: 33) As for Cyprus, it printed calicoes to cover divans. (Issawi 1966: 44) Bursa, the old Ottoman capital, initially focused almost exclusively on silk, but developed the printing of cottons after 1600. Istanbul also became known for its prints. (Baker 1995: 160) The rise of cotton textiles in the Ottoman Balkans came in the eighteenth century, supplementing existing woollens. (Crampton 1987: 10-11; Castellan and Todorov 1976: 19; Jones 1981: 189-91; Issawi 1966: 43-4, 48-9)

Greater Syria, incorporated into the Ottoman empire in 1516, had the best established cotton weaving sector in the Middle East, based on local cultivation of cotton. The area also produced exquisite silks, and cloth of gold. (Lamm 1937: 226-34) In 1838, a British consul noted that 'Aleppo was famous throughout the East for her woven goods.' The city which had once boasted 40,000 looms still had some 4,000, mainly for silks, high grade cottons and 'low muslins, used for printing on.' Damascus rivalled with Aleppo. (Issawi 1966: 41-3, 221-4)

Initially, wool dominated Upper Egypt, and linen Lower Egypt, together with some transformation of imported silk. The country grew little cotton, importing the necessary materials from Syria and India for the

white cotton robes that men wore in summer. (Otavsky et al. 1995: 22; Lamm 1937: 230, 241-3) However, Ottoman domination from 1517 coincided with an expansion of cotton. (Baker 1995: 14, 36-8, 66-79) By 1798, the balance between growing linen and cotton had shifted in favour of the latter, especially in the eastern delta. (Raymond 1973-74: I, 182, 229-31; Lombard 1978: 49) Cotton was in its infancy in the Sudan prior to the nineteenth century, with only 'a kind of light cotton cloth made at Dongola.' (Lamm 1937: 239-40; Issawi 1966: 479, 484)

Cotton grew well and precociously in Yemen, which came under tenuous Ottoman suzerainty from 1517, and there was a tradition of ikat dyeing of yarn since the ninth century CE. (Otavsky et al. 1995: 22, 26; Lamm 1937: 234-7; Baldry 1982: 21-2; Baker 1995: 60-1, 76). Cotton cloth production was concentrated in the coastal plain of the Red Sea, whereas woollens were manufactured on the plateau. The elite liked Indian muslins and silks, but medium and coarse local cotton fabric, in part dyed with locally grown indigo, served to clothe the lower orders. Jews could wear only blue, and Hindus and Jains were once ordered to dress exclusively in red, a command annulled after suitable payment. (Baldry 1982: 48-54)

To the east of Yemen proper, there were some lesser textile centres. Tarim was Hadhramaut's textile capital, working mainly with cotton and indigo. (Berg 1886: 78; Baldry 1982: 42) Two of the shrouds of the Prophet were allegedly woven in Suhar, Oman, and Ibn Battuta praised the textiles of Dhofar in the fourteenth century. (Lamm 1937: 234-5, 238) Despite the penetration of Indian cloth, from Suhar to Sur Omanis wove cotton and dyed with indigo, the latter apparently not employed by weavers in semi-detached Dhofar. Wool and camel-hair were other raw materials, and raw silk was imported for processing. (Bhacker 1992: 133-5; Landen 1967: 82, 145-6) Bahrayn contained the only significant concentration of weavers on the Arab side of the Gulf. (Issawi 1966: 330)

East African and Malagasy textiles

Imports of Indian cloth grew under Portuguese and Omani domination in East Africa, but not all local production was eliminated. (Machado 2005: 91-151) Indeed, not only did cotton cloth survive, but also its main local competitors. Among the Yao, commoners reputedly wore bark cloth or hides, while the elite was clothed in cottons. (Alpers 1975: 21-2) Bark cloth retained a significant market in East Africa, for example in Mozambique, into the twentieth century. (Liesegang 1986: 493; Vail and White 1980: 298-9, 376)

Highland Ethiopia probably produced the largest amount of cotton cloth in the region. (Schaedler 1987: 396-423) Although production occurred throughout this ancient empire, Gondar, Adowa, Ankobar and Harar enjoyed a special reputation. (Pankhurst 1968: 257)

Coastal towns wove cotton cloth from Somalia to Mozambique in the sixteenth-century. The chief production centres were Mogadishu, Pate, Kilwa, the Kirimba [Querimba] islands, the lower Zambezi, and Sofala. Cotton and indigo grew well, and some people picked wild bolls for their needs. Inland, coarse undyed cottons were the staple of southeastern plateaus. Cloth was frequently employed as a quasi-currency, as well as for covering bodies, walls of houses, boats and tombs. (Prestholdt 1998: 24-33; Newitt 1987: 203, 206-7; Davison and Harries 1980; Rita-Ferreira 1999: 116-17) Even humble urban slaves in East Africa wore a single piece of cloth from the waist to the knees, usually consisting of locally woven blue or white material. (Prestholdt 1998: 33)

The Benadir coast of southern Somalia remained in business in the 1840s, when there were still about a thousand weaving households in Mogadishu, and smaller numbers in other towns. Artisan families were

employed full time, buying their food on the market. (Alpers 1983: 81-2, 85, 89) *Gondo* cotton cloth was woven equally late in Sofala. (Machado 2005: 110)

Production of *machira* cloth along the lower Zambezi and the Shire persisted into the twentieth century. This loosely woven undyed cotton fabric was worn by commoners, and made into travelling hammocks by the Portuguese. The mixed-race lords of the Zambezia *prazos* [landed estates] soon began to produce their own *machiras*, or demanded them as tribute from their African subjects. (Newitt 1995: 66, 75, 94, 141, 232, 239; Alpers 1975: 24-5, 36, 55; Isaacman 1972: 66; Pearson 1998: 122; Rita-Ferreira 1999: 117)

Madagascar had a vibrant and diverse textile economy, with weavers praised for their skill by a seventeenth-century Portuguese missionary. (Rita-Ferreira 1999: 117-18) In the sixteenth century, cotton and wild silk were dyed in 'a thousand different colours,' reflecting a wider palette of dyes than on the mainland. Moreover, the island did not limit raffia weaving to coarse stuffs, on East African lines, but produced fine fabrics. (Pretholdt 1998: 29-30) There was warp ikat dyeing of yarn, which was unknown in East Africa but common in Southeast Asia and Yemen. (Mack 1987: 79; Mack 1989: 33-4) Some Malagasy groups had elaborate burial ceremonies, followed by re-burials of dried remains, and shrouds of black cotton or red silk were particularly sacred and valuable in the seventeenth century. (Schaedler 1987: 428)

Production of cloth remained ubiquitous in Madagascar around 1800. Cotton dominated in the northwest of the island, and was much used on the west coast and the central plateau. The eastern and western coastal plains were the domain of fine raffia fabrics. Wild silk was widely produced, Asian insects and mulberry trees only being introduced in the early nineteenth century. (Campbell 2005: 31-2)

Production based on imported intermediate goods

Batik was the form of textile production most clearly stimulated by imports from India, consisting of plain white cotton cloth . (Kraan 1998: 7; Matsuo 1970: 77) Fabric from South India, with its high thread density and even surface, was best suited to the batik technique, even if it was possible to employ cloth of lesser quality. (Hitchcock 1991: 86-8)

Coloured and white cloths both underwent further processing in Sumatra, which had a lively tradition of gilding and embellishing all sorts of imported stuffs. (Andaya 1989: 44) In Siak, East Sumatra, in 1823, dark blue Indian cottons were stamped with gold flowers, and decorated with borders. (Anderson 1971: 205, 355)

Yarn imports were also significant. Eastern Malaya's textile industry was that most dependent on imported cotton and silk yarns. When cheaper English machine-made cotton yarns arrived in the early nineteenth century, they further stimulated weaving in this area. (Maznah 1996: 83-8)

In the case of the Middle East, it is frustratingly difficult to know how much Indian cloth was processed in similar ways. Imports of plain white Indian cloth, significant in Persia in the 1510s, are an insufficient guide, for men frequently wore white cotton garments. (Pires 1944: 21, 30) Artisans in Mamluk Egypt [1250-1517] seem to have printed and embroidered white cotton stuffs from India. (Otavsky et al. 1995: 26; Baker 1995: 76-7) Moreover, cotton prints developed rapidly from the seventeenth century in various areas, responding to the stimulus of Indian competition. (Baker 1995: 160; Issawi 1966: 43; Ferrier 1996: 174) American exporters of unbleached cottons had them dyed in Masqat in the 1830s, the better to appeal to African consumers, suggesting an earlier Omani tradition of processing Indian cloth. (Bhacker 1992: 147)

The situation for yarn is equally unclear. Yemen imported Indian cotton yarns by the eighteenth century, perhaps for local weavers. (Baldry 1982: 49-50) Indian yarn was also imported into Iraq, but some was sent

on to Mediterranean lands, and its final destination may have been Europe. (Issawi 1966: 136)

In East Africa, there were several reports of finished cloth being taken apart to obtain yarn. In Sofala, a Portuguese source described such unravelling of Gujarati cloth in the 1510s, a practice that extended further north into Zambezia. (Prestholdt 1998: 26; Pearson 1998: 122; Rita-Ferreira 1999: 116) In 1570, 'unthreading' was said to be common in Mozambique. (Pearson 1998: 123) Ethiopian weavers similarly imported Indian cloth for its dyed yarn in the late eighteenth century. (Pankhurst 1968: 260) Pate relied on unravelled imported silks, for the only centre of silk weaving on the East African coast. (Prestholdt 1998: 24-5; Pearson 1998: 123)

The trading sphere of Javanese, Madurese and Balinese textiles

By the early fifteenth century, Javanese cloth was being sold in North Sumatra, and possibly exported to China. (Reid 1988: 91, 94) 'Countless' coarse Javanese cloths, from all over the island, were despatched to the great *entrepôt* of Melaka in the 1510s, at a time when large amounts of Indian cloth were imported. (Pires 1944: 169-70, 180) East Java, Madura, Bali and Sumbawa were the heart of a vibrant regional sea-borne trade in cottons in the sixteenth century, including ikat cloths. A fair amount of this cloth also served for the purchase of Maluku spices. (Reid 1988: 92, 94)

Under Dutch naval hegemony from the 1600s, Javanese cloth exports persisted, and then rose sharply and continuously from the 1680s. South eastern Sumatra emerged as the main market, but Borneo and the Straits of Melaka also increased their purchases, fivefold in the case of Javanese cloth despatched from Semarang between 1720 and the mid-1770s. (Nagtegaal 1996: 135-6)

In the case of south eastern Sumatra, Javanese cloth was soon joined by that of Madura and Bali, and then by that of Thailand and Cambodia. By 1691 a Dutch envoy to Palembang declared that most men, from sultan to peddler, were dressed in imported Southeast Asian cloth, although the ladies of the court remained loyal to Indian materials. Nevertheless, imports of Indian stuffs declined sharply. This was despite Palembang's booming economy, fuelled by profits from Bangka tin. (Andaya 1989: 40-1) Glum VOC officials blamed shifts in fashion, reporting that the Javanese increasingly favoured their own 'painted cloth.' (Andaya 1989: 40; Nagtegaal 1996: 135-6, 149)

Barbara Andaya attributes this commercial revolution to the rising prices of Indian textiles, combined with falling prices for Sumatran pepper. Demand from Europe and the Atlantic world pushed up cloth prices in India, and the Dutch East India Company [VOC] monopoly over trade from India made matters worse. Although it is hard to compare prices of different qualities, Javanese cloth may only have been one quarter to one eighth as expensive as its Indian equivalents in Sumatra. However, she also states that the rise in Indian prices only began in the 1690s, a decade too late for this explanation to be truly convincing. Moreover, it is far from clear that overall income from pepper in Sumatra was falling, even if nominal prices were, and she notes that tin revenues were buoyant. (Andaya 1989: 38-9)

Supply factors and product innovation also need to be taken into consideration. A Dutch source of 1688 wrote of the virtual halving of the price of raw cotton in Java, although it is unclear why this was, or whether it was permanent. More attractive is Luc Nagtegaal's argument that Chinese traders began to extend credit to peasant families, in return for guaranteed deliveries of yarn and cloth. (Nagtegaal 1996: 135, 149) Kenneth Hall further suggests that novel production techniques were introduced for batik around this time, albeit without specifying what they were. (Hall 1996: 120) The rise of batik certainly contributed to the surge

in exports from Java, although it is not clear in what proportion. (Andaya 1989: 40-1; Nagtegaal 1996: 135-6) The Dutch first appear to have recorded batik exports from Batavia [Jakarta] in 1641, destined for Bengkulu in southwestern Sumatra, and batik soon became a fixture in the island's trade. (Kerlogue 2004: 17-18; Hitchcock 1991: 23, 94)

Detailed Javanese port statistics from 1774-77 provide a glimpse into the comparative significance of Indian and local cloth in Batavia's trade. The figures show an annual average of some 70,000 pieces of Indian cloth entering Batavia, compared to 13,000 for Bali and 6,000 for Java. The latter, probably batik, came mainly from Semarang, with Surabaya next in line. Smaller quantities were obtained from Tegal and Pekalongan, as well as Sumenep on the island of Madura. Re-exports were mainly to Sumatra and Borneo. The average price of a Javanese piece was a quarter to a third of one from India. (Knaap 1996: 131-3)

Much Javanese yarn found its way to India and Europe. Initially, the VOC sent this product to India for weaving and dyeing. (Nagtegal 1996: 136) In the eighteenth century, the VOC obtained increasing amounts of cotton yarn, often presented as tribute or tax. The finest product came from East Java, and it went to Dutch industries, together with South Asian yarns. (Matsuo 1970: 1-3) This was probably because Dutch industries experienced great difficulties in spinning strong enough warp threads to weave pure cotton cloth, and thus fell back on linen warps and made fustians. (Kraan 1998: 8)

Although Javanese exports fell away as machine-made cloths flooded in from the early nineteenth century, they never entirely ceased. There was still a vigorous local trade in Javanese batik in the 1820s, with Pekalongan, famous for its indigo, one of the main sources for Batavia and Banten. (Enk 1999: 242) In 1834-35, cotton cloth made in Java was sold in Yemen, possibly by pilgrims on their way to Jiddah. (Baldry 1982: 51; Maznah 1996: 89, 102) Small exports of Javanese cloth were recorded in 1858. (Oorschot 1956: 16) Batik proved especially buoyant,

stimulated by imports of cheap machine-made cambric and aniline dyes, and conserving a regional market in the Indian Ocean. (Matsuo 1970: 80-6; Boomgaard 1989: 127-8)

The trading sphere of other Southeast Asian textiles

In the course of the seventeenth century, a powerful new exporter of cloth suddenly arose in South Sulawesi. Makassarese and Bugis traders and shippers, themselves new to long-distance shipping, initially employed the cloth to buy spices in the Moluccas, and then gradually spread it around the whole 'Malay world,' including the Philippines. (Reid 1988: 94-5; Heersink 1999: 12-13, 46-50) In 1785, large amounts of South Sulawesi's checked cloth went 'to all Malay countries.' (Pelras 1996: 242) Cotton *sarung* cloth from this area found a ready market in East Sumatra in 1823. (Anderson 1971: 206, 247, 265)

Sumatra and Malaya drove an intense sea-borne commerce in their own textiles, centred on the Straits of Melaka. Among the imports of East Sumatra in 1823 were 'a variety of silk and cotton cloths' from Aceh to the north, including trousers. 'Rich gold wrought cloths' came from Palembang and eastern Malaya, and enigmatically labelled 'coast blue cloths' appeared. At the same time, East Sumatra exported its own cloth, notably elegant scarves and turbans, within these waters. (Anderson 1971: 206, 247, 265, 312, 354) The internal textile trade of this great island was also very active, with cottons woven in the highlands coming down to the coast. (Dobbin 1977: 19)

Falling imports of Indian cloth into the Malayan peninsula from the eighteenth century provided new opportunities for 'Malay piece-goods,' a term for cottons made throughout the peninsula and the archipelago. In 1835, they accounted for 6% of the value of imports in this category into Singapore, the new great *entrepôt* of Southeast Asia, rising to 11% in 1836, despite the influx of British stuffs. (Maznah 1996: 79-81)

Cottons were exported on a minor scale when the Spaniards began to colonise the Philippines from the late sixteenth century. (Reid 1988: 91; McCoy 1982: 301). However, exports only really took off in the mid-eighteenth century, with the phenomenal success of Panay cloth. Chinese Mestizo merchants were so successful in marketing this product that Iloilo became a boom town, sucking in migrants from far and wide. Weekly fairs were held in settlements around the port of Iloilo to collect cloths to send across the waters. As late as 1855, they accounted for over half the value of Iloilo's exports, and were sold as far afield as Europe and the Americas. (McCoy 1982: 301-3) Other Visayan cloth had more restricted markets, but was exported to the Palau islands of the South Pacific. In contrast, Ilocos cottons were typically exported overland, especially to the Animists of highland Luzon. (Mallat 1983: 143, 188)

Chinese traders probably purchased Vietnamese cotton yarn and cloth from around the thirteenth century, but the main early modern textile export to China and Japan was raw silk. (Reid 1988: 91, 93) Indeed, Tonkin silk was so cheap that shipping it to 'secluded' Japan was for a time one of the most profitable ventures of the VOC. As for cotton cloth, Animists of the southern uplands sent it to the coastal plain. (Li 1998: 66-7, 73-5, 122; Li and Reid 1993: 31, 111)

Sea-borne exports of cottons came more from Thailand and Cambodia. 'Cheap coarse Siamese cloth for the poor people' was already shipped on a fair scale to Melaka in the 1510s. (Pires 1944: 108) From the 1680s to the 1760s, woven cotton cloth from Cambodia and Thailand undersold Indian textiles in South Sumatra. (Andaya 1989: 41; Green 2003: 44)

Central Burma's raw cotton was in plentiful supply, and Reid writes that some yarn was exported overland to Yunnan by the late eighteenth century. (Reid 1988: 91) However, ginned raw cotton made up the bulk of cargoes carried by equids and oxen to Yunnan, and Lieberman only

surmises that Burmese yarn or cloth also took this route at this time. (Lieberman 2003: 145, 170, 172)

The trading sphere of Middle Eastern textiles

Persia was the greatest single Middle Eastern exporter of textiles, with silk, the empire's staple, much in demand in Western Europe. (Ferrier 1996: 173-4) Eighteenth-century political turmoil gravely affected the economy, but exports of silk, cottons, and woollens persisted, especially to Russia, Inner Asia, and the Ottoman empire. (Issawi 1966: 33, 136; Issawi 1971: 264-5, 267) Russia also took considerable amounts of cotton yarn, with 1,500 mule loads destined for Astrakhan in 1848 alone. (Issawi 1971: 264, 267) There were even small silk exports to India around 1800. (Issawi 1971: 269)

Among the stuffs leaving the Ottoman heartlands of Anatolia and the Balkans, cottons gradually overtook silks. In part, this may have reflected re-exports of Indian cottons, coming via Iraq. (Kelly 1968: 36-7; Issawi 1966: 136) However, Istanbul certainly exported significant quantities of its own cotton cloth and yarns to France in the second half of the eighteenth century, despite French protectionist duties, whereas imports from France were negligible. Silks and woollens went in both directions without a clear pattern of dominance, although French woollens consisted of cloth, and Turkish ones of carpets. Moreover, a flourishing export business arose in late eighteenth-century Thessaly, where local cotton yarn was dyed and exported to the Austrian empire and German-speaking lands. (Issawi 1966: 41, 48-9) The more general rise of a Balkan cotton textile industry in the eighteenth century stimulated Ottoman exports around the Black Sea. (Braudel 1981-84: III, 477)

In the early sixteenth century, Greater Syria mainly exported cotton cloth to Egypt, with the white stuffs of Baalbek to the fore. (Lamm 1937: 230) Incorporation in the Ottoman empire then opened new markets in

Anatolia and the Hijaz. (Issawi 1988: 66, 373) By the late eighteenth century, direct exports to Europe were also on some scale, including cotton cloth and yarn, and much raw cotton. In 1784, the French in Sidon 'have one or two agents who buy cotton yarn every Monday or Tuesday,' and the same used to be true of Acre before the Pasha attempted to corner the market. Smaller amounts of mainly raw silk also went to Europe, which sent woollens in return. (Issawi 1966: 33, 219)

Egypt acted as an *entrepôt* for textiles, including cottons from India, Syria, Istanbul and Bursa, which makes it hard to know where certain stuffs were made. (Raymond 1973-74: I, 135-6, 173, 180) Thus, Alexandria exported 'rough cotton piece goods used by Negroes in the West Indies' in 1784, but their place of manufacture was not stated. (Issawi 1966: 33-4). Over the eighteenth century as a whole, the bulk of cottons and linens destined for Europe came from Egyptian looms, in a ratio of around two thirds cottons to one third linens. Proportions were similar in exports to the Red Sea and Sub-Saharan Africa, but reversed in the case of Istanbul and the Maghrib. About a fifth of imported European woollens were re-exported to the Hijaz. (Raymond 1973-74: I, 131, 161, 180-3, 186, 192; Issawi 1966: 475-6)

Yemen's function as an *entrepôt* at the other end of the Red Sea entails similar problems, though re-exports were clearly more significant than in Egypt. There was a marked decline in Yemeni cottons sent up the Red Sea to Egypt from around 1250, due to competition from Indian goods, even if a small flow persisted into the nineteenth century. (Baldry 1982: 22-3, 41-2, 45-50, 53; Otavsky et al. 1995: 26) In the 1510s, coloured woollens were mentioned first on a list of commodities going from Aden to India, apparently a complex mix of local, Egyptian and European products. (Pires 1944: 12-13, 17, 269)

Further east, the Portuguese looted a cargo of Hadhrami black cloth in the harbour of al-Shihr in 1533-34. (Baldry 1982: 42) In 1774, Hadhramaut exported cloth to Yemen. (Issawi 1966: 306) Oman may

have been supplying Indian Ocean markets since its rise to regional naval hegemony in the seventeenth century, and Omani cloth still went to Somalia in the 1840s. (Bhacker 1992: 133; Guillain 1856-57: II, 535) Bahrayn, specialising in making sail-cloth with imported Indian raw cotton, exported small amounts of coarse cloth to Persia in the 1790s. (Issawi 1971: 264; Issawi 1988: 182)

The trading sphere of East African and Malagasy textiles

The Benadir coast of Somalia had an ancient reputation as an exporter of cotton textiles. Back in the fourteenth century, Ibn Battuta noted that the 'unequalled' cloth of Mogadishu was exported 'to Egypt and elsewhere.' (Gibb 1962: 374) In the 1840s, with competition from American cloth rising, Mogadishu's plain white cloth still regularly reached as far down the coast as Mombasa, and occasionally to Zanzibar and other Indian Ocean locations (Guillain 1856-57: II, 532, and III, 323; Reese 1996: 95-6) However, by this time the greatest market for Somali cloth lay inland in the Horn, especially among the Oromo people. (Alpers 1983: 85-6)

The Kirimba islands' indigo-dyed *milwani* cloth sold over wide swathes of East Africa in the sixteenth century. It was part of the 'cloth of the land' that Portuguese traders in Mozambique Island purchased for their commercial operations, and it appears to have been the staple of Comorian traders. (Prestholdt 1998: 27-30; Newitt 1995: 28, 189-90) However, this cloth disappeared from view in the course of the seventeenth century, possibly because of Indian competition. (Newitt 1995: 190-2) *Gondo* cotton sail-cloth of Sofala, also purchased by Portuguese traders, was taken up the coast into Zambezia, a trade that persisted throughout the early modern period. (Machado 2005: 110; Newitt 1995: 28).

Machira from the lower Zambezi was even more successful. Well into the nineteenth century, this un-dyed homespun was widely traded along the coast and far inland, more than holding its own against Gujarati competition. (Alpers 1975: 25; Mudenge 1988: 187; Isaacman 1972: 66, 73-5; Pearson 1998: 122; Rita-Ferreira 1999: 117-18) Portuguese traders sought to gain supplies of *machira* to exchange for gold dust, and the cloth may have been taken by sea to Mozambique island. (Newitt 1995: 28, 78, 214; Alpers 1975: 55)

Indeed, sales of *machira* rose markedly in the eighteenth century. (Machado 2005: 110; Mudenge 1988: 187; Bhila 1982: 122, 131; Lobato 1957: 241-2; Isaacman 1972: 73-5) On the basis of some isolated tax figures, Rita-Ferreira suggests that the cost of this cloth roughly halved between the seventeenth and the eighteenth century. (Rita-Ferreira 1999: 118) He sees this as a negative consequence of Indian competition, but as the market for *machiras* remained buoyant, it suggests improved, if unexplained, productivity.

Madagascar's cloth was exported to Yemen up to the thirteenth century, and was sought after by Portuguese traders in the sixteenth century. (Baldry 1982: 17; Newitt 1995: 28) It not clear whether exports to the Middle East and East Africa persisted, but Malagasy cloth found its way, in European vessels, to newly settled Mauritius from the seventeenth century. Internally, moreover, there was active commerce, with fibres sent up to the plateau, woven, and sold back to coastal areas. (Larson 2000: 50-7; Fee 2005: 94, 98)

Government attempts to restrict or encourage local industries

European thalassocracies sometimes tried to restrict local textiles, in order to reap fiscal advantages from sales of Indian fabrics. Thus, to sell more South Asian cloth in West Sumatra, the VOC long tried to discourage local manufacturing. (Dobbin 1977: 18) From the 1660s, the

VOC banned the planting of cotton in West Sumatra's coastal strip, although the effectiveness of this prohibition is open to considerable doubt. Weaving was certainly flourishing again by the late eighteenth century, by which time the VOC was fatally wounded and short of cloth supplies. (Oki 1979: 148; Dobbin 1977: 18-19)

Caught off guard by the inroads made by Javanese and local cloth in South Sumatra from the 1680s, the VOC responded heavy-handedly. The Dutch first proclaimed that they were extending their monopoly over cloth imports from India to Javanese textiles, in 1681 for Palembang, and two years later for Jambi. However, this proved unworkable. In the 1730s, they turned their fire on local Sumatran producers by 'persuading' the sultans of Palembang and Jambi to order that all cotton shrubs in the hinterland should be destroyed. This was equally ineffective. The VOC therefore decided in 1770 that it would at least cut out Thai and Cambodian textiles, to favour its own sphere of influence in Java, imposing a ban on private trade north of Melaka. (Andaya 1989: 38-41)

In Java itself, the Dutch saw batik as the main danger to profits derived from Indian imports. In 1684, they therefore commissioned Coromandel weavers to copy Javanese batik, but the product turned out to be five times as expensive and not as good. Two years later, the VOC toyed with the idea of prohibiting imports of beeswax, essential to make batik, but soon realised that this would be impossible to enforce. (Nagtegaal 1996: 136)

On the other side of the ocean, the Portuguese authorities in Mozambique were worried that the growing popularity of *machiras* was undermining revenues from Indian imports. In 1750, the Junta do Comercio thus suggested banning the cultivation of cotton in Zambezia, but this was wisely judged to be impractical. In 1753, the authorities came up with an even more hare-brained scheme, whereby they would buy up all available raw cotton and sell it in India and China. (Lobato 1957: 241-

2; Machado 2005: 110) In the event, the Portuguese proved quite incapable of stifling production of *machira* cloth. (Mudenge 1988: 187)

Only the Spaniards tried to stimulate local output of textiles, and that briefly. General Ricafort in the Philippines ordered that 'troops be dressed only in the cloths manufactured in this country.' His order was obeyed in 1826-27, but lapsed thereafter, perhaps because he moved elsewhere. (Mallat 1983: 143)

Attempts to favour the local production of textiles were more typically undertaken by large independent states in the Middle East. A growing influx of Indian cottons caused a worrying 'drain' of silver to South Asia, so that rulers began to encourage cotton industries. Shah Abbas I [r.1587-1629] promoted cotton cultivation in Persia, and protected artisan guilds in his new capital of Isfahan. (Baker 1995: 108-10, 120-1, 135-6, 160)

Ottoman sultans similarly sought to stimulate the use of cotton from the seventeenth century, partly to meet the army's needs for uniforms and the navy's requirements for sails. (Baker 1995: 101-3) The Ottoman state temporarily withdrew from all forms of direct artisanal production in 1709, but it provided interest-free credit and tax holidays, secured raw materials, and encouraged the settlement of artisans. The one thing it would not do, however, was to provide tariff protection, as that contradicted the ruler's Islamic obligation to keep prices low for his subjects. (Ihsanoglu 2004: X, 57-9)

Appropriate technology

European sources are littered with derogatory references to 'primitive' textile technologies, and such comments have all too often been uncritically repeated by later scholars. In reality, simple and elegant techniques were cheap and well adapted to local resource endowments.

In other words, they were as much the secret of success as the cause of failure.

The spinning wheel is thought to have appeared in India in the second half of the first millennium CE, and diffused from there. (Weibel 1952: 14) References to early modern wheels come from all over the Indian Ocean periphery, but it is difficult to get a sense of when, and to what extent, the wheel displaced the spindle, which long persisted in many places. (Raffles 1817: I, 168; Hall 1996: 99; Hunter 1968: 81; Pankhurst 1968: 258; Weir 1970: 8)

The evolution of looms, almost always made of perishable wood or bamboo, is only a little easier to trace. Body-tension looms, often called backstrap looms, were probably the most ancient form in Southeast Asia. They were pictured on a Yunnan bronze from Han times, described by a Chinese pilgrim in late thirteenth century Cambodia, and appeared in Javanese carvings of the fourteenth and fifteenth centuries. Cheap to make and easy to store, such looms were well adapted to part-time home weaving. The oldest forms probably had a continuous warp arrangement, turning out tubular cloth for *sarung*, and they remained popular in sparsely peopled upland zones. (Fraser-Lu 1988: 33-5; Hitchcock 1991: 53-64; Pelras 1996: 243-4; Green 2003: 59-60)

By 1800, some Southeast Asians wove on horizontal frame looms, which were situated on or above ground level, and had two heddles worked by treadles. More expensive and taking up more space, they were also more productive, enabling full-time weavers to weave wider cloths. Some were solid affairs, but minimalist versions also appeared in the remote highlands of Mainland Southeast Asia. (Fraser-Lu 1988: 36-9; Hitchcock 1991: 65-71; Green 2003: 60-7) The pit looms of India, with the treadles below the ground, were not found. (Raffles 1817: I, 168)

The Middle East had a particularly varied selection of looms. The oldest were the single-heddle horizontal models of ancient Egypt, which nomads continued to favour into the twentieth century. Vertical warp-

weighted varieties existed, notably for carpets, for which body-tension looms were also occasionally employed. From about the second century CE, double-heddle frame or treadle looms appeared in Egypt, and thence diffused all over the settled Middle East, often in the form of pit looms. For really complex types of cloth, drawlooms evolved by the fifteenth century in Egypt, with multiple heddles and a drawboy lifting further groups of warp yarns with cords. (Baker 1995: 26-8, 70; Weir 1970) For fine Persian silks in the late seventeenth century, five to six men worked on looms employing between 24 and 30 shuttles. (Ferrier 1996: 173)

East Africa could be split into two zones. The northeast, down to the present Kenyan coast, used double-heddle horizontal pit looms, on Middle Eastern and Indian lines. (Picton and Mack 1989; Schaedler 1987: 93-9; Alpers 1983: 80-1; Pankhurst 1968: 259-60) Further south was the domain of single-heddle horizontal ground looms. (Davison and Harries 1980: 181-2; Schaedler 1987: 56-64; Alpers 1975: 24-5; Pearson 1998: 122; Rita-Ferreira 1999: 117)

Madagascar boasted a diversity of looms. Southeastern Africa's single-heddle horizontal model was most common, especially in the west. Along the northeastern coastal strip, the heddle rod was sometimes lashed to the rafters, as in parts of the Persian Gulf, and there were many double-heddle looms by around 1800. Finally, parts of the southeast used body-tension looms with continuous warp, strongly resembling those of Southeast Asia. (Mack 1987: 84-6; Mack 1989: 22-31; Schaedler 1987: 63, 74; Fee 2005: 94; Hitchcock 1991, 59)

Social relations of production

Social practices governing cloth production may have been a greater constraint on productivity, although this remains to be demonstrated. Culturally allocated gender roles were inflexible in weaving, but less so in other parts of the textile process. The scale of

production varied, and is hard to correlate with success or failure. Labour coercion was possibly a negative factor, but it was patchy.

Men wove and dyed in the Middle East and East Africa, as in India, and there seem to have been no exceptions to this rule. (Baker 1995; Ferrier 1996: 173; Bhacker 1992: 133; Mack 1989: 21) Spinning was usually a female occupation in India, but the situation in the Middle East and East Africa was more fluid. The male guilds of Mosul were unable to prevent the spinning of cotton and wool becoming and remaining 'a monopoly of women, urban and rural' from the last decades of the seventeenth century. (Khoury 1997: 138; Shields 2000: 77) Women also spun in Palestine at a later date. (Weir 1970) Both men and women did so in Ethiopia, whereas women monopolised this activity in Somalia (Schaedler 1987: 396-423; Pankhurst 1968: 257; Alpers 1983: 79; Reese 1996: 94) On the lower Zambezi, it was said that men did almost everything, including much growing of cotton. (Alpers 1975: 25) However, a Portuguese source of the 1590s described women as spinning in this region. (Rita-Ferreira 1999: 117)

Women wove in Southeast Asia, as in China, and more generally dominated the textile chain. (Reid 1988: 93; Owen 1978: 157-8; Fraser-Lu 1994: 256-8; Pelras 1996: 241; Maznah 1996: 5, 91-2; McCoy 1982: 303) Indeed, mid-nineteenth century parish registers from southwestern Luzon recorded every bride as a weaver by profession. (Owen 1978: 165) Female labour was the norm in production and finishing, and women often harvested cotton bolls as well. Men's role was restricted to supplying wooden and metal equipment, and to some growing of raw cotton. This held good across religious divides between Muslims, Hindus, Christians, and Animists. Noble women took pride in weaving fine cloth, and older women were generally more skilled. (Hitchcock 1991: 123-31; Owen 1978: 157-8, 165; Kraan 1998: 6)

The division of labour by gender was deeply rooted, for women nearly always wove in Madagascar, even when using looms of an East

African type. This prominence of women in Malagasy textiles almost certainly reflected ancient waves of Southeast Asian migration to the great island. (Mack 1987: 77; Mack 1989: 21; Prestholdt 1998: 27, 30) In 1777, a French traveller in the highlands even opined that women were so busy weaving that men undertook most domestic chores. (Larson 2000: 124) Male weaving only occurred among the Antaisaka people of the southeast, and for the production of red silk shrouds for dead nobles in northern Imerina. (Mack 1989: 21; Campbell 2005: 31)

Servile work appear to have been more common than in India or China, although the distribution of such labourers was extremely uneven in time and space. Coercion not only affected slaves, but also serfs, debt peons, inferior castes, religious minorities and other 'subalterns.' This did not reflect low population densities, for coercion was frequently encountered in the most densely peopled areas, but it may have signalled dysfunctional labour markets. Low remuneration was probably more than offset by low productivity, making servile labour more of a handicap than an advantage, as Parviz Mohebbi has cogently argued for Persia. (Mohebbi 1996: 149, 207, 215) Different parts of the textile process could have different configurations. Thus, spinning was an honourable profession in Ethiopia, but weaving was allocated to despised minorities. (Pankhurst 1968: 258-9)

Java had much bonded labour. Workers of servile status existed from at least the seventeenth century, especially in large textile establishments close to towns and royal courts. (Matsuo 1970: 77) In 1684, 'thousands of women' produced cloth in the 'weaving mills' of Kartasura, Mataram's capital. However, individual peasant women simultaneously brought small packets of cloth to local markets, which were bought and exported by Chinese traders. (Nagtegaal 1996: 135) Early nineteenth century weaving workshops in Cirebon exploited the labour of indebted women. (Burger 1975: I, 58) In contrast, fine batik was largely reserved for high class ladies at this time. (Kraan 1998: 7)

The Spaniards rejected slavery in the Philippines, but debt remained a problem. Leading Chinese Mestizo merchants of Iloilo regularly had 6 to 12 looms at work in their compounds. In law, their workers received monthly wages. However, many women were heavily indebted, and it was alleged that a trifling initial loan could imply years of bonded labour. (McCoy 1982: 303)

Servile workshops existed in the Middle East, most famously for silk production in Bursa, northwestern Anatolia. These workshops generally contained up to ten looms and twenty workers, with contractual manumission as a mechanism for lowering supervisory costs and increasing productivity. However, rising slave prices led to more hiring of workers on a weekly basis from the seventeenth century, as silk began to make way for cotton prints. (Inalcik 1979: 27-9; Baker 1995: 86-7)

Middle Eastern entrepreneurs were at times drawn from ethnic or religious minorities. Thus, Christian Armenians owned most of the textile workshops of Istanbul. (Baker 1995: 160) Similarly, about twice as much Christian as Muslim capital was invested in Damascus weaving shops in the 1830s. (Issawi 1966: 224)

The existence of large workshops was not necessarily a precondition for servile labour to prevail. In East Sumatra in 1823, it was said that, 'in almost every house at Batubara is one or more looms; and the slave girls spin, dye and weave.' These slaves were mainly Animist Batak, brought down for sale from the highlands. (Anderson 1971: 312) Theravada Buddhist kings seized numerous weavers in war, and resettled them in serf villages around their capital cities, notably in Burma and Thailand. (Fraser-Lu 1988: 88, 116-17, 120; Fraser-Lu 1994: 258)

Servile labour in domestic settings existed elsewhere. In Hadhramaut, textile production was dispersed in people's houses, and weavers were assisted by a couple of slaves, or servants from lower social strata. (Berg 1886: 78) Yemeni Jews, subject to various forms of discrimination, specialised in weaving according to their unique

technique, although Muslims also participated in this activity. (Baldry 1982: 46, 55) In southern Somalia, slaves, ex-slave clients and people of low castes mingled with free Somalis in a system of production that was both highly specialised and family-based. (Reese 1996: 94-8; Alpers 1983: 81-4) Many women in the highlands of Madagascar worked full time in cloth manufacture, and a report from 1826 noted that this included every kind of woman 'from the King's wives to the slaves.' (Larson 2000: 128; Fee 2005: 94)

Home weaving seems to have been the norm around the Indian Ocean periphery, even in countries with a strong urban tradition. Javanese peasants satisfied most of their own textile needs, and restricted weaving to the off season. (Oorschot 1956: 13-14; Kraan 1998: 4) Chinese merchants ran a putting out system in central Java from the late seventeenth century, and the same appears to have been true of eastern Malaya around 1800. (Nagtegaal 1996: 135; Maznah 1996: 4-5) In northwestern Madagascar in the sixteenth century, cloths were woven to order, but in individual homes. (Prestholdt 1998: 30) Even in eighteenth century Egypt, spinning was a rural and familial activity, although weaving and dyeing tended to take place in larger urban establishments. (Raymond 1973-74: I, 229-31)

Conclusion

Although lying beyond the realm of proof, it seems that Indian textile exports not only failed to de-industrialise the Indian Ocean periphery, but actually stimulated its development. Most obviously positive was the supply of intermediate goods, whether cloth or yarn. The sale of local textiles in regional markets also benefited from economies of scale, notably in shipping and financial services, and lower transactions costs, so that local exports 'piggy-backed' on flows of South Asian cloth.

In addition, India supplied models for local industries to emulate, and even surpass.

The ability of peripheral textiles to retain 'niche' markets at home has long been recognised, but successes in the export field have received much less acknowledgement. It is especially significant that new products emerged, and were aggressively exported, in the course of the early modern period, such as Bugis checks of South Sulawesi, Panay cloth of the Philippines, or Thessaly dyed cotton yarn in the Balkans.

Far from Indian cloth exerting a growing and inexorable hegemony, the evidence suggests that Indian exports were faltering, and in some cases markedly declining, from the late seventeenth century. The usual explanation is that growing demand from the West, coupled with inflexibilities in South Asian production processes, pushed prices of Indian textiles too high for the impoverished inhabitants of the Indian Ocean periphery. However, this seems unsatisfactory. Incomes may well have been rising overall, and too little credit is given to as yet unexplored improvements in the productivity of peripheral textiles.

European cloth only impinged to any degree on the Middle East, where exchanges remained quite balanced in this period. European woollen cloth gradually penetrated this market, but silk cloth went in both directions, and Middle Eastern producers of cotton cloth and yarn, as well as woollen and silken carpets, held the upper hand. European imports of cotton yarn, which also came from Java and India, underline the problems encountered in producing warp threads of sufficient quality in the continent's new industry.

An understanding of the base-line, prior to the mass arrival of industrially produced textiles from around the 1840s, makes it easier to grasp later developments on the Indian Ocean periphery. As industrialisation gathered pace, advancement and retardation in part reflected earlier patterns of development. Although there have been substantial and understandable exceptions, those areas which had the

most advanced early modern proto-industries tend to be those with the most flourishing modern industries.

Finally, a better knowledge of conditions in export markets around the Indian Ocean might yield a more sophisticated understanding of the strengths and weaknesses of early modern India's proto-industry. In the case of Indian hand weaving in the nineteenth and twentieth centuries, Tirthankar Roy has argued that the weaker partner to some extent shaped the development of the stronger partner in the competitive struggle. (Roy 1996: 13) This may also have been the case for local textile production on the periphery of the early modern Indian Ocean.

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