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Islamic Real Wages, Demographic shock and Economic Performance in the Early Medieval Near East*

Introduction

In a study currently in progress, Sevket Pamuk and I propose to set the medieval Islamic Near East's economic performance in a comparative context by estimating the purchasing power of the daily wages earned through unskilled labour in Egypt and Iraq together with the GDP and the GDP per capita for Egypt, and comparing these results with those for the Roman Empire (150 CE), the Byzantine Empire (1000-1450), Ottoman Turkey (1480-1800) and southern and northwestern Europe (1300-1800). [1] I cannot present or discuss all the results here, but one key finding of the study lies in the relationship between demographic shock and economic performance, a subject which has recently been debated. The study revealed that daily wages for unskilled labour peaked in Egypt in the two periods following the two bubonic plagues, the Justinian and the Black Death. The first peak followed the Justinian plague (541) and its recurrences, in about 750, the second occurred in about 1480, in the afetmath of the Black Death (1348).[2] The data also allowed us to make a comparison with Iraq, showing that wages in Egypt and Iraq were high at about the same time, around 750. Those in Iraq declined somewhat afterwards reaching a low in 930, while those of Egypt remained almost the same, with only a slight decline in the tenth century. By the eleventh century the reverse occurred, with wages in Iraq rising while wages in Egypt declined. There appeared to be severe labor shortages in Egypt in the eighth to tenth century but not so in Iraq, a difference which needs to be explained. Before addressing these questions, however, a word on the sources is necessary.

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[1] Şevket Pamuk and Maya Shatzmiller, "Wages and GDP Per Capita in the Medieval Near East in Comparative Perspective, 300-1800," Forthcoming.

[2] Whether or not the Justinian plague was indeed a Bubonic plague see Robert Sallares, "Ecology, Evolution, and Epidemiology of Plague," in *Plague and the End of Antiquity. The Pandemic of 541-750*, Lester K. Little ed. (Cambridge, Cambridge University Press, 2007), pp. 231-290.

The numerical data for the early Islamic centuries come from two main categories of primary source, documents, papyri and *Geniza,* and Arab chroniclers. The papyri documents include Arabic papyri published by A. Grohmann in a series of publications between 1920-1956,[3] and data from the Arabic Papyrological Database at the University of Zurich.[4] The *Geniza* documents, again unique to Egypt, are Arabic documents written in Hebrew characters by members of the Jewish community and preserved in the synagogue of Fustāt/Cairo. They include a variety of literary texts, private correspondence and accounts, mainly covering the eleventh to the thirteenth century and found in S. D. Goitein's *Mediterranean Society.*[5]Ashtor included much of this data in his *Prix et salaries,* a collection of numerical data of all sorts accompanied by a chronological analysis and interpretation of the Islamic economy. [6] The data used for Iraq was entirely taken from Ashtor's *Prix et salaries,* verified and in some cases corrected. It was culled from a variety of Arabic literary sources, including chronicles, financial treatises and taxation manuals, *kutūb al-Kharādj,* as well as geographical works, known as *kutūb al-masālik wa'l-mamālik,* which were written in the ninth and tenth centuries. The chronicles used include those written by Muslim historians of Iraq such as al-Tabarī, Hilāl al-Sabī, Jahshiyārī, as well as sources written by local Christians. Unlike the situation in Egypt, there are no archival documents available for Iraq, but the chronicles of medieval Iraq are far richer and more abundant than those available for early Egypt, a combination resulting in a balanced coverage of the two regions during the early medieval period. On the whole, and in comparative terms, the quality and the quantity of data on prices and wages in the Middle East used in this study are much greater, more detailed and more abundant than the data used for other medieval societies.[7] For that reason we believe that our estimates of real daily wages, GDP and per capita GDP are more reliable and have lower margins of error**.**

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[3] In particular Adolf Grohmann, *Arabic papyri in the Egyptian library. (Cairo,* Egyptian Library Press, 1934) vol. VI. For a comprehensive view see P. M. Stijpesteijn, J. F. Oats and A. Kaplony, " Checklist of Arabic Papyri," *Bulletin of the American Society of Papyrologists* 42(2005), pp. 127-166.

[4] http://orientw.uzh.ch/apd/project.jsp

[5] *The Jewish communities of the Arab world as portrayed in the documents of the Cairo Geniza. Economic Foundations*, vol. 1, (University of California Press, 1967)

[6] *Histoire des prix et des salaires dans l'Orient Médiéval* (Paris, S.E.V.P.E.N., 1969)

[7] For relevant comparative studies see Branko Milanovich, " An Estimate of Average Income and Inequality in Byzantium Around the Year 1000*," Review of Income and Wealth* , Series 53, Number 3 (2006), pp. 449-470; Elio Lo Cascio and Paolo Malanima, " GDP in Pre-Modern Agrarian Economies (1-1820AD). A Revision of the Estimates," *Revista di Storia Economica*, 25/3(2009), pp. 387-415;Walter

(Graph) Purchasing Power of Unskilled Wages in the Near East in Egypt, Southern Iraq and Byzantium in Bare Bone Basket

The relationship between demographics, especially demographic growth and economic performance has been explored in the context of pre-modern societies in recent publications, thus offering a scholarly framework within which to interpret the Islamic case. The relationship of population, productivity and urbanization is one which economic historians of the Roman Empire have debated as well. Bowman and Wilson broached the topic in their introduction to a study of the Roman imperial economy, positting demography and urbanization as one of the key diagnostic areas for measuring the performance of the Roman economy.[8] They accepted the premise that there is a correlation between the enormous population increase in the Roman Empire, from 20m to 40m, and the growth in economic performance, but later question the reverse trend, asking whether shrinkage in population and changes in settlement patterns are necessarily indications of decreased prosperity. Elio Lo Cascio offered to differentiate between urban centers where the majority of manpower engaged in agriculture, 'agro-towns' as a solution for proper estimates of population size, rather than urbanization rates.[9] In the same volume, Willem Jongman, looking not at a demographic shock but at a continuous demographic decline resulting from the mortality caused by the unsanitary conditions in ancient Rome, doubts the initial premise, asking whether population growth in Rome stimulated the economy or rather depressed the rise in per capita income.[10] Findlay and Lundahl focus on the effect of a demographic exogenous shock to the economy and suggest a different and positive scenario, showing how a dramatic population decline stimulated economic growth. [11] By linking the population decline in the aftermath of the Justinian Plague, 541 A.D. to a wide array of changes,

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Scheidel,"Real Wages in Early Economies: Evidence for Living Standards from 1800 BC to 1300 CE," *JESHO* 53 (2010), pp. 425-462

[8] A. Bowman and A. Wilson eds. *Quantifying the Roman Economy, Methods and Problems*, (Oxford, Oxford University Press, 2009), 5-6.

[9] Elio Lo Cascio, "Urbanization as a Proxy of Demographic and Economic Growth," in *Quantifying the Roman Economy*, pp. 87-106.

[10] Willem Jongman, "Archeology, Demography, and Roman Economic Growth," in *Quantifying the Roman Economy*, pp. 115-126.

[11] Ronald Findlay and Mats Lundahl, "Demographic shocks and the Factor Proportions Model: From the Plague of Justinian to the Black Death," *Eli Heckscher, International Trade, and Economic History*, R. Findlay, R. Henriksson, H. Londgern and M. Lundahl eds. (Cambridge, Mass. MIT Press, 2006), pp. 157-198. Şevket Pamuk, "The Black Death and the Origins of the 'Great Divergence' across Europe, 1300-1600," *European Review of Economic History*, II (2007), pp. 289-317.

land and labour ratio, shrinking and expanding frontiers, productivity, Malthusian effect on consumption, etc. they point out that it was this particular demographic shock which was responsible for the economic rise of Western Europe in the pre-Black Death period. The model and argument were both inspired by work on the aftermath of the Black Death, suggesting that 'demographic shocks' are much more than the Malthusian equilibrium correcting and readjusting population size to economic resources with positive results.[12] Findlay and Lundahl extended the model to Byzantium and Islamic history, and highlighted the similarities.[13] The findings of the wage study referred to above offers opportunity to investigate the link between demographic events and circumstances, whether exogenous or endogenous, and economic performance on a solid historical basis.

How can we explain the fact that the purchasing power of wages and the labor shortages in Iraq were not as high as they were in Egypt ?To answer the question, I will examine the demographic conditions which encountered by the arriving Muslims and the strategies they developed to combat manpower shortages: censuses, forced settelements, slave purchasing, and the urban environment, all places where data on wages of unskilled labour were collected. Admittedly, this part of the paper may appear tidious and with too detailed, but it is nonetheless necessary for the reconstruction of the demographic conditions. In the seond part of the paper I will address the early performance of medieval Islamic economy by singling out key diagnostic areas where changes which are significant enough to be interpreted as proxies of economic growth. These are chnages in coinage and monetization, division of labour, and trade.

Demographic Conditions after the Justinian plague and Islamic Response

Findlay and Lundahl used the works of McEvedy and Jones, Issawi and Russell to arrive at population sizes in the aftermath of the Justinian plague, but these numbers are for the general population, and ignore regional variations, so we need to complete the numerical picture, by including these.[14] For Egypt, Russell estimated a population of 2.6m in 650 A.D. including 100,000 Muslim immigrants - a number he believed remained unchanged in the eighth and ninth centuries.[15] The lowest point in Egypt's population was in the tenth and the eleventh

[12] Findlay and Lundahl, 163-175
[13] Findlay and Lundahl, 180-185 for the Islamic world.
[14] Findlay and Lundahl,158-163.
[15] Josiah Cox Russell, "The Population of Medieval Egypt," *JARCE*, 5(1966), p. 72.

centuries, when it was slightly above 1.5million while an increase started in the twelfth, culminating in a new high in the middle of the thirteenth, before declining to a new low in the fourteenth century, and prior to the arrival of the Black Death.[16] Russell had doubts about demographic recovery in Egypt,[17] and cautioned that his population estimates, though based on taxation and not on density, do not correspond to the highs and lows of the Nile, which may have affected productivity and therefore do not take into account the situation in the rural areas.[18] McEvedy and Jones give a completely different picture of Egypt's population. Historically between 3million to 5million, it reached 3.75million at the time of the conquest with population growth occurring in the tenth century bringing it up to 5million.[19] "Egypt, which suffered from the "economic collapse of the 4th century AD and the plague of the 7th,"[20] was the only region in the Middle East where population growth occurred while the rest of the Middle East stagnated demographically. The population of Syria at the Arab conquest had fallen below 2m and continued to fall to 1,5 million after the move of the capital to Baghdad in 750 A.D. Adding Palestine to Syria, the combined region's population would reach 2.35million by 800 A.D. This number remained the norm for the next eight centuries.[21] Iran with a population of 5million at the time of the conquest had lost half a million by the year 1000.[22] As to Iraq, it reached 2.5million at the height of the Abbasid rule, around 800 A.D. and declining to 2million by the tenth century.[23] Islamic historians equally differ. The late Michael Dols also believed that the recurrences of the Justinian plague in the seventh and eighth centuries significantly retarded population growth and debilitated Muslim society in Syria and Iraq during the Umayyad period, 656-750 A.D.[24] On the other hand, some, for example Andrew Watson, believe there was a major population growth, in spite of what he calls "... ill-docuemented but nonetheless real demographic revolution which seems to have touched most parts of the Islamic world from

[16] Russell, "Medieval Egypt," 75.
[17] Russell, "Medieval Egypt," 73.
[18] Russell, "Medieval Egypt," 80. The unpublished dissertation of Richard S. Cooper, *Ibn Mammati's rules for the ministries. Translation with commentary of the "Qawanin al-Dawawin"* (Brekeley, 1973) will likely shed light on this period.
[19] Colin McEvedy and Richard Jones, *Atlas of World Population History*, (Penguin Books, 1978), 138.
[20] McEvedy & Jones, 226.
[21] McEvedy & Jones, 138.
[22] McEvedy & Jones, 152-154.
[23] McEvedy & Jones, 149-180.
[24] Michael Dols, "Plague in Early Islamic History," *Journal of the American Oriental Society*, Vol. 94, No. 3 (Jul. - Sep., 1974), pp. 371-383. Several pages are devoted to historiography of medical Arabic literature and the communal response developed to the full in Dols' book on the Black Death.

roughly the beginning of the eighth to the tenth century."[25] Pedro Chalmeta shared this view with regard to Spain. He contested the numbers of 3million-5million given by other demographers for the year 700, maintaining that the Spanish population for that date was more than 7million, and that extensive population growth between 822 and 950 meant it reached 10million by the middle of the tenth century.[26] It is now time to examine closely what happened during and after the conquest and mitigate the effect of a backdrop of confusion and disagreement.

The Islamic conquest of the Middle East is obviously crucial for understanding the impact of the Justinian plague and vice versa. Findlay and Lundahl relied on an outdated account of the Islamic conquest by J. J. Sauders, who complained about "the deficiency of the evidence at the historian disposal".[27] In the meanwhile the study of the conquest has progressed by leaps and bounds, and has been covered in great detail by historians such as Fred Donner,[28] Micael Morony[29] and, more recently Hugh Kennedy.[30] Thanks to them the demographic conditions encountered by the Muslims and their reaction to what they encountered, is better understood. Hugh Kennedy explained "although there is neither enough nor thorough archeological work on every village and city in Byzantine Syria, Egypt or Iraq to allow a definitive answer, the archeological evidence which is there is entirely consistent with a pandemic which caused a massive loss of life on repeated occasions, expansion of both urban and rural settlements came to an abrupt end after the middle of the sixth century, that housing start ceased."[31] The scenery may not have been completely unfamiliar - ruins and sparse human habitation were part of their very own ecology in Arabia, but soon enough Arabs came into contact with the recurrent plagues. Most of the conquest of the Near East took place during a lull in the plagues which lasted until 670**,** with one exception, the outbreak in Amwās in Syria in 638, that of, which killed 25.000 Muslim soldiers.[32] But even without the plague, population loss

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[25] Andrew M. Watson, *Agricultural Innovation in the Early Islamic World*, (Cambridge, Cambridge University Press, 1983), 129.
[26] Pedro Chalmeta, " An Approximate Picture of the Economy of al-Andalus," *The Legacy of Muslim Spain,* Salma Khadra Jayyusi ed. (Leiden, E. J. Brill, 1992), 755.
[27] Findlay and Lundahl, 180.
[28] Fred M. Donner, *The Early Islamic Conquests* (Princeton, Princeton University Press, 1981)
[29] Michael Morony, *Iraq after the Muslim Conquest* (Princeton, Princeton University Press, 1984)
[30] Hugh Kennedy, *The Great Arab Conquests. How the Spread of Islam Changed the World We Live In.* (Philadelphia, Da Capo Press, 2007)
[31] Hugh Kennedy, "Justinian plague in Syria and the Archeological Evidence," in *Plague and the End of Antiquity,* pp. 87-95.
[32] Dols, "Plague in Early Islamic History", 377.

continued. Casualties were suffered in battles, while the arrival of the Arabs also triggered flight of Christians. 30,000 Christian Arabs, the Banū Ghassān, migrated to Byzantium as well as 200,000 Greeks from the coastal cities of Sidon, Beirut, Byblos, Arka, Tripoli and Alexandria.[33] Population continued to decline, with plague outbreaks recorded in each of the regions of the newly constituted Empire: Egypt in 669, 673, 686, 688/689 and 699, Syria and Kūfa in 688/689, Basra in 706 with another outbreak in 716/717, Iraq and Syria in 717, Syria in 725-726 and 733/734, Syria and Iraq in 734-735, 744/745 in Basra and again in 749.[34] In fact Basra experienced so many plague recurrences that it became a literary center for writing on the plague.[35] The Syriac chroniclers from the Jazīra and Iraq confirm the count given by the Arabic chroniclers, reporting hundreds of thousands dead.[36] By the mid-eighth century population levels in both Iraq and Egypt had dwindled sufficiently to explain why wages in both regions rose substantially, as the wage study results show. The next stage of the graph, showing the divergent trajectory of wages will be explained by governmental decisions affecting the demographic conditions in each of Iraq and Egypt, which occurred during the conquest.

Migration and Settlement, 640-750

The colonization of the Near East requires an explanation of the provenance of manpower at the height of a major demographic shock: the Justinian plague and its recurrent outbursts. In fact at the time of the conquest demographic conditions in Arabia could not have been more different than in the rest of the Middle East. Exploring biographies of the Prophet's tribe, the Quraish, Ch. Pellat suggested that this tribe had a very high birth rate, resulting in an annual population growth of between 2.5% to 4% annual growth,[37] and McEvedy and Jones estimated that there was a population of 5million at the time of the Prophet, much greater than that of either Egypt or Iraq in the seventh century.[38] However, the real explanation lies in

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[33] E. Ashtor, *A social and economic history of the near east in the middle ages*,(Los Angeles, University of California Press, 1976),12-13. Ashtor also says that "many Persians left the country" as well during the invasion though it is not clear what is "many".

[34] Dols, "Plague in Early Islamic History," , 376-380.

[35] Lawrence Conrad, "Arabic Plague Chronologies and Treatises: Social and Historical Factors in the formation of a Literary Genre," *Studia Islamica*, 54(1981), pp. 51-93.

[36] Michael G. Morony. "'For Whom Does the Writer Write?' The First Bubonic Plague Pandemic According to Syriac Sources." *Plague and the End of Antiquity: The Pandemic of 541-750*, pp. 59-86.

[37] Charles Pellat "Peut-on connaître le taux de natalité au temps du prophet?" *JESHO,* 14/2 (1971), pp. 107-135.

[38] McEvedy& Jones, 146.

epidemiology, which ascribes the immunity of the nomads to ecological circumstances. Unlike city dwellers and villagers, nomads do not hoard, or carry with them loads of grain. Thus, they avoid the rats and their fleas, which are the transmitters of Bubonic plague.[39] The hoarding and storage of grains, where vast numbers of house rats live in proximity to people, facilitated the transmission of the plague. [40] Thanks to the absence of grain storage, the Bubonic Justinian plague as well as its recurrences, left the population of Arabia intact and free to grow. This immunity to the plague explains the size of the Muslim armies under Caliph Uthmān, 644-656, estimated at between50,000-300,000, which enabled him to quickly dispatch an army 35,000-40,000 strong to aid the conquest of Persia and Iraq.[41] The same reason explains the military defeats inflicted on very large armies by nomads during the Black Death, which so surprised contemporaries.[42]

In fact, Arab/Islamic colonization began well before the conquest was complete, taking place hand in hand with the advance of the troops, and directed from Mecca. The devastation in the Syria-Palestine region was probably greater than that in Egypt or Iraq but settlement was first directed to Iraq.[43] Muslim soldiers were ordered to settle in Iraq as early as 636 and immigrants from Arabia were directed to settle there during the 640s filling the new urban centers of Kūfa, Basra, Mawsil and other garrison cities.[44] In 645 the population of Kūfa is 80.000 while Basra's population was estimated as being 200,000. [45] In 644, soldiers from Arabia were ordered to settle in the coastal and interior cities of Syria- Palestine, motivated by land grants and gifts of

[39] Kenneth L. Gage and Michael Y. Kosoy, "Natural History of Plague: Perspectives from More than a Century of Research," *Annual Review of Entomology* (2005), pp. 505-28. I wish to thank Dr. Jeremy McNeil for bringing this publication to my attention.
[40] On the importance of grain storage see Introduction by R. van der Spek to the conference theme.
[41] Ashtor, *Economic*, 9-15
[42] Hence the defeat of the Moroccan army in Tunis in 1348. See Maya Shatzmiller, "Marīnid Fez-Global Order and the Quest for Empire," Keynote address to conference *The City of Fez in World History*, Al-Akhawayn University, Ifrane, Morocco, 2010. In Press
[43] Michael Morony, *Iraq after the Muslim Conquest*, 236-153.
[44] Information on the patterns and size of Arab settlement in Iraq-Iran is found in the following studies by Morony and Lapidus: Michael G. Morony, "Landholding in Seventh-Century Iraq: Late Sasanian and Early Islamic Petterns," *The Islamic Middle East, 700-1900. Studies in Economic and Social History*, Abraham L. Udovitch ed. (Princeton, Darwin Press, 1981), pp. 135-175; Ira M. Lapidus, "Arab Settlement and Economic Development of Iraq and Iran in the Age of the Umayyad and Early Abbasid Caliphs," *The Islamic Middle East*, pp. 177-208.
[45] "Muslim Arabs at first tended to concentrate in cities and towns", Morony, *Iraq*, 250.

houses.[46] In 670, arsenals and ship-building activities resumed in the port installations in Acre and were accompanied by the settlement of skilled workers. The Arab settlers were either soldiers or nomadic tribesmen, but the Umayyads also settled Persians as well as Jews and Slavonic people in the coastal cities. More than 50.000 Arabs were moved from Basra to Khurāsān shortly after the conquest.[47] Along the Byzantine frontier region known as the *thughūr,* the Umayyad administration continued the policy of settling Arab soldiers in garrisons, *ribāts*, frontier towns, closer to the Byzantine heartlands. [48] The first Muslim settlers in the *thughūr*,300 troops who settled north of Antioch arrived in 703. Women were encouraged to join their husbands and the Muslims imported several thousand water buffaloes from India in to facilitate plowing and dairy production. Settlers were attracted by fiscal incentives and the promise of being able to make efficient use of the local Christian subjects for labour. Being aware of the unsatisfactory demographic conditions in Syria-Palestine in particular, the Umayyad administration carried out censuses of the male populations in Syria and in Iraq. [49] Following the move of the Islamic administration from Mecca to Damascus, in 656, the *dīwān*, bureau responsible for land distribution began using surveys to carry out censuses of the population. Such censuses were conducted regularly, every 18 years at first, more frequently later. During the 90 years of Umayyad rule, 656-750 A.D. the administration conducted one survey of fugitives in Syria, three in Mesopotamia and one of fugitives in Iraq. By the time the Abbāsid administration was inaugurated in 750 A.D., settlement activities were decreasing. By 775 immigration was so brisk that the granting of land had to be discontinued. The population of Muslims, temporary raiders, campaigners and regular troops on the Byzantine frontier received regular stipends and land grants. It grew to 100,000, a number reflected in the increased military

[46] Amikam Elad, "The Coastal Cities of Palestine during the Early Middle Ages," *The Jerusalem Cathedra*, 2(1982), pp. 146-167, (in Hebrew). English translation *The Jerusalem Cathedra: Studies in History, Archaeology of the Land of Israel*, ed. by L. I. Levine, (Jerusalem-Detroit, 1982), vol. II, pp. 146-167. The major source for the information is the historian al-Balādhurī, d. 892 A.D., who wrote the history of the Islamic conquests, *Futūh al-Buldān* . His account is replete with references to empty cities and countryside and to attempts of settlements.

[47] André Wink, *Al-Hind. The making of the Indo-Islamic world*, (Leiden, E. J. Brill, 1991), vol.1, p. 111. Wink speaks of 50,000 Arab families but likely the reference is to individuals.

[48] Peter von Sivers, "Taxes and Trade in the ᶜAbbāsid *Thughūr*, 750-962/133-351," *JESHO*, 25/1(1982), pp. 71-99. The pattern of the *Ribāt* settlement is also known from Islamic Central Asia. See É. de la Vaissière, "Le Ribat d'Asie central, " in É. de la Vaissière ed. *Islamisation de l'Asie central*, Studia Iranica 39, (Paris, 2008), pp. 71-94.

[49] Wadad al-Qadi, "Population Census and land Surveys under the Umayyads (41-132/661-750), *Der Islam 83*(2008), pp. 341-416.

assaults against neighbouring localities. In 809 Constantinople was besieged by an army estimated at 100,000 men while Sicily and the Mediterranean shores experienced renewed attacks, counteracting military actions against Muslims on the Byzantine frontier.[50] Manpower conditions in Egypt were also dire at the time of the conquest, but were not as well remedied as they were in Iraq. During the first century of the Arab period, 641 to 776 A.D., the government tried to address the shortage of labour by returning fugitives to their villages and by forcing tenure to land on them.[51] Since the conditions did not improve, the administration began relocating Arabs from Syria to eastern Egypt in 727-728 A.D. which led to revolt against the tax collectors by the relocated Arabs In 745 A.D. The Syrian Arabs who had been resettled in Egypt revolted again in 784 A.D., and were quelled by an army sent from Syria, while in 802 A.D. a Turkish army had to be sent from Iraq to Egypt to deal with similar unrest.

Slaves

It is not clear whether or not the government was directly behind slave imports, even though there were reports that slaves/captives were living in the Caliphal court. In the beginning it may have been strongly motivated by the government but this involvement declined in later years, when the documents clearly indicate that it was in the hands of private citizens by then and had nothing to do with the armies. Captives were taken during the conquest wars but they did not remain slaves for long.[52] There were slaves in the armies who fought valiantly and were promised their freedom in the battle for Soghdia in the mid-8th century.[53] The information from al-Maqqari, a seventeenth century Moroccan historian, that conquerors of Spain led a train of 30,000 prisoners to Syria in 714 A.D. is doubtful, not only because of the logistics but also because Spain was severely impacted by the plague.[54] Berber female slaves who were sent to Baghdad after the conquest of North Africa, remained favorites throughout Muslim rule there

[50] Von Sivers, 75.
[51] G. Frantz-Murphy, "Land-Tenure in Egypt in the first Five Centuries of Islamic Rule (Seventh-twelfth Centuries AS) *Agriculture in Egypt. From Pharaonic to Modern Times*, (Oxford University Press,1999), pp. 237-266.
[52] "Many of them were later freed, becoming *mawali* of Arab tribes and entering the Islamic community as full members", Kennedy, *Great Arab Conquest*, 105
[53] Kennedy, *Great Arab Conquest*, 288
[54] Michael McCormick, *Origins of the European Economy. Communications and Commerce A.D. 300-900*, (Cambridge, Cambridge University Press, 2001), 745 note 7.

and became mothers to quite a few Caliphs. [55] The provenance, numbers and prices of slaves coming to the Islamic lands indicate that a massive import probably amounting to hundreds of thousands took place during the early centuries. Such a large slave trade could not have been based on local manpower. After the conquest came ended there would have had to be regular purchases of large numbers of slaves in order for the business to qualify as a 'slave trade'. In order to make a real impact on the manpower shortages in the Middle East, slaves had to be imported in very large numbers and therefore had to come from regions which have not been affected by the Justinian plague and its recurrences: Black Africa, Central Asia, and North-Eastern Europe. Measuring the long term impact of slaves on manpower availability is further complicated by two additional factors unique to the practice of slavery in Islam, the emancipation of a ' slave mother', *umm walad*, and her son, as well as the regular manumission of slaves at their owner's death, and military slavery.[56]

The study of the slave trade with sub-Saharan Africa reveals a regular, yearly supply of black slaves being imported into the Middle East, using a system which may have preceded the Islamic conquest. The recruitment of black soldiers into the Eastern armies may explain the numbers and military successes of the *Zanj* revolt which broke in 861A.D.[57] Austen estimated that following the Islamization of North Africa between 650 A.D. and 1500 the entire slave trade involved about 5 million slaves, with at least 2 million to 2.5 million captured directly from the regions bordering the Red Sea, and avoiding the "Western" road, via Sijilmasa and Fez, where it joined the gold trade route. [58] Some slaves were brought to the Mediterranean for sale, while others were sold in East African ports as the demand came mostly from the Near East. E. Savage concluded that in the eighth-tenth centuries, the Ibādī slave traders of Ifriqiya managed the slave export single handedly.[59] Black soldiers were common in the Islamic armies of North Africa,

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[55] Berber slave girls fetch 1000 gold dinars in the slave markets of the Middle East, Kennedy, *Great Arab Conquest*, 206. Mother of the first Abbasid Caliph al-Mansūr, 754-775, and Berber selling their sons as slaves, Kennedy, *Great Arab Conquest*, 214-215.

[56] On the effect of manumission on slavery in Rome, see Willem Jongman, "Slavery and the growth of Rome. The transformation of Italy in the second and first centuries BCE," *Rome the Cosmopolis*, C. Edwards and Greg Woolf eds. (Cambridge, Cambridge University Press, 2003), pp.100-122.

[57] Alexandre Popovic, *La révolte des esclaves en Iraq au IIIe/IX siècle (*Paris, Librairie Paul Geuthner, 1976)

[58] Ralph Austen, *African Economic Histor. Internal Development and External Dependency*, (James Curry, London, 1987), 59.

[59] Elizabeth Savage, *A Gateway to Hell, a Gateway to Paradise*, (Princeton, The Darwin Press, 1997), 67-89.

particularly in Ifriqiya where a series of ruling dynasties commonly employed servile black units. White Berbers enrolled in the Fātimid armies if the, arrived from North Africa and probably remained in Egypt but there is no indication that they were slaves. The Black slaves of the *Zanj* revolt fame arrived from East Africa across the Red Sea and were sold in the slave markets of Basra. The majority of those who arrived in the seventh-ninth century remained in Southern Iraq, working in the salt marshes behind Baghdad. African slaves also dominate the price lists of slave sold in Egypt. A list of slave prices from the ninth-twelfth century show that the slaves sold were almost exclusively females and Black, *nubiyyas,* although one or two white Berber females were also included. The origin of the slaves also demonstrates that the distance Black African slaves normally travelled was not extensive. The other region from which a large number of people came to the Caliphate was Central Asia, though not all these people came as slaves. The geographer al-Muqaddasi mentions that Kh^{w}ārazm (Khorezmia) was the point of entry of Slaves coming to Baghdad, and Farghana was the entry point for Turkish slaves.[60]The Turkish guard of the Abbasid court played a role in the civil wars of 815-889 A.D., but it was only partly composed of slaves. [61] Peter Golden drew a clear distinction between the Turks, who were slaves and destined for military service, arriving directly from the nomadic lands, and others, who were descended from Iranian ruling families, who were clearly not.[62] The 3,000-4,000 slaves in the Caliphal guard, which accompanied the Caliph to the new capital Sāmarā', were brought to Iraq from Transoxiana and the Caucasus, especially the Khazar lands. The great slave markets of the Caliphate were therefore Basra, Baghdad and Kh^{w}ārazm. [63]

The purchasing of European slaves deserves some detailed discussion because of its assumed role in the economic recovery of pre-modern Europe. The most detailed exploration of Western Europe slave trade with the Caliphate, both in terms of the documentation and in terms

[60] See below the al-Muqaddasi list.
[61] The story of the Turkish guard is told in Matthew S. Gordon, *The Breaking of a Thousand Swords. A History of the Turkish Military of Samarra (A.H. 200-275/815-889 C.E.)* (Albany, SUNY Press, 2001). In spite of the recent interest in the Turkish military slaves there has been little research into the economic dimensions of the phenomena, prices, numbers, organization, dynamics etc. See also Patricia Crone , *Slaves on Horses. The Evolution of the Islamic Polity* (Cambridge University Press, Cambridge, 1980); Daniel Pipes, *Slave Soldiers and Islam. The Genesis of a Military System* (Yale University Press, New Haven and London, 1981)
[62] P. B. Golden, "Khazar Turkic Ghulams in Caliphal Service," *Journal Asiatique* 292.1-2(2004), pp. 279-309.
[63] See entry *EI*^{2} (C. E. Bosworth)

of providing the economic context for its execution, is by Michael McCormick.[64] As a background to the slave trade, McCormick described the extensive economic exchange taking place between the Caliphate and Western Europe. In exchange for their 'oriental goods' the Muslims bought lumber, furs, arms and slaves from the Europeans, although McCormick has some difficulty in documenting it. He admits that there is no evidence for the shipment of lumber, [65] swords may well have been imported from Western Europe, although the evidence we have traces these to the Northeastern trade. However, so far as for the Muslims buying of furs from Western Europe is concerned, McCormick admits that "Fur is another matter." Indeed it is and here, we are on a very solid ground. There has never been any reference to furs coming to Baghdad except through the Northeastern trade with the Viking which is documented by literary sources, and evidenced by the millions of dirhams deposited along the Russian rivers. It is against all reason –and evidence- that Muslims would buy furs in Frankland, Italy, or even Byzantium when they enjoyed an efficient, intensive, shorter and cheaper exchange directly with the provider, the Rus Vikings and their intermediaries, Khazars and Bulgarians. The market, Baghdad, was a short distance from the entry point of furs at Kh^{w}ārazm on the Caspian Sea, compared to the long route from France or Germany. The taste for furs in the Caliphate may be seen as a result of increased purchasing power in the eighth century, but it is historically linked to the arrival of the Central Asian Turks in Baghdad, which reflected a change in consumer's tastes.[66] This does not mean that Byzantium and Constantinople did not import furs, or that Western Europeans did not enjoy Russian furs, only that merchants from the Caliphate would not have gone there to get them. As for the Jewish Radanite traders of Ibn Khurdādhbih, they may have sold castrated slaves but there is no evidence that they went to Kiev to get furs, or traded with the 'Rus', or carried with them the silver dirhams minted in Samarqand and Bukhara which paid for them.[67] Actually there is no evidence from Islamic sources that the Caliphate traded with Western Europe and no European goods or money were ever found in the Middle East.

Turning now to the slave trade with the Caliphate. According to McCormick *"coins and high-value goods entered the Frankish empire from the Arab world and, probably, Byzantine*

[64] McCormick, *Origins,* 733-777.
[65] McCormick agrees that Lombard's book, *The Golden Age of Islam*, where such claims were first made, suffers from lack of methodology. McCormick, *Origins*, 729-730 and note 2.
[66] On this point see more below.
[67] See entry *EI*^{2} (Charles Pellat)

worlds. Since there is not the slightest hint that precious metals flowed out of Europe, this leaves little doubt that Europe exported goods of high value to exchange for the eastern imports". [68] *"..The human ware of slaves, Europeans hunted and captured across the continent and exported to foreign clime. Not only was their value high….they transported themselves….and could be forced to carry additional wares…"*[69] Peter Spufford has another explanation. Unlike McCormick, he saw a major outflow of precious metals from Europe and in fact linked the disappearance of money in Europe in the ninth and tenth century to the cessation of slave exports to the Islamic lands. [70] According to him, slaves were paid for initially in gold coins of *mancus* fame, money which was used by nobles and churchmen to buy oriental goods, particularly spices, but also garments. When opportunities for capturing slaves ended and no slave export took place there was no payment of gold into Europe. When the gold ran out, payments were made in silver to the Muslims, this, too eventually ran out when the European silver mines became depleted.[71] As a result there was a decline in Europe's money supply, which triggered a considerable decline in the use of money and in the quantity of coin in circulation. Church silver hoarding and Scandinavian 'Danegeld' were only aggravating factors in the monetary depletion, resulting from the end of slave exports to the Muslim world. [72] Building on a similar logic G. Duby claimed that the Muslims' superior monetary power played a crucial role in bringing slavery to end slavery in Europe. He argued that it was neither the Church, nor the end of military raids on the margins of the Carolingian Empire; rather it was the constant demand for slaves coming from the Muslim world and their power to pay for them.[73] The abundance of European documentation on slaving and slave trade amassed by McCormick is admittedly overwhelming and therefore it is possible to suggest another explanation; that the slaves referred to in the European sources did not come from Western Europe. European demographic growth

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[68] McCormick, *Origins,* 729.
[69] McCormick, *Origins,* 733-734.
[70] For the demonetization of the rural economy in the ninth and tenth centuries, Peter Spufford, *Money and Its Use in Medieval Europe (*Cambridge, Cambridge University press, 1988), 60- 61.
[71] Spufford, *Money*, 55-73, on the slow revival of deniers' minting by Carolingian and post or sub-Carolingian mints, *Money*, 60.
[72] Spufford, *Money*, 61.
[73] George Duby, *The Early Growth of the European Economy, Warriors and Peasants from the seventh to the twelfth centuries*, tr. By H. Clarke, (London, 1974), 40. Pierre Bonnassie, *From Slavery to feudalism in South-Western Europe*, (Cambridge, Cambridge University Press, 1991), 1-60, summarizing and correcting M. Bloch thesis on the reasons for the disappearance of slavery in Europe. ; Bonnassie, 6-7, and on the role of the religion and the Church, 25-32.

did not begin before the middle of the tenth century in some places, not before the eleventh in others.[74] The newcomers might have come from Northeastern Europe, a region which was not affected by the plague.[75] What is described in the documents is actually a secondhand slave trade of Slavonic slaves coming from the North. Secondly, slaves did not go to Baghdad but to North Africa and Spain, and it is possible to trace them there in the Islamic sources. Slaves worked large *latifundias* in Ifriqiya/Tunisia in the ninth century,[76] and there were large number of slaves, estimated at either 3,750, 6087 or 13,750, in Cordoba by the beginning of the ninth century.[77] The existence of Slavic *Taifas,* Party Kings, or the city-states of eleventh century Spain can only be explained by an earlier major import of Slav slaves. The only reference to Slavonic slaves coming from Western Europe to the Middle East is included in the 'diplomatic' gift which Berta of Tuscany, the Carolingian princess, sent to the Abbasid caliph al-Muqtafī, where it is specified that the eunuchs and slave girls were Slavs.[78] The Slav/slave etymology which McCormick traced to the ninth century provides further testimony to slaves mostly found in the enslaving regions which stretched as far as to the Slav regions of North-Eastern Europe and confirmed by the term *Saqāliba,* slave/Slav, in the Islamic sources.[79] As to the calculations of slave prices in Europe showing that slaves were cheaper in Europe than in the Muslim world, we have no guarantee that Ashtor's prices were for European slaves and whether the specific slave markets under consideration actually received white slaves.[80] McCormick acknowledged that Ashtor had doubts whether Carolingian slaves were ever sold in the Caliphate. [81] However, the slave prices collected by Ashtor[82] and Ragib,[83] show stability over the centuries, including the ninth century, with a mean price of 20 dinars in medieval Egypt. Morrison and Cheynet noted the doubling of

[74] Findlay and Lundahl, 162,
[75]McCormick, *Origins*, p. 754. For recent scholarship on the subject see the papers by Stoclet, Kulikowski, Maddicot and Dooley in *Plague and the End of Antiquity. The Pandemic of 541-750*, pp. 135-230.
[76] Muhammad Talbi, "Law and the Economy in Ifrīqiya (Tunisia) in the Third Islamic Century: Agriculture and the Role of Slaves in the Country's Economy," in *The Islamic Middle East*, pp. 209-249.
[77] Josiah Cox Russell, *Late Ancient and Medieval Population*, Transactions of the American Philosophical Society, (Philadelphia, 1953) Vol. 48/3, 92.
[78] McCormick, *Origins,* 733, note 26.
[79] McCormick, *Origins*, 737, n. 44 and 738-740.
[80] Table 25.1 McCormick, *Origins,* 757
[81] McCormick, *Origins,* p.755 n. 104. The prices McCormick included in his comparative list of slave prices. 757, are taken from Ashtor's *Prix et salaires*.
[82] Ashtor, *Prix et salaires,* 88-89, 208-211.
[83] Yūsuf Rāgib, *Actes de vente d'esclaves et d'animaux d'Égypte médiévale,* I, (Cairo, Institut français d'archéologie orientale, *Cahier des Annales islamologiques,* 23, (2002).

slave prices across the Byzantine territories during the second half of the fourteenth century, and this may well also be the case in Mamluk Egypt.[84] Could the massive migration to southern Iraq and the equally massive slave imports from Africa, Central Asia and Northeastern Europe, affect urbanization patterns?

Urbanization Patterns

Historians of ancient Babylon would agree that the region's urbanization history is replete with forced movements of peoples. McEvedy and Jones note that in the seventh century BC Nineveh received a stream of captives and adventurers explaining the all-time high population of 2million in Iraq.[85] Closer to the Justinian plague, forced transfers of prisoners of war and captive populations took place on a regular basis between the Sasanid and Byzantine Empires.[86] But two factors in particular, distinguished southern Iraq's urbanization, the early Arab migration which targeted the new garrison cities, and the internal migration from the villages to the cities. Major events triggered migration as well, such as the foundation of Baghdad in 750A.D. Artisans and builders were recruited in Syria and elsewhere for the purpose of designing and constructing the different quarters and houses, resulting in an increase in manpower of around 100,000. A hundred years later, the building of the second capital city, Sāmarā', probably involved the same process. The court administration, soldiers, merchants, immigrants from other regions, was equally determinant factors behind the growth in population. From the moment of its foundation in 750 A. D. Baghdad grew considerably. Its large urban surface included royal palaces and gardens, which led Russell to doubt the density factor, estimating its population as never larger than 300.000.[87] Watson estimated a population of between 500,000 and 1million for Baghdad, and 400,000 to 600,000 each for Sāmārā', Kūfa and Basra.[88] Adams thought that both Baghdad and Sāmārā' were new cities of a quite unprecedented size which exceeded the entire built-up area during the Sassanian period. Their

[84] C. Morrison and J.- Cl. Cheynet, "Prices and Wages in the Byzantine World," *The Economic History of Byzantium*, A. Laiou ed. (Dumbarton Oaks, 2002), vol. 2, 847–50. A student at the University of Western Ontario is currently writing her Ph.D. under my supervision on manpower conditions in Egypt before and after the Black Death.
[85] McEvedy & Jones, *Atlas*,
[86] Michael G. Morony, "Population transfers between Sasanian Iran and the Byzantine empire," *La Persia e Bisanzio,* Atti dei convegni lincei 201. (Roma, Accademia Nazionale dei Lincei, 2004), pp. 161-179. To Michael Morony this was "…evidence that the demand for labour exceeded the supply….and that skilled artisans increased palace production and increased tax basis", 161-162
[87] Russell, *Ancient and Medieval Population*, 88- 89.
[88] Watson, *Agricultural,* 133

building and organization represent complexity, quantitative and qualitative advances, while their provisioning came from an immense agricultural hinterland. [89]

In comparison, contemporary Islamic cities in other regions did not fare as well. Russell compared Damascus to Baghdad, and concluded that Damascus failed to grow, or "failed to attract population". The area it occupied remained smaller than Antioch and Alexandria. The series of isolated desert palaces built by the Umayyad princes in the Jezira and Jordan during the 90 years of rule there indicated a wish to live elsewhere than in the capital. The coastal cities took time to develop. Maritime excursions were not launched against Byzantine lands and Western Europe from Acre, Cyprus and Egypt before the tenth century. Egypt did not fare better in terms of urbanization either. Russell pointed out that the area occupied by the city of Alexandria had been reduced by more than a half by 811 A.D. and attributed this to the wars with Byzantium.[90] As for Fustāt, which was founded in 643, until the middle of the ninth century it only covered 600 hectares, much smaller than Baghdad which was 3,600-4,000 hectares.[91] The population density at the center may have been 400 persons par hectare, about 28.000 inhabitants. By the end of the ninth century or beginning of the tenth, the population of Fustāt may have been 200,000 persons and by the eleventh century the entire population of the combined urban conglomeration of Fustāt-Cairo was not less than 300,000 persons. Beyond this question of density illustrating the urbanization rate, others, among them Elio Lo Cascio,[92] have argued that taking urbanization and the rise of industries as indications of population increase, is uncertain for the Islamic case, but both Watson and Bulliet have argued that they were. Bulliet suggested that the "coordinated growth of city-based textile production and marketing would have become one of the important factors contributing to the dramatic growth of urban population levels generally observed in the ninth and twelfth centuries". [93] However, if population movements from rural to urban areas occurred, one also needs to know about the existence of the next development, growing productivity in the countryside, and this is not always obvious. Indeed, Bulliet was challenged by the need to show that the "burgeoning urban

[89] Adams, *Land*, 98-99.
[90] Russell, "Medieval Egypt", 75.
[91] Gia Djandjgava, "Ways of estimating population numbers in medieval Islamic cities as exemplified I the case of Fustat Cairo," *Al-Masāq* 5(1992), pp. 65-69
[92] Lo Casio, "Urabanization as proxy,"
[93] Richard Bulliet, *Cotton, Climate, and Camels in Early Islamic Iran. A Moment in World History*. (New York, Columbia University Press, 2009)

population" was adequately fed when part of the agricultural labour force had shifted to non-food production during the cotton boom in Eastern Iran between the eighth and the tenth centuries. Bulliet suggested that there was indeed an imbalance between city size and rural food production and blamed food shortages for urban unrest.

Urbanization also means 'urbanization of people'. Rather than covering the entire cultural and literary productivity of Baghdadi urban society, during the so called 'Golden Age' I will restrict myself to evidence directly related to material and economic life. Baghdad produced the earliest and most diverse assortment of written professional manuals for technical, manual and intellectual labour to be used in the education of the labour force. Composed in the ninth and tenth centuries the Arabic manuals t instruct people how to perform highly sophisticated tasks from administrations to irrigation.[94] The first category of administrative manuals were those composed for the tax collectors and accountants in the Caliphal administration. The *kutūb al-kharādj*, books of the landtax accounting, which listed the State's revenue sources and developed standards for measuring, collecting and reporting of taxation.[95] Landowners and cultivators who were interested in improving productivity encouraged the study of Greek, Pahlevi and Syriac agricultural manuals, which were translated into Arabic. The translation of the agricultural manual *al-filāha al-nabatiyya*,[96] in Iraq, should not simply be considered as part of the general translation of Greek scientific works into Arabic, but also a work used in conjunction with increasing land productivity. Iraq was the first home for a variety of new plants described by Andrew Watson, but the new food plants found there also indicate that the peasants in Iraq switched from cultivating basic foods, such as cereals, to more sophisticated ones.[97] The cookery books composed in Baghdad in the tenth century show how the changes in consumers' tastes and income played a role in the introduction of the new plants by creating demand for their use in the new dishes. One such example of the growing demand for and evetually the commercialization of food plants, is what happened with the suger cane.[98] Interest in the culinary arts may have begun at the palace but manuscripts of cookery books were widely

[94] For list of sources on occupational terms and labour structures in the period, see Shatzmiller, *Labour in the Medieval Islamic World* (Leiden, E. J. Brill).
[95] See entry *Kharādj* EI2 (Cl. Cahen) contains a list of manuals
[96] "Ibn Wahyshiya" *EI*^{2} (T. Fahd). See also the *Filaha* texts project. http://www.filaha.org
[97] Watson, *Agricultural,* 99-102.
[98] See Mohamed Ourfelli, *Le Sucre. Production, commercialization et usages dans la Méditerranée medieval*, (Leiden, E. J. Brill, 2008)

available, and they are included in the bibliographies of Arabic literature and books compiled in 945 A.D. and 988 A. D.[99] The list of ingredients found in cookery books dating from the early Abbasid period included all the vegetables, fruits and aromatic herbs produced by local cultivators, although avoiding, clearly on purpose, such basic and simple ingredients such as beans and figs, confirm that the variety of ingredients included in the dishes were available in the markets, while improving financial means made it possible for many urbanites to procure them. The variety of imported ingredients is equally large, including spices from China, India, East Africa, pepper, ginger, cloves, cinnamon, cardamom, nutmeg etc.[100] As well, spices from the Abbasid court at the time of Harūn al-Rashīd, 785 A.D. were sent to Aachen.[101] Rising urban incomes are reflected in the extraordinary salaries of administrators and soldiers which altered tastes in clothing, creating and created a demand for the luxury imported goods, brocades, silks and furs from the North. New plants, agricultural productivity and imported ingredients also meant better nutrition and therefore better health, something manifested not only in the fancy and complicated dishes, but in the medical manuals. The gynaecology and Paediatrics manuals in particular, used in the training of physicians and midwives may be taken as proxies for better personal hygiene and public health, such as higher reproduction rates, lower child mortality, and eventually population growth.[102] The *hisba* manuals composed for the market inspection, address a growing demand demand for maintaining public health standards in the markets, as well as changing patterns of consumption. The strictly technical manuals and scientific technical works translated from Greek also document the development of the industrial arts,[103] while the complete picture of the education of the workforce will be rounded out with the section on specialization and division of labour in the manufacturing trades discussed below.

Agricultural Change and Rise in National and per capita income: Iraq and Egypt

The changes which followed on the hills of the demographic shock in both Egypt and Iraq were not identical, but both display a rise in per capita income with equally important

[99] Maxime Rodinson, "Recherches sur les documents arabes relatives a la cuisine," *Revue des Etudes Islamiques*, 1949, 97. Also A. J. Arberry, "A Baghdadi Cookery-Book," *Islamic Culture,* 13(1939), pp. 21-47, 189-214.
[100] Rodinson, 145-146.
[101] McCormick, *Origins*, 710.
[102] Maya Shatzmiller, *Her Day in Court. Women's property Rights in Fifteenth Century Granada* (Cambridge, Harvard University Press, 2007), 107-117.
[103] Ahamd al-Hassan and Donald R. Hill, *Islamic Technology. An Illustrated History*, (Cambridge, Cambridge University Press, 1986)

consequences. The most reasonable explanation of what happened to agriculture in Iraq in the aftermath of the plague, and the rise in agricultural productivity and per capita income may be based on the archeological survey of long term settlements in Eastern and lower Iraq carried out by R. McCormick Adams.[104] He compared density of settlement patterns in both the rural and urban agglomerations of the Tigris river plains during a period stretching from 4000 BC to the nineteenth century A.D. What is crucial for the economic history of Iraq is what happened there during the Sassanian period, immediately predating the Islamic conquest. On the basis of the number of settlements dating from the Sassanid time, Adams concluded that the limits of agricultural cultivation already extended to the limits of cultivable land just before the Islamic conquest, with every portion of available land irrigated. He also found maximum urban expansion, with numerous new and old cities, although some signs of re-shuffled population and settled captives suggested that this resulted from a forced urbanization movement.[105] Until the early seventh century, 'the entire land surface must have been utilized for agriculture',[106] but the massive irrigation projects of the Sassanids expanded the capacity of the Tigris River to irrigate the area. By the law of diminishing returns the peasants who worked the lands at the extremities of the irrigated system, must have worked harder for limited results. That came to an end just before the Islamic period, when a substantial retraction was visible in both the extent of settlements and the density of occupation in corresponding to the Justinian plague. The Syriac chroniclers confirmed that the initial Justinian plague of 541 spread to Persia, and more occurrences were reported in lower Iraq in 628.[107] The slow decline from 580 until 628, and population numbers collapsing, further increased silt and salinity to the point that "At least half of the settled area was abandoned at the end of Sassanian period."[108] Cultivation of the regions at the outskirts of the irrigation system, land which was now saline and infertile, was abandoned. The survivors of the plague then moved to cultivate the fertile and better irrigated lands and Adams notes that for the next two or three centuries the agricultural system continued to function.[109] But Adams also reconstructed an impressive list of cities and small urban centers all

[104] Robert McCormick Adams, *Land Behind Baghdad*, (Chicago University Press, 1965)
[105] Adams, *Land*, 75,80-81
[106] Adams, *Land*, 74.
[107] Morony, " For whom," 63, 65,
[108] Adams, *Land*, 81.
[109] Adams, *Land*, 85.

of which experienced a cumulative growth during the first centuries of Islamic rule there.[110] Under the Muslims"…urbanization was carried to an unprecedented level. When we compare Baghdad and Sāmārā' either with earlier capitals or with the aggregate of all other contemporary settlement in the Diyala basin, we find a huge imbalance, a qualitative transformation in the character of the city and its institutions". [111]The improved demographic conditions affected mostly the urban centers, but agriculture productivity may have increased because the survivors of the plague could work the better, more fertile, land. The result was growth in national if not in per capita income.

Egypt displayed a different trend, again one perfectly supported by the patterns exhibited by the results of the wages study. As we saw earlier the urban centers took longer to develop there; instead, improvements in irrigation led to increased agricultural productivity and rising national and probably per capita income. Studying agricultural leases and tax receipts from Egypt, G. Frantz-Murphy skillfully linked the outcome of the intensive irrigation undertaken under the Abbasids in the eighth century to the industrialization of the countryside.[112] She convincingly shows how the rising income in the rural areas led by agricultural efficiency translated into higher taxes being collected in the hands of officials responsible for tax collection. Instead of sending taxes to the Abbasid treasury in Baghdad, the money collected remained in the hands of local tax collectors, who invested it in large scale flax cultivation and a weaving industry using the raw material produced on location.[113] The rise in the per capita income of tax collectors and merchants allowed investment in and commercialization of the textile industry which remained located in the countryside. A series of papyri detailing orders for cloth sent to the villages document the organization of the textile production and trade.[114] By paying wages to weavers living in the villages, tax officials contributed to raising standards of living in the villages.

Key diagnostic areas: Money and coinage, Trade and Division of Labour

Money supply, Mines, mints output, and monetization

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[110] Adams, *Land,* 89-97
[111] Adams, *Land,* 110
[112] Gladys Frantz-Murphy, *Arabic Agricultural Leases and Tax Receipts From Egypt 148-427 A.H./765-1035 A.D*. (Wien, 2001)
[113] Gladys Frantz-Murphy, "The Economic History of Medieval Egypt. The Role of the Textile Industry," *JESHO*, 24/3(1981), pp. 274-297.
[114] Yusuf Rāgib, *Marchands d'étoffes du Fayyoum au III^{e}/IX^{e} siècle*, (Cairo, 1982)

The evidence of an early and increased supply of money is currently the best tool for thematically linking structural changes in the Islamic economy. While Islamic monetary history is still awaiting even a basic level of economic analysis,[115] the quantity of coins available for study and their movement throughout the regions, the output of the mints and the velocity with which dirhams circulated is an indication of an early monetization of the economy. The hoards found on the Northeastern trade routes provide the largest quantity of coins dating from the tenth century but coins from the eighth and ninth centuries minted in places such as North Africa, and found in those hoards, suggest a wide ranging monetary circulation and monetization of trading transactions. The increased number of coins found in hoards is also supported by literary and archaeological evidence of increased activities in the mines and by the mints. Existing data indicate a significant rise in the number of mints, minting activities and mint production in almost every region during the first three centuries of Islamic rule. A full list of the active mines is available for reconstruction and calculations of the amount of metal extracted from central Asia, Morocco and Arabia can also be measured.[116] With the exception of Muslim Spain, all the other Islamic regions, North Africa, Egypt, Syria, Arabia, Iran, Iraq, Uzbekistan, Afghanistan, demonstrate a gradual but robust increase in money production and supply until the 'silver famine' of the eleventh century.[117] An increased money supply does not necessarily mean increased monetization; this has been demonstrated in the Islamic regions through the monetization of wages, taxes, commodities, and market transactions, in both the cities and the countryside. Recent work on army pay suggests that cash wages for soldiers were and remained the norm.[118] The very high wages paid to dignitaries, viziers, and army commanders, also confirm that very large amounts of specie were in circulation.[119] As with wages, taxes were reported in monetary units in the sources and, as with some of the wages, the tax amounts reported were very large. From the fact that they report both cash and kind, we may assume that

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[115] Andrew S. Ehrenkreutz, "Monetary Aspects of medieval Near Eastern economic History, " In *Studies in the economic History of the Middle East*, M. A. Cook, ed. (Oxford: Oxford University Press, 1970), pp. 37-50. Idem.,"Money" in *Handbuch der Orientalistik.* Leiden: E. J. Brill, 1977), pp. 84-97.
[116] Juri Burjakov, "L'extraction minière en Asie centrale aux VIIIe-XIe siècles de notre ère, " in *Islamisation de l'Asie central,* pp. 257-74, with detailed maps of regional mines done by Russian archeologists.
[117] Opinions diverge as what exactly were the causes of the silver famine.
[118] Hugh Kennedy, "Military Pay and the Economy of the Early Islamic State," *Institute of Historical Research* 75/188(2002), pp. 155-169.
[119] Ashtor, *Prix et salaires,*

specific commodities, such as textiles and candies were deliberately collected in kind and most probably shipped to the capital for immediate consumption in the court. We may therefore assume that markets were available to either the peasants or the tax collectors, to allow them to raise cash by selling agricultural produce. Flat rate taxes, the *jizya*, or the poll-tax, were always listed and paid in money. The provinces in the East initially had their taxes evaluated in silver money and paid their taxes in dirhams, while the regions in the Mediterranean basin had theirs estimated in gold and paid in dinars, until the mid-eighth century when the Abbasid budget listed taxes entirely in gold dinars only.

A dataset of commodity prices in different markets will make it possible to study market integration. This can also be studied by correlating exchange rates or the transaction costs over distances.[120] The minting facilities which were discovered during the excavation of the mines also demonstrate their role in urbanization.[121] The mines, which continued to function until the end of the eleventh century, attracted a considerable inflow of workers which in turn created a long-term demand for goods and services. Large quarters and family accommodations have surfaced in the archaeological digs, and also mosques, since the growing mining towns required religious services and educational establishments. The needs of the growing population of these mining towns had an impact on the surrounding agriculture as well, requiring supplies of food and animals. An expansion in agricultural cultivation and markets followed in the neighbouring regions. The growing demand for their product, namely bullion and coinage, led to an increase in the miners' incomes, a rise in per capita income which enabled them to purchase the imported luxury goods brought in by long distance trade. Using the velocity and size of the money supply, trade helped in the growing monetization of the connected areas, and in the development of both financial tools and credit instruments. The trade was based on the Islamic silver which created an international silver zone in which Islamic gold never appeared, as is shown in the hoards in Northeastern Europe, either Russia or Scandinavia. [122] Islamic coins became an equally

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[120] See David Kessler and Peter Temin, "Money and Prices in the early Roman Empire" in *The monetary systems of the Greeks and Romans*, W. V. Harris, ed. (Oxford, Oxford University Press, 2008), pp. 137-159.

[121] On the organization of mining and mining occupations, Shatzmiller, *Labour,* 175-176, 187-190.

[122] Andrew M. Watson, "Back to Gold- and Silver," *The Economic History Review* 20(1967), pp. 1-34. Spufford, *Money and its use*, 163-186. Gert Rispling in a private communication, 10 September, 2007, confirmed that the Northeastern regions of both Europe and Islam show a total lack of gold currency in circulation at the period under consideration. The gold tourists admire in the Museum of National Antiquities in Stockholm, is mainly pre-Viking age and post-Viking age, which confirms the dominance

important tool in the Islamic cultural colonization in the region. It was a no less impressive commercial revolution than the one in thirteenth century Europe. [123] Bringing together the evidence of coins and literary texts, we note the fact that there was a large amount of Islamic silver coins which circulated uninterruptedly for 200 years. The fact that these coins were transferred to Europe immediately after they were struck in the Islamic mints, that all the economies involved in the trade sooner or later proceeded to mint imitation or national coins based on the Islamic dirham points to an integration of the two economies producing, gathering, and supplying manufactured goods for each other and united by a common silver currency, the Islamic dirham. The European societies, which provided pelts, honey and slaves geared their economies to the regular and steady provision of these items to the customers in the Islamic caliphate in return for silver, swords and probably textiles. Muslim merchants made regular trips and maintained contact with the suppliers of these items but also managed to arrange that the point of exchange lay in their territories or very close by in order to avoid transportation costs. As for the credit tools, while credit operations in the international trade with Northeast Europe were not in evidence between the eighth-tenth centuries, credit transactions were fully operational in Baghdad, and the provinces, during those years. Credit institutions could not have developed in this section of the Islamic international trade, because the two trading economies were incompatible in terms of monetary development, institutions, or organization. By the same token that the Islamic gold from North Africa created a Mediterranean gold zone during the thirteenth century which incorporated southern Europe, North Africa and the Middle East. Islamic silver created a silver zone in which gold barely figured. It may or may not have been Islamic gold which enabled the *mancush*, but Islamic gold never appears in either Russia or Scandinavia during the period.

The Overland Trade: Two competing models for spatial integration

When it comes to trade, practically every component of the system was changed and transformed under Islamic rule, from commodities manufactured to means of transport,

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of the Islamic silver n the local economy. The Islamic type imitations in gold from Europe are centred on West Europe and hardly come to the North. He is also unaware of any imitation coin in gold coming from the West via Russia.

[123]Robert S. Lopez, *The Commercial Revolution of the Middle Ages 950-1350*, (Englewood Cliffs Prentice-Hall, 1971).

organizational, legal and financial tools, geographical space, and regional and international markets. The discovery of new markets and an alternative geographical spectrum offered the Islamic Empire and its regional components the opportunity to free themselves from the debilitating effect of the sluggish Mediterranean trade. The evidence of commodities being manufactured along the overland trade routes described in many works known as Routes and Kingdoms, *al-masalik wa'l-mamalik,* expose a network of Islamic producer cities connected by trade to each other and to the regional urban centers such as Baghdad and Basra. They added an extra dimension to the process of urbanization which took place along the overland trade routes, initiated and invigorated by trade. Here is the description of commodities travelling to Baghdad from cities in the Northeastern parts of the Caliphate, Khurasan and Transoxiana, in the tenth century:[124]

"...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, 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 teeth (walrus), castoreum, amber, prepared horse hides, honey, hazelnuts, falcons, swords, armour, khalanj wood (birchwood), Slavonic slaves, sheep and cattle. All these came from Bulghar, but khorezmia exported also grapes, many raisins, almond pastry, sesame, fabric of striped cloth, carpets, blankets 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 Samarqand stuffs, large copper vessels, artistic goblets, tents, stirrups, bridle-heads and straps,
from ***Dizak*** fine kinds of wool and woolen 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

[124] Al-Muqaddasī, *The Best Divisions for Knowledge of the Regions, a translation of Ahsan al-Taqasim fi ma'rifat al-Aqalim*, trans. B. A. Collins, (Reading, Garnet Publishing, 1994), 285-288.

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.***

With the growing size of caravans commercial transactions also became super-monetized, both in absolute terms and in comparison with previous and contemporary transactions. The new markets which opened in the new urban centers and the increased supply of coinage made profitable exchange more manageable. The suppliers of the international luxury goods, those whose economies were not monetized were anxious to increase the quantity of their goods to satisfy the demand. Evidence from trade is also a good indication of consumption habits and hence an indication of standards of living, but it raises the question of the maritime trade portion of the Islamic trade.

The historical evidence does not suggest that there was much maritime trade in the early centuries. There is no mention of a massive Red Sea trade in the pre-Geniza period and there is little or no evidence of Indian Ocean monetary circulation as no minted silver has surfaced in the port cities of the Persian Gulf, the Arabian coast and the Red Sea.[125] By the same token, the absence of manufacturing capacities around the water basins of the Red Sea or the Arabian Sea is an indication that no extensive urbanization could have occurred there. The areas surrounding the Arabian Peninsula lacked an agricultural hinterland and could only serve as depots for merchandise arriving and leaving from the port. Long caravan routes linked them to the interior in either Iraq or Persia. What may be observed in the Islamic case is more closely matched by the model proposed by Herman Van der Wee and Theo Peeters, [126] which traced a similar process of urbanization, market integration and increasing manufacturing capacities along the overland trade routes in Europe. While the European model is based on a larger chronological spectrum, it is nonetheless a more relevant model of the Islamic situation. During the eighth to the tenth

[125] John S. Deyell, *Living Without Silver. The Monetary History of Early Medieval North Indi.* (Delhi, Oxford University Press,1990)
[126] Herman Van der Wee, H. and Theo Peeters, "Un modèle économique de croissance interséculaire du commerce mondial (XIIe-XIIIe siècles)," *Annales, Économies, Sociétés, Civilisations* 25/1, pp. 100-128.

centuries, the intensive and regular trade bringing together Iraq, Iran, Central Asia and Northeastern Europe distinguish the Iraqi urbanization in comparison to Egypt.

Division of Labour

The manufacturing industry in the early Islamic economy was based on a high degree of division of labour, which was instrumental in the production of high quality items with a corresponding degree of sophistication efficiency and productivity.[127] Based on the numerical relationships between sectors and trade names I have concluded that the quantification of trade names as indicators of division of labour represents a reliable indicator for the degree of specialization in each of the categories and sectors analyzed. I was able to provide the relative size of the labour force engaged in each of the sectors and categories and document the changes in the structure of the manufacturing sector and its correlation to growth in productivity.

Number of Unique Occupations (Cases) in Sectors of Employment 8th-11th centuries

The occupational classification showed that a significant structural change took place within the manufacturing and services sector. The trade related occupations in the service sector returned 233 or so commerce-related occupations, which include only occupations associated with commercial and transport activities. These were trade names referring to merchants, sellers of raw materials grown, extracted or gathered in the countryside and brought unprocessed into the city, a large number of middlemen, differentiated according to their location in the markets, specialized commodities, keepers of inns and *funduqs* and an array of occupations in the financial services. The transport related occupations' share of the services was 12%.

The increase in manufactured goods is manifested by the changes in the division of labour and the specilization of the industries correspond to the evidence provided by the manuals.

Rational economic decisions

Making rational economic decisions should be viewed as a supporting structure in the process of economic growth.[128] Migration and settlement, sometime moving settlers by force from one region to another, offering them incentives in the form of land and payments, indicate

[127] I have discussed the rational behind the division of labour as indicator of growing productivity in Shatzmiller, *Labour*, 11-99.

[128] See discussion in Graeme Donald Snooks, "The dynamic Role of the Market in the Anglo-Norman and beyond, 1086-1300," in *A Commercialising Economy. England 1086 to c. 1300*, R Brittnel and B. Campbell eds. (Manchester, Manchester University Press, 1995), pp. 47-49

that we are looking at a comprehensive policy, a rational strategy devised by the pre-Umayyad and Umayyad administration to deal with the manpower shortages Muslims encountered everywhere in the Middle East, both rural and urban. Another good example of such a strategy in the Islamic economy is the way decisions on monetary policies and increased money supply were made and implemented. Acting upon the realization that a money supply was crucial for the economy the Umayyad administration took steps to resume minting as early as the seventh century. The government intervened to ensure that the mints right across the conquered regions did not shut down as a result of the conquest and effectively increased the number of mints in towns where they did not exist previously.[129] One may observe capitalistic features in the ways individual provinces and cities made use of their geographic advantages to develop an economic edge. One example was the Samanid development of the rich silver mines of Khwarazmia, forcing the Northeastern trade to pass through their territory.[130] Egyptian governments turned out to be adept participants in the Mediterranean-oriented economies, in spite of the loss of the wheat shipments to the market across the sea. Quick to transfer its economic edge from the wheat market to flax and manufactured linen Egyptian producers began shipments to Tunisia and Sicily. By the adoption of trading policies, techniques and tactics to supply the needs of the developing industries in the regional urban centres, the system contributed to the creation of a network of manufacturing cities along the overland routes. Using volume and size of the money supply, the velocity by which it was encouraged to circulate, whether cash revenue from taxes or exploiting the extremely rich precious metals resources, trade triggered the development of financial tools and credit instruments which deserve to be described as a special kind of a commercial revolution. Capitalism did not leave the Mediterranean with the end of the Roman Empire and capitalistic features were demonstrated to have existed in the development of manufacturing in the Islamic lands, with the resulting increase in commercialization and trade.[131]

Conclusion.

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[129] Alan Walmsley, "Coinage and the Economy of Syria-Palestine in the Seventh and Eighth Centuries CE," in *Money, Power and Politics in Early Islamic Syria. A Review of Current Debates*, John Haldon ed. (Farnham, Ashgate, 2010), p. 23: "…the remarkable feature of coin production in the 7th-8th centuries was the multiplication of towns that minted coins when compared to late Roman practices,".

[130] Al-Muqaddasi, 285.

[131] For details see Michael G. Morony, "Commerce in Early Islamic Iraq," *Asien Afrika Lateinamerika* 20(1993), pp. 699-720.

Wage calculations have shown that wages peaked around 750 A.D. in both Egypt and Iraq, in the aftermath of the Justinian plague. The validity of the link between wages and manpower scarcities was further confirmed by the second peak in wages occurring in the aftermath of the Black Death. This is in itself and by itself an important observation which ties the economies of the Middle East to those of Byzantium and Western Europe and justifies a comparative approach. The significance and the interpretation of these findings in the economic history of the regions are more complicated. Since there is no confirmation or agreement over population growth in the Islamic Near East in the first three centuries after the Justinian or subsequent plagues, (Russell, McEvedy-Jones, only assumptions (Issawi, Watson) a straight-forward recognition of the Findlay/Lundahl model as applicable to the Islamic case is not possible. However, the wages study also indicated a difference between Iraq and Egypt as both regions moved on to the next stage. Using a wide array of historical sources I have tried to use additional data which may account for an economic performance and argue that it was equally conducive to growth in both regions but at different times. I have shown that while urban unskilled wages were the same in both regions in the middle of the eighth century, conditions leading to the rise in national income and per capita income and a move to strong urbanization were already under way. In the course of the next two hundred years the economy of both regions developed differently. By showing that it is possible to account for growing agricultural productivity in Iraq in the aftermath of the plague and for population increase in the towns thanks to Arab migration and slave purchasing, it is possible to argue for a rise in per capita there well before it occurred in Egypt. In Egypt the change in agricultural efficiency did not materialize before middle of the ninth century and growing urbanization not before the middle of the tenth. However, growing per capita income there may account for the development of Egypt's textile industry and its commercialization, which aids urbanization. In Egypt, wages remained high during the ninth and tenth centuries, an indication of a lower urbanization rate, as no manpower movement to the cities is detected. The rise in per capita income led to the development of manufacturing in the rural areas. Wages in Egypt began to decline towards the end of the tenth century matching the rise in the urbanization rate symbolized by the foundation of Cairo. In that respect, the urbanization patterns in Egypt probably resemble more the 'agro-towns' suggested by Lo Cascio, than those of Iraq, as well as the rest of the Mediterranean. Finally, on a basis of a wide array of proxies as indicators of economic growth, it is possible to argue that the calculation

of wages contribute the necessary link to performance and population growth. This paper did not deal with institutions but it is possible to suggest that legal and religious institutions, particularly the law, provided stability to economic performance. The same cannot be said about the political institutions. The decision to favour Iraq rather than Egypt in terms of immigration and urbanization, if indeed they were rational decisions, as I believe they were, may have been taken after careful consideration based on conditions on the ground. Since the Mediterranean regions were very early judged to be disadvantageous for economic development, even after the move to Damascus, the orientation of the economic development did not change. The delayed recovery of Byzantium shows how right they were. In that respect Syria-Palestine urbanization resembled that of neighbouring Byzantium, and Byzantine historians agree that the eighth century saw depopulation, de-urbanization, diminished production, reduced trade, etc. on an unparalleled scale.[132] The decline in the fortunes of the Byzantine Empire was profound enough that the period which followed it was named the 'Byzantine revival'. Not surprisingly, the recovery is attributed in a very large measure to the upturn in the demographic trend. By 740, the end of the plague recurrence in Byzantium, demographic growth became evident in the creation of new settlements, or growth in existing villages. Byzantines used the same tactics as the Muslims, migrations or 'encouraged settlements' sometimes deportations, motivated by political and military interests. Also, as in the Islamic case, migrations in Byzantium were ethnically diverse, comprising Slavs, Armenians and Jacobite Syrians. Repopulated areas claimed from tens to several hundred thousands of new settlers. Notwithstanding the documentation about slaves going to Islamic destinations provided by McCormick, Byzantium probably purchased slaves as well. The decline in the number of cities, which reached its peak in the eighth century, with the population of Constantinople shrinking to 40,000-70,000, was equally changing and showed a net increase in the ninth and tenth centuries. Previous ruralization and declining urban density was reversed by further urban settlement and a "new" city type, located on a defensible, elevated land, together with the revival of old ones and creation of new.

It is noteworthy that not all historians believe in the severity of the Justinian and recurrent plagues, neither do they believe in the economic decline it caused, it being an 'exogenous' factor of the Malthusian kind, as a legitimate drive of change in economic structures. Since it relates to

[132] Angeliki Laiou and Cecile Morisson, *The Byzantine Economy*, (Cambridge, Cambridge University Press, 2007), 43-49

the regions under consideration here it should be mentioned. Chris Wickham, in his latest publication, expresses the view that however dramatic its local incidences, the Justinian plague was a marginal event in demographic history, given that no uniform pattern of demographic decline is found for the period: "The population fall that we do see, in a variety of different periods, must have had local causes."[133] Jairus Banaji, writes on the economy of Byzantine Egypt, "…there is no archeological evidence of a major catastrophe in the 7th century East Mediterranean. Nor was the economy of either empire substantially affected in a negative way".[134] Nonetheless, most Byzantine historians do agree that "A general decline in the number of settlements is assumed to have taken place in many other areas (Asia Minor, Cyprus and Northern Syria from 650 onwards)."[135] But Banaji also thinks that monetary circulation did not stop before or immediately after the Islamic conquest, it being a proof of the resiliency of Byzantine monetary systems.[136] Again Cécile Morisson: "Evidence for a decline in monetization comes from all regions and is well-attested phenomenon."[137]

In sum, the aftermath of plague was not the wave which lifted all boats and in the same manner, and the study of the purchasing power of wages, in addition to its most important contribution of placing Islamic medieval societies within a comparative examination, offers a compass in navigating a narrow lane between the 'hard facts' imposed by reading the historical sources, and a 'theoretical' framework.

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[133] Chris Wickham, *Framing the Early Middle Ages. Europe and the Mediterranean, 400-800.* (Oxford University Press, Oxford, 2006), 547-550.
[134] Jairus Banaji, *Agrarian Change in Late Antiquity. Gold, Labour and Aristocratic Dominance*, (Oxford, Oxford University Press, 2001) and Jairus Banaji, "Late Antique Legacies and Muslim Economic Expansion," in *Money, Power and Politics in Early Islamic Syria*, 168.
[135] Laiou and Morisson, *The Byzantine Economy*, p. 40. For full description of the devastating effect of the Justinian and recurrent plagues on the Byzantine lands, see 38-42.
[136] Banaji, *Agraraian Change*, 66-70.
[137] Laiou and Morisson, *Byzantine Economy*, p. 42, and the references in note 53.