1 Identifying Root Causes of Economic Development in the Middle East: Structural Change, Division of Labor, and Smithian Growth Theory

Maya Shatzmiller
Western University

INTRODUCTION

Adam Smith recognized the division of labor as an indicator of economic development and growth, and a leading factor in higher labor productivity, with additional dimensions in the expansion of the markets, urbanization, trade, and human capital. In this essay, I identify an episode of Smithian growth in the Middle East, where the division of labor occurred early and remained on full display during the entire medieval period, and I compare it with the transition to economic growth in premodern Europe beginning in the seventeenth century. I provide quantitative and qualitative evidence to substantiate the prevalence of the division of labor and occupational specialization in the manufacturing and service sectors and demonstrate it using evidence from the textile industry. The division of labor and occupational specialization are then linked to the extension of the markets and aggregate demand through the exploration of human capital, urbanization, and commercialization.

DIVISION OF LABOR AND SMITHIAN GROWTH

In *The Wealth of Nations* (1776), Adam Smith was the first to suggest a link between the division of labor and the origins of economic growth: "Subdividing production into separate tasks and letting different producers specialize in each will improve the efficiency of all." He observed that the process of shifting the labor force from rural occupations to urban ones was accompanied by the specialization of each trade, which improved labor productivity and lowered production costs. However, he also linked this shift to demand, since the division of labor is conditioned by "the extent of the markets"—the growth of the aggregate demand for goods and services, itself a function of population size, income level, trade efficiency, social order, and law. That entire construct is known as "Smithian growth theory" and is used in reference to various cases analyzing economic growth.[1] Accounting for the role of human capital in the growth process, Smithian growth theory is frequently

1 Barkai, "Formal Outline."

associated with "Schumpeterian growth."[2] Like Smithian growth, Schumpeterian growth shares postulations about the role of the division of labor but highlights improvements in the stock of human knowledge and technological progress in it, and links knowledge to capital investments in technological innovation.[3]

Economic historians of ancient and medieval societies do not usually refer to Smithian growth when debating whether economic development occurred, and with good reason—they cannot demonstrate the existence of the division of labor as defined. Indeed, claiming Smithian growth in societies that lived on a subsistence level, or slightly better than subsistence, is tricky. Even as the investigation improves and findings suggest comparative levels in terms of real wages and standards of living, at no time could quantitative evidence be offered to point to the division of labor before the sixteenth century.[4] Using the methodology known as "occupational classification in economic sectors," Carlo Cipolla showed deepening specialization in sectors through evidence dating from late sixteenth-century European cities.[5] He approximated and supplemented such specialization with urbanization rates, which were rising in Italy, England, and Holland between 1500 and 1600, but he was unable to find earlier evidence.[6] Gregory Clark and others provided lists of occupations in sectors for sixteenth- and seventeenth-century England in a study of farm workers.[7] These lists show that more than a third of rural workers were engaged in nonfarm activities in the years before 1700, but again not the urban division of labor favored by Adam Smith.[8] Karl Persson and Paul Sharp, who recently argued for early medieval economic revival in Europe (earlier than previously thought), point to economic change in late medieval Europe using numbers of occupations in several European cities beginning in 1300.[9] Morgan Kelly returned to Adam Smith's China case as being a society that experienced the early division of labor and supported the case for Smithian growth there by pointing to the impact of a new river transportation system.[10] It was the building of a system of water canals that brought small and less developed production systems together to form a unified trade network. In his analysis, Kelly supplied the Smithian requirement of the "extension of the markets" and aggregate demand.[11] Adam Smith's notion that the division of labor is limited by the extent of the markets may have been inspired by England's eighteenth-century commercial development, a product of an earlier phase of increased commercialization and international trade.[12] Yet Kelly argued that the Chinese division of

2 Mokyr, *Lever of Riches*; Zachariadis, "R&D." Barkai, "Formal Outline," highlights the dynamism in the interaction between labor and technology.

3 Mokyr, *Lever of Riches*, 4–5.

4 Allen, Bengtsson, and Dribe, *Living Standards*, 1–6.

5 Cipolla, *Before the Industrial Revolution*, 76–78 with table 2-7.

6 Persson and Sharp, *Economic History*, 41, fig. 2.3 ("Urbanization in Europe and China: Urban population as a percentage of total population").

7 Clark, Cummins, and Smith, "Malthus."

8 Clark, Cummins, and Smith "Malthus," 388–89, ("Appendix: Assignment of Occupations to Sectors").

9 Campbell, *Great Transition*, 125–26; Persson and Sharp, *Economic History*, 25–46 with table 2.1 ("Increasing division of labour as measured by number of occupations").

10 Kelly, "Dynamics of Smithian Growth."

11 Kelly, "Dynamics of Smithian Growth," 960.

12 Britnell, *Markets, Trade and Economic Development*; Britnell and Campbell, *Commercialising Economy*.

labor occurred in the agrarian sector, as the new transport system allowed rice shipments to move efficiently to the markets.

Smithian growth theory remains close to the economic genesis of Europe in the later Middle Ages through the economic powers' initially being absent but then appearing. For instance, at first an unstable supply of money hindered the volume of trade; markets were imperfect, information flowed slowly, and it was distorted along the way.[13] The Dark Ages in Europe were also characterized by political disorder, which harmed market exchange and made it costly and risky. Persson and Sharp attributed a major role to the division of labor. European society in the post-Roman period relied on a thin basis of knowledge and on human capital; the division of labor was crude and extracted from experience—"domestic knowledge"—which constrained production.[14] Earlier gains in Europe were made from repetition or practice—"economies of practice" for short—and learning by doing, thereby allowing producers to specialize.[15] By the ninth century, the division of labor was an extension of useful knowledge and artisans' promoting technological change. Increases in population levels, monetary circulation, transport and trade routes, urbanization, production, and technology changed the economic environment and allowed specialization to trigger a decrease in opportunity costs and an increase in output per worker. Once achieved, skills that the division of labor helped grow continued to improve, but at a decreased rate during Europe's rebound from the Dark Ages. At the same time, the accumulation of knowledge stimulated by theoretical inquiry occupied a central place in Europe's version of Smithian growth theory; not only does this theory explain the role of technological innovation in the division of labor, but it also shows how a decrease in demand limits accumulated knowledge, thus leading to economic decline.

I have used the same methodology for the Islamic case with more than adequate results for understanding economic development. Not much is known or understood about the details of economic life in the premodern Islamic world, and until recently the main criterion for economic growth—namely, a rise in living standards and their maintenance in the long run—could not be substantiated. A recent study I coauthored with Sevket Pamuk has changed our concept of living standards in the medieval Middle East through the study of wages, and while more evidence is always needed, our estimates of wages and purchasing power strongly suggest higher living standards in the cities.[16] Using numeric data from the Arabic sources, it was possible to build a consumer price index for the eighth through fifteenth centuries and to calculate the purchasing power of wages in terms of basic goods. The study demonstrated that real wages of unskilled workers in medieval Iraq and Egypt ranged between two and three times the subsistence level for most of the medieval period, a stretch of 700 years. When compared to workers in ancient Mesopotamia,[17] Rome,[18] Byz-

13 Persson and Sharp, *Economic History*, 26–28.

14 Persson and Sharp, *Economic History*, 30.

15 Persson and Sharp, *Economic History*, 26.

16 Pamuk and Shatzmiller, "Plagues, Wages, and Economic Change."

17 Foldvari and van Leeuwen, "Comparing Per Capita Income."

18 Scheidel, "Real Wages"; Scheidel and Friesen, "Size of the Economy."

antium,[19] and medieval Europe,[20] unskilled workers in the Middle East most likely enjoyed the highest standards of living among contemporary societies.[21] These findings are significant, with important consequences for our understanding of economic performance and the economic history of the medieval Middle East.

In the same study, the high wages in the Middle East were linked to the tremendous decline in population levels after the Justinianic plague and its recurrences (541–750) and to the rising demand for labor. The findings presented in the current essay go beyond the initial demographic shock of plague in the Middle East and help explain why wages remained high even after population levels began to recover. Smithian growth theory is also supported by rising literacy rates and the use of books, which were the basis for technological innovation in Europe, and much is explained by the improvements in the quality of human capital and transformations in the accumulation and transmission of knowledge.[22] In the case of the Middle East, the increase in human capital was strongly supported by developments in literacy tools, mostly the invention of Arabic paper.[23] The adoption of paper made of linen rags changed writing and reading practices forever; it directly affected levels of literacy and numeracy in society, helped move information from a stage of oral preservation to written texts, and affected the ways knowledge was stored and technological data transmitted.

Investigation of knowledge accumulation, knowledge transmission, literacy, and numeracy, as well as of human capital in general, in relation to economic development will benefit from a comprehensive exploration of Schumpeterian growth patterns in the Middle East. Until such an exploration takes place, I have used qualtitative and quantitative evidence to demonstrate the division of labor and specialization in the medieval Islamic economy.[24] A large database of occupational trade names collected from numerous Arabic sources made it possible to apply the methodology of occupational classification in sectors of employment and determine degrees of specialization in each industrial branch.[25] The statistical work revealed significant division of labor in the urban centers, a division that persisted during the entire medieval period, albeit with a slight decline in the later Middle Ages. The findings alerted me to the existence of other indicators of Smithian growth in the Islamic Middle East, such as the expansion of markets, urbanization, transportation, and capital infusion. The rest of thia essay is devoted to exploring them, as well as adding insights to Smithian growth from the Islamic case.

19 Milanovic, "Estimate of Average Income."

20 Goldstone, "Efflorescences"; North, *Structure and Change*; Persson and Sharp, *Economic History*.

21 Bolt and van Zanden, "Maddison Project."

22 De Vries, "Between Purchasing Power"; Mokyr, *Lever of Riches*, 5; Ogilvie, "Consumption"; Reis, "Economic Growth."

23 Shatzmiller, "Adoption of Paper."

24 Shatzmiller, "Early Knowledge Economy."

25 Shatzmiller, *Labour*. The database is accessible online at https://www.medievalislamiceconomy.uwo.ca/labour/occupational_classification_in_sectors_of_employment/index.html.

DIVISION OF LABOR IN THE ISLAMIC CITY

Occupational classification consists of grouping and ranking jobs in various sectors in the economy and measuring the degree of the division of labor.[26] Using an extensive number of Arabic sources from Egypt, Iraq, Syria, Muslim Spain, and North Africa, I have conducted a statistical analysis of trades in various Islamic cities, including capital cities. It was possible to generate a new databse of Arabic trade names and divide them into two chronological segments, the eighth to eleventh and the twelfth to fifteenth centuries. The statistical results are presented in table 1.1. We can now make observations about the degree of the division of labor and, by extrapolation, the size of the labor force in each industry under the assumption that greater division of labor represents more artisans. Persson and Sharp did their survey of the Middle East by counting occupations in the Bible; the Arabic sources arguably provide better documentation.[27]

Table 1.1. Unique (total cases of) occupations in sectors of employment.

	Number of unique occupations		
Employment sector	**8th–11th centuries**	**12th–15th centuries**	**Percentage change**
Extractive	49 (63)	29 (35)	−40%
Manufacturing	432 (697)	406 (679)	−6%
Service	522 (736)	883 (1,175)	+69%

Source: Shatzmiller, *Labour*, 170.

The spread of specialized occupations suggests several conclusions—first, that the "unique" cases in table 1.1 of a single trade name or occupation represent an extensive division of labor; second, that the number of times each occupation is cited in all sources is indicative of its wide spread in the urban centers. Since the sources derive from various cities in the Islamic Middle East and North Africa, an observation of general specialization in the urban sectors is sustained. Specialization in the primary sector was limited and declined further in the later Middle Ages. Mining occupations, for reasons of an early mining boom, expanded but then contracted. As for the effect of human capital, Andrew Watson has laid the foundations for linking agrarian knowledge to productivity through the existence of agrarian manuals.[28]

In comparison, division of labor in the manufacturing and service sectors was considerable. The numerical representation of food-processing occupations—namely, trade names producing ingredients and making dishes and processed foods—shows that they

26 Shatzmiller, *Labour*, 11–13 (discussion of the methodology), 169–323 (detailed analysis); "Artisans: Pre-1500."

27 Persson and Sharp, *Economic History*, 40. For a list of the sources, see https://www.medievalislamiceconomy.uwo.ca/datasets/MedievalIslamicOccupationalClassifications.xlsx.

28 Watson, *Agricultural Innovation*. More studies of technological improvements are required.

occupied the largest share of the labor force: 21 percent of the city producers. They were followed by occupations in the textile industry (19 percent of the total) and the metal industry (16 percent) (fig. 1.1). As we move from the early period to later, between the twelfth and fifteenth centuries (fig. 1.2), almost all sectors and most types of occupations show a drop in numbers, as presented in table 1.2. The number of occupations by type in the manufacturing sector followed the raw material used and the nature of the activities undertaken in processing it. The numbers indicate that contraction occurred in almost

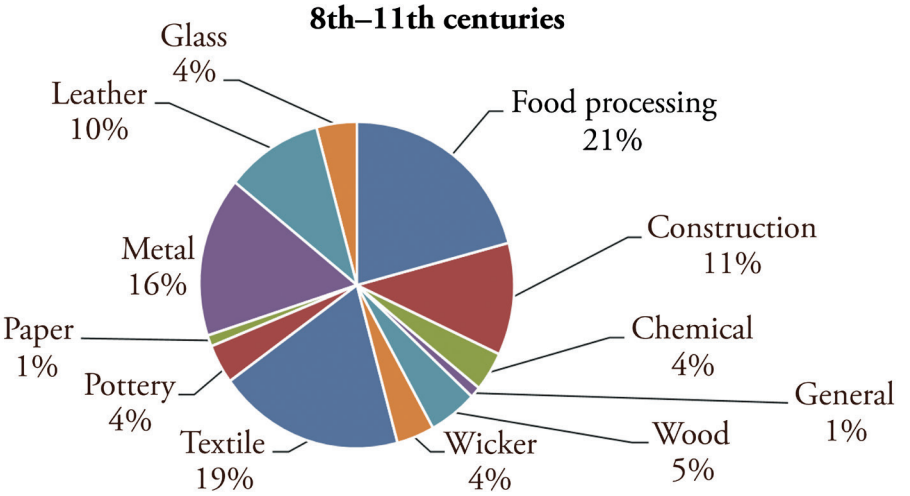


Figure 1.1. Distribution of the labor force in manufacturing in the eighth through eleventh centuries. The percentages represent the share of total manufacturing occupations (after Shatzmiller, Labour, 201).

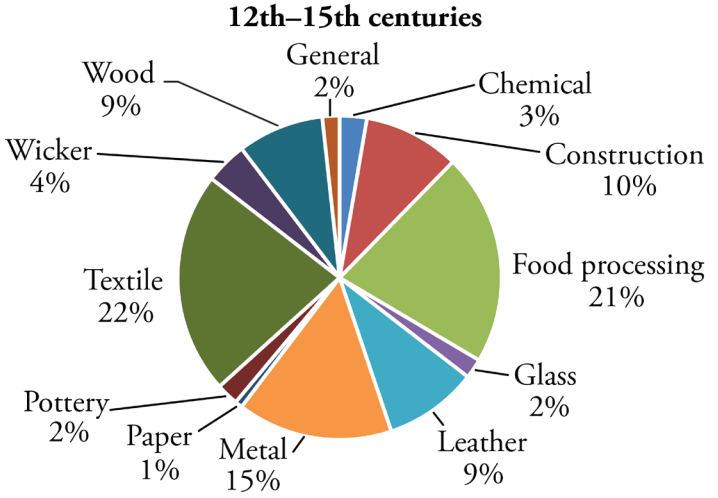


Figure 1.2. Distribution of the labor force in manufacturing in the twelfth through fifteenth centuries. The percentages represent the share of total manufacturing occupations (after Shatzmiller, *Labour*, 201).

Table 1.2. Number of unique occupations (cases) in manufacturing, by type.

	Number of unique occupations (cases)	
Type	**8th–11th centuries**	**12th–15th centuries**
Chemical	16 (29)	11 (26)
Construction	50 (64)	39 (58)
Food Processing	88 (156)	86 (170)
Glass	13 (20)	8 (13)
Leather	39 (72)	38 (64)
Metal	68 (111)	63 (100)
Paper	4 (8)	3 (9)
Pottery	17 (26)	9 (10)
Textile	80 (128)	90 (145)
Wicker	20 (26)	17 (22)
Wood	32 (50)	35 (53)
General	5 (6)	7 (9)

every type of manufacturing occupation over the second term (the period covering the twelfth through fifteenth centuries) except for occupations in the textile, wicker, wood, and general categories.

The results are not at odds with precedence. By the end of the eleventh century, the expansion in specialization and the division of labor had slowed. As predicted by Smithian growth theory, an increase in the division of labor would be difficult to maintain. Persson and Sharp suggested that the decline in division of labor was a result of a decrease in population, as well as other factors such as political instability.[29] The ready availability of written sources in the Islamic world stands in strong contradistinction to the scarcity of written sources in early medieval Europe. In the Islamic case, the decline of specialization was not universal but selective, with some branches actually increasing in specialization.

By establishing the numerical relationship between the types of industries, occupational classification methodology assists us in estimating the percentage of the labor force employed in each one. Cipolla used the methodology to determine the distribution of the "economically active urban labor force" in fifteenth- to seventeenth-century European cities. He concluded that the labor force employed in the food, construction, and textile types accounted for 55–65 percent of the urban labor force in seventeenth-century Europe.[30] The

29 Persson and Sharp, *Economic History*, 32–33.

30 Cipolla, *Before the Industrial Revolution*, 76–78.

food, textile, and construction industries in Islamic cities amounted to 51 percent of the labor force.

DIVISION OF LABOR IN THE MANUFACTURING SECTOR AND THE TEXTILE INDUSTRY

The textile industry provides evidence for the case I am making. Not only does it demonstrate a wide degree of evidence for specialization and the division of labor, but the prices of textile items also may be used to demonstrate aggregate demand and the expansion of markets.[31] The list of trade names compiled from the Arabic sources contains eighty occupations related to textile manufacturing (see list 1 in the appendix). In comparison, evidence from textile-related occupations in sixteenth- to seventeenth-century England shows ninety occupations, including leather-making occupations such as shoe making.[32] Our classification divided trade names according to the raw material used, so it distinguished between textile and leather, with the leather-making trade names providing thirty-nine distinct occupations (see figs. 1.1 and 1.2). Other reasons for the differences in numbers may be related to the different environments studied, the Islamic environment being that of cities and the English environment being rural—farm workers still on the farm. Furthermore, the urban environment meant that the list from Islamic cities included sellers of textiles, who reflected a mature textile manufacturing apparatus. The extensive specialization in textile occupations is matched by the range of prices of garments found in the Cairo Geniza documents. I have used two sources to compile the price list in table 1.3: one of regular garments compiled by Eliyahu Ashtor from Geniza sources,[33] the other of expensive garments derived from the bridal trousseau lists compiled by Yedida Stillman from the same provenance.[34] The combined lists produced a database of hundreds of items of different garments, from which twenty-three items were selected to represent average prices.

The prices of textile items were determined by a range of market factors, including the price of raw materials and the cost of labor. The price and quality of the raw material used reflect the pigments and dyes used to stain it. Garments made of linen, cotton, and wool used raw materials produced in Egypt, to which must be added the price of their transport. The price of items made of brocade and silk, and those decorated with embroidery, gilding, or borders in a range of colors including yellow, blue, ruby, reddish violet, sand,

31 For similar links between textile production and growth in medieval England, see Campbell, *Great Transition*, 126–30. To avoid repeating the details of the textile evidence, see previously published material on the primary sources and the literary qualitative evidence of growth in textile production: Shatzmiller, *Labour,* 118–23, 240–49. On the Islamic textile industry, see, among other works, Lombard, *Les textiles*; Serjeant, *Islamic Textiles.*

32 Clark, Cummins, and Smith, "Malthus," 364–92 with appendix for details. The list from England also contains makers of leather clothing items not included in our list, which used the raw material as a classification criterion. Obviously, adding makers of leather clothing would have increased our database even further.

33 Ashtor, *Histoire des prix*, 152–74.

34 Stillman, "Female Attire."

Table 1.3. Average prices of clothing items, Egypt, eleventh to thirteenth centuries (in gold dinars).

Regular consumption item (Ashtor)	**Price**	**Expensive item (Stillman)**	**Price**
Simple *thaub* (cloth)	1–2	*Thawb*	6.20
Elegant *thaub* (cloth)	3–4	*Jukāniyya*	3.37
Simple *ghilāla* (cloth)	1.50	*Mindil*	3.04
Elegant *ghilāla* (cloth)	4	*Mukallaf*	2.72
Simple *jukāniy*a (cloth)	0.50	*Niqab*	1.25
Elegant *jukāniya* (cloth)	1–3	*Radda*	2.18
Simple *mindil* (scarf)	0.33–0.50		
Elegant *mindil* (scarf)	1–2		
Simple *wasat* (waist wrap)	1–1.50		
Elegant *wasat* (waist wrap)	2.50–3		
Simple *mal'a* (outer wrap)	1		
Elegant *mal'a* (outer wrap)	3–4		
Simple *milhafa* (coat)	1		
Elegant *milhafa* (coat)	2–3		
Simple *ridā* (cloak)	1		
Elegant *ridā* (cloak)	3		
Makhtūma (dress)	≥5		
Khil'a (robe of honor)	10–15		
Turban	2–3		
Elegant *mi'jar* (head cover)	2–3		
Simple skullcap	1		
Elegant skullcap	2		
Head cover	1		

and wax, which may have used pigments imported over a distance, were higher because they included the transport price. Such items could be sold for tens of dinars as compared to the same item made of cheaper materials. For instance, a *thawb* made of cotton, linen, wool, silk, or a combination of two of these fabrics was a staple, indispensable item of clothing that was regularly and commonly worn and had the standard price of one dinar

(fig. 1.3).[35] The price of the two most common items, the *thawb* and the *jukaniyya*, a staple outfit for men and women, ranged in price from 1 to 2 dinars, but a luxury item of clothing cost 6.2 dinars. As elsewhere, the price of expensive garments indicates to us that luxurious, expensive garments became a depository of wealth.

The quality and time of work involved in producing the garment or cloth included weaving and sewing, embroidery or gilding, and fashioning the elaborate decorations on the borders. Yet the price of labor was influenced by the efficient, gender-sensitive division of labor that developed after the entry of women into the labor force. At first, women drove specialization by taking over a multitude of tasks in the textile industry; later, women exercised a monopoly over the spinning of all threads—wool, cotton, flax, silk—and over the manufacturing techniques of some of the fancy clothing items, such as dyeing silk and sewing. An upsurge in income distribution to women changed labor organization in the cities. A putting-out system was put in place to accommodate spinners and seamstresses working at home. Networks of male and female brokers appeared for distributing threads, cloth, and raw materials; collecting the finished items; and disbursing payments.[36]

Women's wages, while lower than those of men, affected economic development in other ways, too. Just as significant as women's entry into labor markets was the accumulation of wage income in women's hands—it created an upsurge in income distribution to women and increased household income.[37] As female wage earners garnered income in addition to other capital transfers coming to them at marriage or through inheritance, they began to play a considerable role in the household's finances and contributed to the aggregation of consumers in the markets. The growing purchasing power of wages affected the level and structure of demand. There is evidence as early as the ninth century that

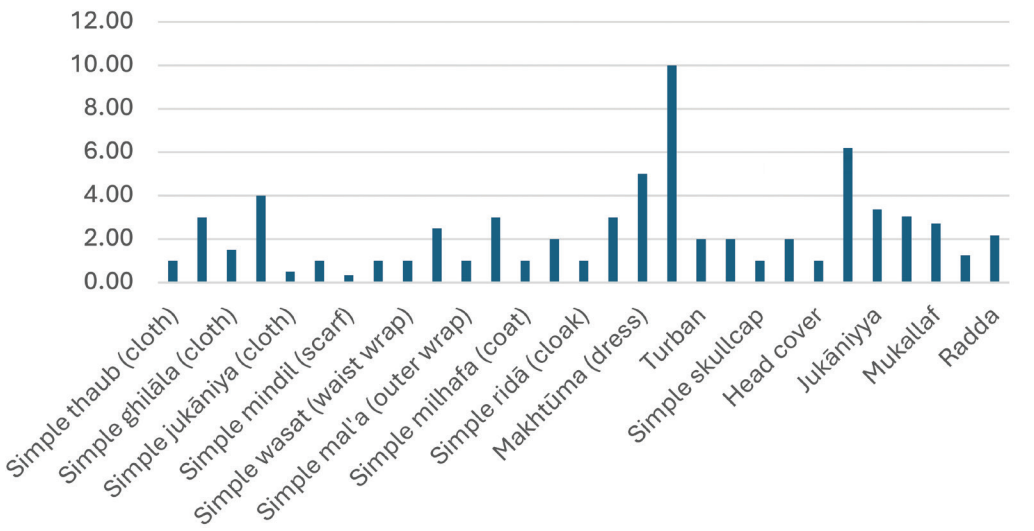


Figure 1.3. Average prices of clothing items in Egypt, eleventh–thirteenth centuries.

35 Ashtor, *Histoire des prix*, 173; Goitein, *Mediterranean Society*, 229.

36 Goitein, *Mediterranean Society*, 127–30; Shatzmiller, *Labour*, 347–69. Compare England's sixteenth to eighteenth centuries: Cipolla, *Before the Industrial Revolution*, 72–73; Muldrew, "'Th'ancient Distaff.'"

37 Shatzmiller, *Her Day in Court*.

cultivation of textile plants and expansion of the textile industry responded to a rise in demand for luxury items (or, in economic jargon, "income-elastic" items) by people earning above the subsistence level, and not only in Baghdad and Fustat.[38] Commercialization of the industry followed these changes in the ninth century, a development we became aware of from contracts signed between weavers in the countryside and merchants in the Egyptian Fayyum.[39] Expansion in the cultivation of textile plants provided additional stimulus, which permitted the reorganization of linen production geared for export markets.

The rising demand for cloth and garments was not the only factor in the expansion of the markets—it was also fed by growing manufacturing capacities in the provinces. For instance, the first Abbasid list of taxes from 785 names various garments and carpets sent from the provinces to the capital as a share of taxes due, a sign of a lively textile industry in the provinces:[40] "300 checkered garments from Sijistan, 27,000 garments from Khurasan, 600 Tabaristân carpets, 200 robes, 500 garments, 300 napkins, 20 robes from Jilan, 20 embroidered carpets, 20 variegated cloths from Armenia, 120 carpets from Ifriqiya." While received as taxes, the textiles may have been sold in the markets and thus represent both demand and income. The Cairo Geniza documents show that in the eleventh century Egypt's flax was traded over new commercial arteries in North Africa, Sicily, Syria, and India.[41] New markets were inaugurated in response to growing demand, bringing improvements in financial institutions, written contracts, and increases in literacy and numeracy. The countless letters exchanged over the trade routes by the Geniza traders reveal the new dimensions of the economy's commercialization.

To sum up, growth in the textile industry occurred because of changes in various input factors. First, there was an increase in the supply of raw materials because of the amplified cultivation of textile plants—cotton and flax; second, there was an increase in demand for fine textiles as a result of rising incomes in the early period;[42] and third, the entry of women (and children) into textile production increased the size of the labor force. Together, these factors—a rise in demand, income elasticity and income distribution, an upsurge in the labor force, and the expansion of textile-plant cultivation and raw materials—may be unique to the textile industry and not representative of the whole economy, yet it justifies and provides a rationale for the claim made here of an intensive expansion of the markets. The extensive division of labor in the service sector provides additional evidence.

DIVISION OF LABOR IN THE SERVICE SECTOR

The division of labor in the service sector revealed by occupational classification offers more links to urbanization, transportation, trade, and human capital that supported the division of labor through the extension of the markets.[43]

38 Bulliet, *Cotton, Climate, and Camels*; Frantz-Murphy, "New Interpretation"; Shatzmiller, "Adoption of Paper"; cf. Cipolla, *Before the Industrial Revolution*, 3–63.

39 Rāgib, *Marchands*.

40 Ibn Khaldun, *Muqaddimah*, 1:362–63.

41 Goitein and Friedman, *India Traders*; Margariti, *Aden and the Indian Ocean Trade*.

42 Pamuk and Shatzmiller, "Plagues, Wages, and Economic Change."

43 Persson and Sharp, *Economic History*, 28–29, 33.

Table 1.4. Number of occupations (cases) in the service sector, by type.

	Number of unique occupations (cases)	
Type	**8th–11th centuries**	**12th–15th centuries**
Industrial services	262 (361)	243 (350)
Professional services	144 (214)	162 (252)
Public services	127 (161)	481 (573)

Source: Shatzmiller, *Labour*, 257.

Our database contains 522 unique occupations for the first period and 883 for the second. Table 1.4 presents the results of occupational classification in the service sector in three categories; occupations were divided into three types, then into six branches, with each one providing a different kind of service. In the industrial service category, 262 occupations were related to commerce and transport, 144 to professional services, and 127 to public services mostly representing activities in state institutions. In the second period, the division of labor increased and its focus changed. Specialization in service occupations was already considerable during the early period in the Middle East (eighth to eleventh centuries) and increased further (by 69 percent) in the second period. The number of unique occupations in industrial services, commerce, and transport declined, but unique occupations in professional and especially public services increased, so that their share of the labor force in services increased from 51 percent in the first period to 66 percent in the second. The increase in professional and public occupations improved trade and market transactions and administrative services, as well as the work of the courts when enforcement was required. All were the results of overall improvements in the quality of human capital.[44] These improvements included, for instance, the expansion of national bureaucracies of the Mamluk regime in Syria and Egypt and of the Marinid regime in Morocco. They reflect, in turn, an increase in literate and numerate personnel.

URBANIZATION, OVERLAND TRANSPORT, AND CAPITAL ALLOCATION

Studies of the urbanization patterns in the Middle East have determined that urbanization expanded there after the end of the Justinianic plague and the arrival of Arabs from the Arabian Peninsula. But comparative urbanization rates indicate that Islamic urbanization exceeded urbanization rates in the Roman period and in contemporary Europe, and that cities in the Middle East were larger than European cities.[45] The statistical approximation displayed in figure 1.4 demonstrates the case especially for Iraq.[46] However, in addition to

44 For a detailed discussion of the distribution of the labor force in the service sector, see Shatzmiller, *Labour*, 255–323. There is no room here to expand on the various reasons for these improvements, which include indicators ranging from literacy and numeracy to manuals and transaction technology.

45 Bairoch, *Cities and Economic Development*, 370–78; Bosker, Buringh, and van Zanden, "From Baghdad to London"; Ennahid, *Political Economy*.

46 Bosker, Buringh, and van Zanden, "From Baghdad to London."

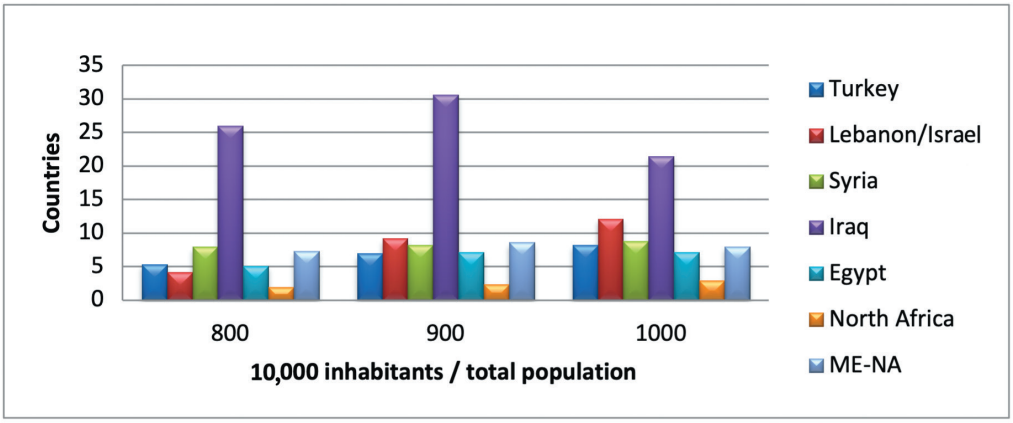


Figure 1.4. Urbanization rates in Middle Eastern countries between 800 and 1000. Data from Bosker, Buringh and van Zanden, "From Baghdad to London," 1418–37.

the expansion in urbanization in the Middle East, a process of commercialization of labor markets also took place, as demonstrated by market specialization in cities along the trade routes. But before looking at the evidence, some caveats need to be mentioned. Advocates of Smithian growth theory and division of labor point out that the greater the intervening distance between towns or between center and periphery, the smaller the trade between them and the smaller the number of people employed in producing exchangeable goods.[47] As a result, with each town occupied with producing self-sufficiency items and not benefiting from items produced elsewhere, the division of labor will not expand. It must be recalled that Adam Smith related bilateral trade volumes to each economy's size and distance from others, thus integrating trade volumes into his growth theory.[48] In the Islamic case, the relationship between smaller towns connected by interregional trade routes to large urban centers in the Middle East shows that they achieved a great degree of specialization in manufacturing. We can use as evidence the genre of Arabic sources known as the "Routes and Kingdoms" (*al-masālik wa'l-mamālik*), which describe the long-distance trade routes linking the empire and its provinces. Muḥammad ibn Aḥmad al-Muqaddasī, a tenth-century geographer, recorded the names of towns established along the northeastern trade route and carefully noted their production and exports, some of them second-hand but most locally manufactured.[49] List 2 in the appendix provides a sample of these northeastern towns and their specialties, an indicator of specialized urban markets, and how they coalesced into a network of trading communities.

The Middle East was also unique in its heavy reliance on overland transportation rather than on maritime shipments. Robert S. Lopez's vision of a commercial revolution in the thirteenth century was centered on maritime transportation and shaped our view of what medieval trade could bring to economic growth.[50] Overland routes are more expensive, entailing heavy costs for animals, beasts and their drivers, porters, and desert

47 Persson and Sharp, *Economic History*, 35–36.

48 Elmslie, "Retrospectives."

49 Muqaddasī, *Best Divisions*.

50 Lopez, *Commercial Revolution*.

navigators and requiring the crossing of rivers. Nonetheless, Herman Van der Wee and Theo Peeters have shown that while the twelfth, thirteenth, and sixteenth centuries were indeed periods of global economic expansion, they coincided with prosperous transcontinental European commerce. Conversely, the fourteenth and fifteenth centuries, as well as much of the seventeenth century, saw the intensification of maritime expansion but also of economic regression characterized by retreat, recession, or decline of transcontinental European trade.[51] Thus a different view of overland transport and its impact on the "extent of the markets" interprets what is normally taken to be a limitation—overland trade—as, instead, an economic driver. The cities situated on the Islamic trade routes experienced the same trend.

Finally, the ultimate condition required for the expansion of the markets was sufficient monetization, and in this respect no medieval economy can compare with the Islamic case.[52] The Islamic administration's early efforts to monetize the economy by setting up a unified monetary system, beginning with the Umayyads in the seventh century and continuing with the Abbasids in Baghdad, was later to be maintained by successor states in the different provinces. It is a testimony to the efficiency of the monetary system that it was kept long-term.[53] Independence from Baghdad permitted each region to mint its own coins and explore the mines within its borders while keeping the initial structures in place. One of the better-known episodes of a successful monetary system is that of the Samanids, known in the literature because of coins unearthed in Scandinavia—millions of silver dirhams acquired in trade deals by the Vikings.[54] The Viking dirhams, Samanid dirhams produced in northeastern Iran that were buried in hoards, have been used to construct a large database. Table 1.5 provides an overview of the amounts of silver dirhams traded north.[55]

The hoards were found along Russian rivers leading to northern Europe, thus backing the reports in literary sources about an intensive exchange occurring along regional and international trade routes that continued uninterruptedly for 200 years between the ninth and the eleventh centuries. The hoards provide confirmation of and information about the long-distance overland trade, its monetization, and markets. They also establish the existence of a silver-trading zone as a characteristic of the intensive and expandng markets on the northeastern route.[56] The monetization of the markets there was based on an unparalleled availability of silver and on the specialization and division of labor, including in mining occupations. A corresponding trade movement based solely on gold unfolded at the same time in the Mediterranean, one that combined the Saharan overland routes for gold and maritime transport for manufactured goods.[57] The import of Islamic gold from North Africa, which created the Mediterranean gold zone, incorporated southern Europe, North Africa, and Egypt, as did the silver incorporating northern Europe and Islamic

51 Van der Wee and Peeters, "Un modèle dynamique."

52 Persson and Sharp, *Economic History*, 33–35.

53 Shatzmiller, "Prices and Price Formation."

54 Noonan, "Volga Bulghāria's Tenth-Century Trade."

55 Kovalev and Kaelin, "Circulation of Arab Silver."

56 Shatzmiller, "Role of Money."

57 Shatzmiller, "Islam and the 'Great Divergence.'"

Table 1.5. Number of dirhams in hoards.

7th century	8th century	9th century	10th century	11th century
158	16,640	66,946	183,116	62,027

Source: Kovalev and Kaelin, "Circulation of Arab Silver," 560–80.

Central Asia.[58] The link between urbanization, trade, and monetization is provided by archaeological excavations that have unearthed mining towns with shops, markets, schools, mosques, and manufacturing facilities to supply the needs of the population. However, as table 1.6 suggests, the contraction in commercial and transport occupation types may reflect a vulnerability in the Smithian growth model when it comes to the transportation branch in the Middle East.[59]

Saving on transport costs was a concern for Muslim traders who managed to have the point of exchange closer to their location inside the Islamic territories or very close to the border. To save on transportation costs, including those for animals, people, and subsistence, traders also arranged to have their needed dirhams minted in the mines rather than procuring them from the government mint in the capital. The central administration showed a keen understanding of their needs and promptly shipped the dies to the mines. The intensity and rapidity of the exchange is confirmed by the speed with which dirhams arrived in northern Europe after only the shortest intervals of time after being struck in the mines.

CONCLUSION

In contrast to what would be expected of medieval sources, the evidence provided by medieval Arabic sources on the division of labor was more than just adequate. It enabled occupational classification in employment sectors to be conducted with statistical outcomes similar to those achieved by the same methodology applied to European cities of the sixteenth and seventeenth centuries. Our sources enabled us to conduct a study of occupations in employment sectors and to substantiate the statement that specialization and the division of labor were common in the manufacturing and service sectors. The discovery of a well-developed division of labor encouraged us to look for other structural changes in the economy that would have sustained it and to suggest how these structural changes

58 Spufford, *Money and Its Use*, 163–86; Watson, "Back to Gold." The Swedish numismatist Gert Rispling confirmed in a private communication (September 10, 2007) that the northeastern regions of both Europe and Islam show a total lack of gold currency in circulation during the period under consideration. He said, "The gold [that] tourists admire in the Museum of National Antiquities in Stockholm is mainly pre-Viking age and post-Viking age," an observation that confirms the dominance of Islamic silver in the local economy. The Islamic-type imitations in gold from Europe are centered on western Europe and hardly came to the north. He is also unaware of any imitation coin in gold coming from the west via Russia, whereas the reverse is common.

59 For a detailed analysis of the decline in commercial and transport occupations, see Shatzmiller, *Labour*, 259–75.

Table 1.6. Number of occupations (cases) in industrial services.

Occupations	Number of occupations (cases)	
	8th–11th centuries	12th–15th centuries
Commerce	232 (318)	220 (314)
Transportation	30 (43)	25 (36)

were related to an early episode of Smithian growth in the medieval Islamic Middle East. High urbanization rates, intensive monetization, specialized production along trade routes, commercialization, and human capital were put in evidence to fulfill the Smithian requirements of aggregate demand and the extension of markets needed to corrolate it with division of labor in economic development.

We were able to show the presence of agglomeration effects by extending our sources to include cities of various sizes across the Islamic Mediterranean and by recording the frequency with which a particular trade name appeared in all the sources. By extending our coverage over seven centuries, we could conclude that the degree of division of labor observed in the manufacturing and service sectors was long-term, widespread, and common. The findings thus suggest an efficient process in operation across the Middle East, Spain, and North Africa, standardizations through which manufacturing techniques could be efficiently diffused. Thanks to the spread of literacy and human capital, but equally through trade and commerce that linked commercial centers, a rise in productivity in the agrarian sector occurred as well.

The case of the Middle East offers clues to answering some questions frequently asked about the process of Smithian growth. Authors question the dynamics of the process—for instance, what is the "takeoff point" of Smithian growth? How, why, and at what stage did the process of the division of labor begin? In what order did economic changes initiate the process? When do small markets with limited division of labor coalesce into an extensive division of labor and economic growth? Until more research is done, the Middle East case highlights one factor above all: the accumulation of capital, both human and financial, which grew productivity. The impact of the early availability of money—namely, the presence of financial capital expressed in monetization, liquidity, and the velocity and dimensions of the money supply—demonstrates how the productivity of financial capital grew in the Islamic economy and and that it was more substantial and occurred at an earlier stage than in Europe, thereby greatly enhancing the efficiency of the markets. Most importantly, however, the evidence examined here reminds us that an exogenous event, the Justinianic plague, was a trigger point of economic development, but that endogenous factors enabled the structural change that were essential to the process.

APPENDIX

LIST 1: OCCUPATIONAL DISTRIBUTION OF TEXTILE PRODUCTION

Button Maker, Female Lace Maker, Maker of Turbans, Seller of Turbans, Rope Maker, Rope Seller, Hemp Worker, Maker of Silk Head Veil and Sturdy Turbans, Felt Maker, Skirt Maker, Button/Tassel Maker, Sheer Maker, Maker of Tight-Sleeved Coats, Maker of Hats, Seller of Hats, Maker of Shrouds, Seller of Shrouds, Maker of Bed Coverings, Seller of Bed Coverings, Purple Dye Maker, Purple Dye Seller, Maker of Women's Veils/Covers for Animals' Eyes, Seller of Women's Veils/Covers For Animals' Eyes, Maker of "Batt" Garments (Pieces of Rough, Square, and Usually Green Cloth), Seller of "Batt" Garments (Pieces of Rough, Square, and Usually Green Cloth), Maker of Tall Headgear, Seller of Tall Headgear, Maker of Large Carpet, Seller of Large Carpet, Beater of Cloths, Maker of Caps, Seller of Caps, Maker of Silk Brocade, Seller of Silk Brocade, Maker of Cereal Bags, Seller of Cereal Bags, Maker of Socks and Stockings, Seller of Socks and Stockings, Cloak Maker, Seller of Woolen Broadcloth, Maker of Garment/Veil, Dyer Using Lapis-Lazuli, Weaver, Weaver of Headgear, Weaver of Lining Materials, Carpet Weaver, Weaver of Aprons and Silk Fabric for Headgear and Belts, Silk Weaver, Flax Weaver, Weaver of Sacks and Tents from Canvas, Weaver of Cloths with Fur, Weaver of Cotton, Weaver of Delicate Cotton, Quilt Weaver, Towel Weaver, Wool Weaver, Weaver of Fabric from the Village of ʿAkraba near Damascus, Weaver of Loin Cloths, Braider, Maker of Rope Soles for Light Footwear, Carder, Silk Merchant, Maker of Silk Cloth, Seller of Silk Cloth, Silk Dyer, Silk Weaver, Dress Liner, Silken Shawl Maker, Headgear Maker, Headgear Seller, Maker of Cloth Caps, Seller of Cloth Caps, Children's Blanket Maker, Maker of Pads Carried on the Back by Porters (or Used to Expand Dough), Maker of Soft Garments, Seller of Soft Garments, Fuller, Bleacher, Laundryman, Laundryman Who Bleaches the Laundry, Cutter, Maker of Cutting Instruments, Flax Manufacturer, Flax Seller, Flax Spinner, Flax Comber, Cotton Spinner, Cotton Seller, Cotton Manufacturer, Cotton Carder, Kerchief Maker, Kazz Silk Maker, Kazz Silk Weaver, Kazz Silk Seller, Low-Grade Flax Weaver, Low-Grade Flax Seller, Dyer, Tailor, Teamster, Female Dressmaker, Coat Maker, Coat Seller, Maker of White Linen Cloth Made in Egypt, Seller of White Linen Cloth Made in Egypt, Dyer Who Uses Crimson, Crimson Dye Maker, Felt Maker, Felt Seller, Maker of Felt Hair (or Wool Mingled and Compacted Together), Maker of Quilts and Quilted Garments, Maker of Women's Scarves, Maker of Women's Head-Veil (Made of Silk or Linen), Seller of Women's Head-Veil (Made of Silk or Linen), Fan Maker, Flax Comber, Maker of Belts, Maker of Women's Veils, Seller of Women's Veils, Clothes Presser, Peeler of Silk, Dyer Who Uses Vermilion, Maker of Vermilion, Embroiderer, Dyer Who Uses Oxidized Copper, Wool Carder, Cotton Carder, Mattress Maker, Carder, Maker of Cushions/Beds, Unraveller (of Raw Silk), Maker of Coats of Mail, Garment Mender, Embroiderer of Garment, Maker of Garment, Seller of Garment, Female Embroiderer, Garment and Leather Dyer, Textile Dyer, Dyer of Silk and Yarn, Silk Cloth Maker, Silk Cloth Seller, Dyer Who Uses Sumac, Silk Producer, Manufacturer of Blue Cloth (for Uniforms), Manufacturer of Ribbon/Cord/String, Maker of Veil, Maker of Underclothing, Seller of Underclothing, Maker of Wool and Woolen Garments, Maker of Halters Made of Hair, Seller of Halters Made of Hair, Maker of Mamluk Hats, Tassel Maker, Maker of Baghdadi Cloth, Maker of Curtains/Veils/Screens, Maker of Carpets/Mats, Seller of Carpets/Mats, Female

Embroiderer, Female Bonnet Maker, Maker of Wool Article (Worn by Persians or Foreigners), Seller of Wool Article (Worn by Persians or Foreigners), Maker of Turban/Cloth Made in Tustar, Seller of Turban/Cloth Made in Tustar, Dyer Who Uses Saffron, Downer, Embroiderer in Gold and Silver

Source: Shatzmiller, *Labour*, 118–23.

LIST 2: COMMODITIES PRODUCED IN THE TOWNS OF THE NORTHEAST

". . . As regards merchandise the following was exported:
from ***Tirmidh***, soap and asafetida [a natural resin];
from ***Bukhara***, soft fabrics, prayer-carpets, woven fabrics for covering the floors of inns, copper lamps, Tabari tissues, horse girths (which are woven in places of detention), Ushmuni fabrics, grease, sheepskins, oil for anointing the head;
from ***Karminiya***, napkins;
from ***Dabusiya*** **and** ***Wadhar***, Wadhari fabrics, which are dyed in one color. I have heard that one of the sultans of Baghdad called them the satin of Khurasan.
From ***Rabinjan***, winter cloaks of red felt, prayer carpets, pewter ware, skins, strong hemp, and sulphur;
from ***Khorezmia***, sables, miniver, ermines, and the fur of steppe foxes, martens, foxes, beavers, spotted hares, and goats; also wax, arrows, birch bark, high fur caps, fish glue, fish [walrus] teeth, castoreum, amber, prepared horse hides, honey, hazelnuts, falcons, swords, armor, khalanj wood [birchwood], Slavonic slaves, sheep, and cattle. All these came from Bulghar, but Khorezmia exported also grapes, many raisins, almond pastry, sesame, fabrics of striped cloth, carpets, blanket cloth, satin for royal gifts, coverings of mulham fabric, locks, Aranj fabrics, bows which only the strongest could bend, rakhbin (a kind of cheese), yeast, fish, boats (the latter also exported from ***Tirmidh***).
From ***Samarqand*** is exported silver-colored fabrics (simgun) and Samarqandi stuffs, large copper vessels, artistic goblets, tents, stirrups, bridle-heads and straps;
from ***Dizak***, fine kinds of wool and woollen clothes;
from ***Banakath***, Turkistan fabrics;
from ***Shash***, high saddles of horsehide, quiver, tents, hides (imported from the Turks and tanned), cloaks, praying carpets, leather capes, linseed, fine bows, needles of poor quality, cotton for export to the Turks, and scissors;
from ***Samarqand*** again, satin which is exported to the Turks, and red fabrics known by the name of mumarjal, Sinizi cloth, many silks and silken fabrics, hazel and other nuts;
from ***Farghana and Isfijab***, Turkish slaves, white fabrics, arms, swords, copper, iron;
from ***Taraz*** (Talas), goatskins;
from **Shalji**, silver;
from ***Turkistan***, horses and mules are driven to those places, and also from ***Khuttal***.
There is nothing to equal the meats of ***Bukhara***, and a kind of melon they have called ash-shaq (or ash-shaf), nor the bows of ***Khorezmia***, the porcelain of ***Shash***, and the paper of ***Samarqand***.

Source: Barthold, *Turkestan*, 235–36 (with minor adaptations).

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