

Complex historical dynamics of crisis: the case of Byzantium

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Abstract: In more than 1000 years of history, the Byzantine Empire experienced several severe times of crisis which brought it almost to the point of destruction. Yet, Byzantium proved to be one of the most resilient polities of medieval Europe and endured; even after the loss of its capital to the Crusaders of 1204, Byzantine statehood and church were able to regenerate in exile and to reclaim Constantinople after 57 years. But the political and economic environment had changed dramatically, and Byzantium could not re-establish its own imperial sphere in the Eastern Mediterranean; the commercial centres of Italy (Venice, Genoa) had integrated Byzantium’s former territories in the late medieval “Worldsystem”, in which Byzantium only occupied a position at the periphery; and new expansive Turkish polities had emerged in Western Asia Minor, which reduced Byzantium to a South-Eastern European regional power and finally after 1350 extended their power to the politically fragmented Balkans. Internally, competing aristocratic factions, ecclesiastical disputes and a “lack of unity and social cohesion” weakened the central state’s ability to adapt to the challenges of this new environment. Despite this complex of factors and developments, contemporary scholarship still often considers Late Byzantium a “Pseudo-Empire”, more or less “programmed” for destruction after 1204 (or even earlier), and interprets the development of these 250 years from the perspective of its endpoint – the Ottoman conquest of 1453. Our paper challenges this view; it aims at a new analysis of Byzantium’s “last centuries” not as an isolated case, but from the perspective of a pre-modern polity facing the same dramatic changes and challenges as others societies did at the same time of the “Late Medieval Crisis”, which took hold of the entire old world from China to England in the 14th century. At the same time, we implement concepts, models and tools provided by the new fields of complexity studies and social network analysis in order to include the historical dynamics of crisis and adaptation in all its complexities at the level of macro-processes (in demography, climate and economy), of the structural framework of political, economic, social and religious networks, of individual and collective decision making and reaction to crisis phenomena. Thus, it becomes possible to identify similarities and peculiarities of Byzantium’s development in comparison with other contemporary polities and to find answers to the question why some segments of the Byzantine framework were able to adapt and to survive beyond 1453 within the new Ottoman framework while the Byzantine polity in its totality collapsed.

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0. Prologue

In 1343 und 1346 within three years, the two largest European banking companies of the Peruzzi and of the Bardi, which the Florentine Historian Giovanni Villani (d. 1348), himself a former associate of the Peruzzi (with 2,000 florins), had called the "*pillars of Christianity*", went bankrupt, causing not minor economic disturbance in their hometown of Florence. One cause of the two banking houses' insolvency, so tells us Villani, was the inability of King Edward III of England (1327–1377), who tried to finance the first campaigns of what was to become the Hundred Years' War in France in these years, to repay the loans provided for him by the Italian bankers; the total loans exceeded one million gold ducats, more than three times the state budget of Florence at this time and two times the total annual revenues of the English King. The King's revenues in turn were afflicted by an economic depression (especially under worsening climatic conditions in the most relevant agricultural sector), which England and other European countries had captured in the last decades.¹

Yet, not only economic downturn in England and warfare in France affected the Florentine financial community, but also perturbations in the Western and Eastern Mediterranean, where the Bardi and Peruzzi equally were active, especially in the grain trade with southern Italy and Sicily, the transfer of payments from Latin bishoprics in the Aegean and on Cyprus to the Papal court in Avignon (with more modest sums between 3,000 and 12,000 ducats) and in credit transactions with the Knights

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¹ A. SAPORI, *Storia interna della compagnia mercantile dei Peruzzi*, in: IDEM, *Studi di Storia economica*, s. XIII–XIV–XV. Florence 1982, 653–694; E. S. HUNT, *The Medieval Super-Companies: A Study of the Peruzzi Company of Florence*. Cambridge 1994, 1, 212–229 (also with a discussion on the claims of Villani with regard to the causes of the bankrupt), cf. also IDEM – J. M. MURRAY, *A History of Business in Medieval Europe, 1200–1500* (*Cambridge Medieval Textbooks*). Cambridge 1999, 116–121; J. M. NAJEMY, *A History of Florence 1200–1575*. Malden – Oxford 2006, 133–144; S. L. WAUGH, *England in the reign of Edward III* (*Cambridge Medieval Textbooks*). Cambridge 1991, 183–186; M. PRESTWICH, *Plantagenet England 1225–1360* (*The New Oxford History of England*). Oxford 2005, 269–278, 287–289; U. DIRLMEIER – G. FOUQUET – B. FUHRMANN, *Europa im Spätmittelalter 1215–1378* (*Oldenbourg Grundriss der Geschichte* 8). Munich ²2009, 41–52, 183–193.

Hospitaller on Rhodes (whom the Peruzzi had helped to finance to conquest of the island in 1309).² On Sicily, various aristocratic factions were at war with each other since the death of King Frederick III (who also had been a debtor of the Peruzzi) in 1337.³ And in the Byzantine Empire, where the Peruzzi maintained a trading agency in Constantinople, in 1341 a civil war had broken out between the regency for the minor Emperor John V Palaiologos and the faction of the leading aristocrat John VI Kantakuzenos, which would last until 1347 (and continue later on) and involved all neighbouring powers, among them Bulgaria, Serbia and the Turkish Emirates of Aydın, whose fleets time and again plundered "Latin" possessions in the Aegean, and of the Ottomans.⁴ In the (until that time) most important trading area between the Mediterranean World and Asia, the Crimea, equally existed a state of war between the Mongolian Golden Horde and the colonies of Venice and Genoa, which of course damaged business.⁵ Phenomena of crisis could be even observed by far travelling Italian merchants at the other endpoint of the Silk road in China, where Emperor's Huizong's long reign (1333–1368/1370) was troubled in the 1340s by cold, drought, famine and flood (because of the same deteriorating climatic conditions as in other parts of the Northern Hemisphere), epidemics, increasing resistance against the Yuan Dynasty and the sighting of dragons, marking the beginning of the end of Mongolian dominance over the country.⁶ A plague epidemic, maybe the same that afflicted China, finally also reached Europe via the trade route from Central Asia to the Crimea and to Constantinople, where the Black Death first appeared in 1347; from there it reached all regions connected by the international commercial network from Scandinavia to Egypt within the next few years, killing between 30 and 60 % of the population.⁷

² Y. RENOARD, *Les relations des Papes d'Avignon et des compagnies commerciales et bancaires de 1316 à 1378*. Paris 1941, 163–166; HUNT, *The Medieval Super-Companies* 55–57, 72, 87, 107, 134.

³ HUNT, *The Medieval Super-Companies* 55–57, 118; St. A. EPSTEIN, *An island for itself. Economic development and social change in late medieval Sicily*. Cambridge 1992, 317–322.

⁴ Cf. D. M. NICOL, *The Last Centuries of Byzantium 1261–1453*. Cambridge ²1993, 185–250, and below. HUNT, *The Medieval Super-Companies* 55, 87, 134.

⁵ B. SPULER, *Die Goldene Horde. Die Mongolen in Rußland 1223–1502*. Wiesbaden ²1965, 394–400; P. JACKSON, *The Mongols and the West 1221–1410*. Harlow 2005, 293–304, also on the economic and commercial situation.

⁶ T. BROOK, *The troubled Empire. China in the Yuan and Ming Dynasties*. Cambridge, Mass. – London 2010, 6–9, 50–78, 270; F. W. MOTE, *Imperial China 900–1800*. Cambridge, Mass. – London 1999, 467–497, 517–548; J. GERNET, *Die chinesische Welt. Die Geschichte Chinas von den Anfängen bis zur Jetztzeit*. Frankfurt am Main 1989, 329–330. Cf. also V. LIEBERMAN, *Strange Parallels. Southeast Asia in Global Context, c. 800–1830*. Vol. 2: *Mainland Mirrors: Europe, Japan, China, South Asia, and the Islands*. Cambridge 2009, 17–19, 58–67, 77–84, on common patterns of "crises" in all the regions mentioned in his title in the 14th century.

⁷ O. J. BENEDICTOW, *The Black Death 1346–1353. The Complete History*. Woodbridge 2004, 35–63.

Crisis became catastrophe of almost unprecedented scale, dwarfing the bankrupt of kings and their financiers. The long term consequences of these "cataclysmic" events of the mid-14th century influenced the next centuries.⁸ One of the outcomes of these decades of crisis was the reduction of the medieval Roman Empire in the East, which modern historiography calls the Byzantine one, to a petty state which was at the mercy of stronger political and economic forces. This was not the first severe crisis Byzantium had to endure, but this one proved to be fatal; therefore, it should be analysed in depth on the following page, but not without setting it in the context of previous crises of the Byzantine polity.

1. Byzantium – an empire of crisis?

The Byzantine Empire "owes" its existence to the crisis of the Later Roman Empire; the decades of internal instability, foreign invasions (Germanic tribes, Sasanian Persia) and economic as well as demographic decline in the 3rd century AD (the period of the "soldier emperors")⁹ led to the establishment of a new political, military and administrative framework under the emperors Diocletian (284–305) and Constantine I (306–337), who also laid the foundations for a Christian *Imperium Romanum* and for a new centre of imperial power in the East (Constantinople).¹⁰ After the death of emperor Theodosius I in 395 the division of the Empire between an emperor in the West and in the East became permanent; but while the power of the Western empire dramatically declined in the following decades because of the establishment of Germanic peoples on its territory until its abolishment in 476¹¹, the Eastern Empire was able to survive, although its Balkan provinces were occupied and pillaged time and again since the battle of Adrianople in 378 until the migration of the Ostrogoths to Italy in 488. But since the richest provinces of the Eastern Empire in Egypt and Syria were beyond the reach of northern invaders (with the exemption of a Hunnic inroad to Eastern Anatolia and Northern Syria and Mesopotamia in 395) and at the same time peace was lasting at the

⁸ Cf. for instance S. PAMUK, The Black Death and the Origins of the "Great Divergence" across Europe, 1300–1600. *European Review of Economic History* 11 (2007) 289–317.

⁹ For a recent overview cf. D. S. POTTER, The Roman Empire at Bay AD 180–395 (*Routledge History of the Ancient world*). London – New York 2004, 215–298; Kl.-P. JOHNE (ed.), Die Zeit der Soldatenkaiser: Krise und Transformation des Römischen Reiches im 3. Jahrhundert n. Chr. (235–284). 2 Volumes, Berlin 2008.

¹⁰ POTTER, The Roman Empire at Bay 299–439; R. VAN DAM, The Roman Revolution of Constantine. Cambridge 2007.

¹¹ A. DEMANDT, Der Fall Roms. Die Auflösung des Römischen Reiches im Urteil der Nachwelt. Munich 1984; A. DEMANDT, Die Spätantike. Römische Geschichte von Diocletian bis Justinian 284–565 n. Chr. (*Handbuch der Altertumswissenschaften* Abt. III/6). Munich ²2007; P. HEATHER, The Fall of the Roman Empire. A New History. London 2005.

frontier to Sasanian Persia for the most of the 5th century¹², the imperial centre in Constantinople was able to maintain its administrative and military instruments of power.¹³ Historical and archaeological research even indicates a period of economic and demographic growth in these province in the 5th and early 6th century, which also provided the means for the partly successful attempts of Emperor Justinian I (527–565) to re-conquer the provinces in the western Mediterranean (Northern Africa, Italy, Southern Spain).¹⁴

1.1 A crisis of contraction (6th to 8th century)

The "(other) age of Justinian"¹⁵ also marks the end of this growth period; in the 530s signs of deteriorating climatic conditions appeared, but the most enduring effect on the demographic and economic basis of the Empire had the "Justinianic Plague", which in 541 broke out in Egypt, in 542 (on board of the grain fleet) reached Constantinople and in the following months and years reduced the population in all provinces (at a rate of possibly 30 %). As periodic outbreaks of the plague continued in the following decades until the middle of the 8th century, demographic recovery was restrained.¹⁶ At the same time, also the political environment beyond the Empire's borders changed to its disadvantage; almost constant warfare with the rival empire of Sasanian Persia re-occurred in the 6th and early 7th century and damaged Byzantium's finances as well as its Eastern provinces. In Europe, after the death of Justinian I the Lombards occupied wide regions in re-conquered Italy, the Avars established their polity in modern-day Hungary and plundered the territories to their south, while Slavic groups started to settle in the

¹² G. GREATREX - S. N. C. LIEU, *The Roman Eastern Frontier and the Persian Wars. Part II: A.D. 363–630. A narrative Sourcebook*. London – New York 2002; J. HOWARD-JOHNSTON, *The two Great Powers in Late Antiquity: a Comparison*, in: A. CAMERON (Hrsg.), *The Byzantine and Early Islamic Near East III. States, Resources and Armies*. Princeton, New Jersey 1995, 157–226.

¹³ St. WILLIAMS – G. FRIELL, *The Rome That Did Not Fall. The Survival of the East in the Fifth Century*. London 1999.

¹⁴ M. MAAS (ed.), *The Cambridge Companion to the Age of Justinian*. Cambridge 2005; M. F. HENDY, *Studies in the Byzantine Monetary Economy c. 300–1450*. Cambridge 1985; P. SARRIS, *Economy and Society in the Age of Justinian*. Cambridge 2006.

¹⁵ Cf. M. MEIER, *Das andere Zeitalter Justinians. Kontingenzerfahrungen und Kontingenzbewältigung im 6. Jahrhundert n. Chr.* Göttingen 2003.

¹⁶ W. BEHRINGER, *Kulturgeschichte des Klimas. Von der Eiszeit bis zur globalen Erwärmung*. Munich 2007, 94–97; D. STATHAKOPOULOS, *Famine and Pestilence in the Late Roman and Early Byzantine Empire*. Aldershot 2004; L. K. LITTLE (Hrsg.), *Plague and the End of Antiquity: The Pandemic of 541–750*. Cambridge 2006; A. LAIOU – C. MORRISON, *The Byzantine Economy (Cambridge Medieval Textbooks)*. Cambridge 2007, 39–42; A. LOUTH, *Justinian and his Legacy (500 – 600)*, in: J. SHEPARD (ed.), *The Cambridge History of the Byzantine Empire, c. 500–1492*. Cambridge 2008, 122–123.

interior of the Balkans.¹⁷ Internal turmoil after the overthrow of emperor Mauricius in 602 added to the weakness of the Empire, and in the 610s and 620s, when Persian troops conquered the richest provinces in Syria, Palestine and Egypt and the Empire lost control over the interior of the Balkans to Avars and Slavs, culminating in the siege of Constantinople in 626, Byzantium was at the edge of collapse. But the attackers of the capital were repelled, and Emperor Heraclius (610-641) was able to outmaneuver the Persian armies and forced the Sasanians to sign a favourable peace.¹⁸ This triumph proved to be short-living, since after the death of the prophet Mohammed in 632, the Arabs started to invade the eastern provinces, where Byzantium's position was still weak after the decades of war with Persia; until 642, Syria, Palestine and Egypt were lost and with them presumably two thirds of the revenues of the Empire.¹⁹ However, while the Sasanian Empire was totally conquered by Arab forces within 20 years²⁰, Byzantium again was able to survive these heavy blows. But it was an Empire not only on a smaller territorial scale (with its most important provinces now in Asia Minor, whose permanent occupation the Arabs never could achieve, in the southern and coastal areas of the Balkans and in Southern Italy and Sicily), but also a "reduced and impoverished" polity, with most cities "reduced (...) to fortified garrison towns" due to the depopulation and "ruralisation" of the provinces (because of the plague and constant invasions)²¹; this downsizing of cities is evident in archaeological findings, which also indicate a "dwindling of coin circulation between 650 and 850" in the cities.²² Adverse climatic (a frozen Bosphorus in the winter 763/764), demographic (plague outbreaks until 750) and

¹⁷ W. POHL, *Die Awaren. Ein Steppenvolk in Mitteleuropa 567–822 n. Chr.* Munich ²2002; F. CURTA, *Southeastern Europe in the Middle Ages 500–1250 (Cambridge Medieval Textbooks)*. Cambridge 2006.

¹⁸ Cf. W. E. KÆGI, *Heraclius, Emperor of Byzantium*. Cambridge 2003.

¹⁹ F. M. DONNER, *The Early Islamic Conquests*. Princeton 1981; W. E. KÆGI, *Byzantium and the early Islamic Conquest*. Cambridge 1992.

²⁰ Cf. now P. POURSHARIATI, *Decline and Fall of the Sasanian Empire. The Sasanian-Parthian Confederacy and the Arab Conquest of Iran*. New York 2008.

²¹ H. SARADI, *Towns and Cities*, in: JEFFREYS – HALDON – CORMACK (eds.), *The Oxford Handbook of Byzantine Studies* 321.

²² For the crises of the 6th to 8th century in general see: J. KODER, "Zeitenwenden". *Zur Periodisierungsfrage aus byzantinischer Sicht. Byzantinische Zeitschrift* 84/85 (1991/1992) 409–422, esp. 411; J. F. HALDON, *Byzantium in the Seventh Century. The Transformation of a Culture*. Cambridge ²1997; R.-J. LILIE, *Byzanz. Das zweite Rom*. Berlin 2003, 75–141; C. MORRISON (ed.), *Le Monde Byzantin I. L'Empire romain d'Orient (330–641)*. Paris 2004; J.-C. Cheynet (ed.), *Le Monde Byzantin II. L'Empire byzantin (641–1204)*. Paris 2006; A. LOUTH, *Byzantium Transforming (600–700)*, in: J. SHEPARD (ed.), *The Cambridge History of the Byzantine Empire, c. 500–1492*. Cambridge 2008, 221–248; M.-F. AUZÉPY, *State of Emergency (700–850)*, in: J. SHEPARD (ed.), *The Cambridge History of the Byzantine Empire, c. 500–1492*. Cambridge 2008, 251–291; M. WHITTOW, *The Middle Byzantine Economy (600–1204)*, in: J. SHEPARD (ed.), *The Cambridge History of the Byzantine Empire, c. 500–1492*. Cambridge 2008, 469–486; J. HALDON, *Political-Historical Survey 518–800*, in: E. JEFFREYS – J. HALDON – R. CORMACK (eds.), *The Oxford Handbook of Byzantine Studies*. Oxford 2008, 256–257; IDEM, *The Byzantine Empire* 218–221.

political conditions (continuous warfare against the Arabs, establishment of the Bulgarians as new competing power in the Balkans after 680²³) continued in the 7th and 8th centuries, "when man and nature conspired to bring the empire almost to the point of extinction"²⁴.

Again, the Byzantine Empire did not fall; it was able to hinder the Arabs from permanent conquest of its new core territories in Asia Minor and repelled two longer sieges of Constantinople, which despite a significant loss of population after the Justinianic maximum of maybe 500,000 inhabitants remained an impressive imperial centre (its relative relevance for the empire even increased because of the loss of the cities of Antioch and Alexandria to the Arabs), in the 670s and in 717/718. The administrative and military framework was bit by bit adapted to the new scale of resources and new challenges, so that "the empire metamorphosed into a great Balkano-Anatolian power, administered coherently and financed through an effective tax system."²⁵

1.2 A crisis of growth (11th century)

From the middle of the 9th century, the conditions for the empire improved – both politically, as the central power in the Arab Caliphate disintegrated and the scale of the Arab threat relatively diminished²⁶, and climatically (the "medieval climate anomaly" between 800/850 and 1250/1300²⁷); an increase in security and temperatures favoured demographic and economic growth, and "by the tenth century at latest it is clear that the Mediterranean economy was reviving and, equally, that the Byzantine world shared in this process."²⁸ From 950 onwards, Byzantium was also on the offensive again,

²³ D. ZIEMANN, Vom Wandervolk zur Großmacht. Die Entstehung Bulgariens im frühen Mittelalter (7.–9. Jahrhundert) (*Kölner Historische Abhandlungen* 43). Cologne – Weimar – Vienna 2007.

²⁴ AUZÉPY, State of Emergency 255.

²⁵ R.-J. LILIE, Die byzantinische Reaktion auf die Ausbreitung der Araber. Studien zur Strukturwandlung des byzantinischen Staates im 7. und 8. Jhd. (*Miscellanea Byzantina Monacensia* 22). Munich 1976; AUZÉPY, State of Emergency 291; SCHREINER, Byzanz 158. Cf. also C. ZUCKERMAN, Learning from the Enemy and More: Studies in „Dark Centuries“ Byzantium. *Millennium. Jahrbuch zu Kultur und Geschichte des ersten Jahrtausends n. Chr.* 2/2005, 79–135, for some new interpretations of the transformations in these centuries.

²⁶ A. A. VASILIEV – M. CANARD, Byzance et les Arabes. 3 Volumes, Brussels 1935–1968; W. E. KAEGLI, Confronting Islam: Emperors versus Caliphs (641–c. 850), in: SHEPARD, The Cambridge History of the Byzantine Empire 365–394.

²⁷ On the global scale of this phenomenon cf. also LIEBERMAN, Strange Parallels 143; BEHRINGER, Kulturgeschichte des Klimas 103–115.

²⁸ WHITTOW, The Middle Byzantine Economy 473–476; M. MCCORMICK, Origins of the European Economy: Communications and Commerce AD 300–900. Cambridge 2002; A. HARVEY, Economic Expansion in the Byzantine Empire, 900–1200. Cambridge 1989; IDEM, The Byzantine Economy in an International Context. *Historisch Tijdschrift Groniek* 39/171 (2006) 163–174; W. TREADGOLD, The Byzantine Revival 780–842. Stanford 1988.

reconquering lost territories in Eastern Anatolia, Cilicia and northern Syria as well as the islands of Cyprus and Crete; an apex was reached in the reign of Basil II (976–1025), who annexed various principalities in Armenia and destroyed the Bulgarian state in the Balkans in a long war, thus re-establishing Byzantine power from the Danube to the Lake Van.²⁹

Yet, only 50 years after Basil's death, Byzantium was again on the fringe of collapse. But if the 6th to 8th century were characterised by a "crisis of reduction" (in terms of demography, economy and territory), the 11th century shows signs of a "crisis of growth". The question in recent scholarly discussions is: which aspects of the demographic, economic and territorial expansion of Byzantium proved detrimental in the long run? A "classic" explanation of the calamities which befell the empire after 1025 is the growth of the economic and political power of the "aristocratic" great families at the cost of the free peasantry, which in this interpretation had provided the financial and military backbone of the Empire after the 7th century and which the emperors had tried to protect with legislative measures to no avail (Georg Ostrogorsky wrote about a "feudalisation" of Byzantium)³⁰; equally, the military framework, which had guaranteed the defence of the Empire, was weakened thereby in favour of a more offensive one at a period when Byzantium should have switched again to defence in the face of new external threats (the Normans in Southern Italy, the Pechenegs in the Balkans, the Seljuks in the East), and central state power declined in favour of aristocratic clans (also Basil II was forced to fight two representatives of these clans in the early decades of his reign) – "private interests gained at the expense of the state"; for Peter Schreiner, this is even "the seed of decay" which finally led to the collapse of Byzantium 450 years later.³¹

²⁹ LILIE, Byzanz. Das zweite Rom 212–256; W. FELIX, Byzanz und die islamische Welt im früheren 11. Jahrhundert (*Byzantina Vindobonensia* 14). Wien 1981; P. STEPHENSON, Byzantium's Balkan Frontier. A Political Study of the Northern Balkans, 900–1204. Cambridge 2000; C. HOLMES, Basil II and the Governance of Empire (976–1025). Oxford 2005.

³⁰ G. OSTROGORSKY, Geschichte des byzantinischen Staates (*Byzantinisches Handbuch* I/2). Munich ³1963 (English version 1968, there 316–375). As Byzantium never had a legally defined aristocracy as in the medieval West, the inverted commas should always be mentally added if we mention a Byzantine "aristocracy" or "nobility", cf. K.-P. MATSCHKE – F. TINNEFELD, Die Gesellschaft im späten Byzanz. Gruppen, Strukturen und Lebensformen. Cologne – Weimar – Vienna 2001, 16. On the development of this group in the 11th and 12th century see also the excellent study of A. P. KAZHDAN – S. RONCHEY, L'aristocrazia bizantina dal principio dell'XI alla fine del XII secolo. Palermo ²1999; E. PATLAGEAN, Familie und Verwandtschaft in Byzanz, in: A. BURGUIÈRE – CH. KLAPISCH-ZUBER – M. SEGALAN – F. ZONABEND (eds.), Geschichte der Familie. Mittelalter. Frankfurt am Main 1997, 207–236; HALDON, The Byzantine Empire 219–224.

³¹ M. ANGOLD, Belle époque or Crisis? (1025–1118), in: J. SHEPARD (ed.), The Cambridge History of the Byzantine Empire, c. 500–1492. Cambridge 2008, 584–585; P. SCHREINER, Schein und Sein. Überlegungen zu den Ursachen des Untergangs des byzantinischen Reiches. *Historische Zeitschrift* 266 (1998) 625–647 (reprint in IDEM, Byzantinische Kultur. Eine Aufsatzsammlung. I: Die Macht [*Opuscula Collecta* 3]. Rom

As a matter of fact, less the defeat of the Byzantine army against the Seljuks at Mantzikert in 1071 than the following wars between various contenders for the throne, who also sought the help of Turkish allies, led to the loss of almost entire Asia Minor, the former core region of Byzantine power, to the Turks.³² But there exist also other interpretations; Michael Angold terms Basil's II achievements "a poisoned legacy": his "iron rule represents an aberration in the exercise of imperial authority in Byzantium", his "triumph over the Bulgarians gave a false impression of the strength of the empire" and even "Constantinople was (...) disproportionately large and gave a false impression of Byzantine strength". According to this interpretation, Basil II "overextended" the empire's frontiers and its demographic and economic resources.³³ For Jonathan Shepard, "the expansion was not ruinous in itself", but an enlarged army and administrative apparatus (necessitated by the territorial as well as economic expansion) and the emerging of local and provincial elites with interests of their own put a strain on the traditional system which led to crisis in combination with the new "plethora of enemies, fast-moving and mutating" from the exterior.³⁴ Alan Harvey finally considers the advance of the great aristocratic estates essential for economic and demographic growth in the 10th and 11th centuries and the land legislation of the Macedonian emperors "misconceived" and impeding the "very process that was enriching Byzantine society as a whole".³⁵ Also the coin debasements which were implemented by emperors of the 11th century for some scholars demonstrate that the state could not keep pace with the "booming economy", which had led to a "liquidity crisis" because of the lack of coins for economic exchange – whereas for others these measures are signs for the rising burdens for the empire's defence.³⁶ Already, these discussions demonstrate that crisis has to be understood in a multi-causal way.

2006, no. III); IDEM, Byzanz 565–1453 (*Oldenbourg Grundriss der Geschichte* 22). Munich ³2008, 157–160; cf. also P. Frankopan, Land and Power in the Middle and Late Period, in: J. HALDON (ed.), *The Social History of Byzantium*. Malden - Oxford 2009, 112–142, and J. HALDON, Social Élites, Wealth and Power, in: *ibid.* 168–221.

³² C. Hillenbrand, *Turkish Myth and Muslim Symbol. The Battle of Manzikert*. Edingburgh 2007.

³³ ANGOLD, *Belle époque or Crisis 584–587*. Cf. also M. ANGOLD, *The Byzantine Empire 1025–1204*. London – New York 1984. A similarly critic assessment of Basil II and an analysis of the 11th century crisis also in: LILIE, *Byzanz. Das zweite Rom* 249–271. For the concept of "imperial overstretch" see P. KENNEDY, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict From 1500 to 2000*. New York 1987.

³⁴ J. SHEPARD, *Equilibrium to Expansion (886–1025)*, in: IDEM (ed.), *The Cambridge History of the Byzantine Empire, c. 500–1492*. Cambridge 2008, 531–536.

³⁵ HARVEY, *Economic Expansion*; IDEM, *The Byzantine Economy in an International Context* 170; WHITTOW, *The Middle Byzantine Economy* 473–476; ANGOLD, *Belle époque or Crisis 584–585*.

³⁶ ANGOLD, *Belle époque or Crisis 590–601*; C. KAPLANIS, *The Debasement of the "Dollar of the Middle Ages"*. *The Journal of Economic History* 63/3 (2003) 768–801.

1.3 The collapse of the "Comnenian system" (1180–1204)

The crisis of the 11th century resulted in the loss of most parts of Asia Minor (with presumably again two thirds of the empire's revenues) to the Turks, while the remaining provinces in South-eastern Europe were menaced by Pechenegs and Normans; at the same time, internal unrest continued until the takeover of Emperor Alexios I Komnenos (1081–1118), the leader of one of the aristocratic factions. He was able to stabilise the empire externally (by repelling the Normans with the help of Venice and reconquering the most fertile western parts of Asia Minor in the slipstream of the First Crusade) and internally by establishing his own family and its members in the central positions of powers and in the centre of a network of related aristocratic clans; thus "he rebuilt imperial government as an aristocratic connection; family business might be a more accurate description".³⁷ Under Alexios I and his successors John II (1118–1143) and Manuel I (1143–1180) Byzantium re-emerged as a great power in the Eastern Mediterranean, in the possession of the most productive areas in the west and at the coasts of Asia Minor and the major part of South-eastern Europe, where, as in the rest of Europe, the economic and demographic growth period continued well into the incipient 14th century. Yet Byzantium had to accept the increasing presence of Western powers (Crusader states) in their neighbourhood and of Italian merchants in its former almost exclusive commercial sphere; Venice (for its help against the Normans) and later Genoa and Pisa received privileges which allowed them to trade in the Constantinople and other (increasingly) important centres at a special customs tariff.³⁸ These commercial activities may have contributed to the economic expansion, but they also led to growing tensions between foreign merchants and indigenous population, which were intensified by religious differences (after the so-called "Schism of 1054").³⁹ At the same

³⁷ ANGOLD, Belle époque or Crisis 612–613; a more detailed description of the "Comnenian system" in P. MAGDALINO, *The Empire of Manuel I Komnenos 1143 – 1180*. Cambridge 1993, 180–227. For a comparative survey of the Comnenian Empire and the Holy Roman Empire under the Hohenstaufen cf. M. BORGOLTE, *Europa entdeckt seine Vielfalt 1050–1250 (Handbuch der Geschichte Europas 3)*. Stuttgart 2002.

³⁸ R.-J. LILIE, *Handel und Politik zwischen dem byzantinischen Reich und den italienischen Kommunen Venedig, Pisa und Genua in der Epoche der Komnenen und Angeloi (1081–1204)*. Amsterdam 1984; D. M. NICOL, *Byzantium and Venice. A Study in Diplomatic and Cultural Relations*. Cambridge 1988; R.-J. LILIE, *Byzantium and the Crusader States 1096–1204*. Oxford 1993; R.-J. LILIE, *Byzanz und die Kreuzzüge*. Stuttgart 2004; P. FELDBAUER – J. MORRISSEY, *Venedig 800–1600. Wasservögel als Weltmacht (Expansion. Interaktion. Akkulturation. Historische Skizzen zur Europäisierung Europas und der Welt 1)*. Wien 2002.

³⁹ HARVEY, *The Byzantine Economy in an International Context* 169; cf. H. HUNGER, *Graecus perfidus – Italos itamos. Il senso dell'alterità nei rapporti greco-romani ed italo-bizantini*. Rom 1987; J. KODER, *Latinoi – The image of the Other according to Greek Sources*, in: *Bisanzio, Venezia e il mondo franco-greco (XIII–XV secolo)*. Atti del Colloquio Internazionale organizzato nel centenario della nascita di R.-J. Loenertz o. p., Venezia 1–2 dicembre 2000, a cura di C. A. MALTEZOU e P. SCHREINER. Venice 2002, 25–39; T. M. KOLBABA, *The Byzantine Lists – Errors of the Latins (Illinois Medieval Studies)*. Urbana – Chicago 2000.

time, factionalism in the "aristocratic empire" of the 12th century neither disappeared in the centre, where it was now localized within the extended Komnenian clan, nor in the provinces, where economic growth also enhanced the power bases of local magnates. Thus, the ad-hoc solutions for the handling of the 11th century crisis had unexpected dangerous effects as soon as a weakening of central imperial power allowed these conflicting forces to come to the surface; Paul Magdalino even wrote: "under the successors of Manuel I the Komnenian system (...) was programmed for self-destruction"; and Peter Schreiner stated that "in the year 1204, the Byzantine Empire was neither governable nor viable".⁴⁰ Actually, within only 24 years after the death of Manuel I in 1180, the system collapsed. Various members of the Komnenian family and the related clan of the Angeloi took their turns on the imperial throne, whose power dwindled away first in more exterior provinces such as Bulgaria (since 1185) or Cyprus (in 1185) and finally also in core regions such as the Peloponnese or in Western Asia Minor, where local potentates took over control (Emperor Isaac II alone faced at least 17 revolts during his reign from 1185 to 1195); at the same time, emperors either alienated the Western powers (assaults on Genoese and Pisan merchants in Constantinople in 1182, confrontation with the crusaders under Emperor Frederick I Barbarossa in 1188), tried to appease them (paying of the "Alamanikon" as tribute to Emperor Henry VI in 1196) or finally invited them to intervene in the struggles for the imperial throne, which led to the Fourth crusade and the "cosmic cataclysm" of the conquest of Constantinople by Crusaders and Venetians in 1204.⁴¹ The Byzantine Empire seemingly had not survived the crisis of 1180 to 1204.

1.4 The revival and final decline of a "Pseudo-Empire"? (1261-1453)⁴²

Yet, the relative increase in power of the provinces now allowed for the constitution of several "Byzantine" states in exile in Northeastern Asia Minor ("Empire of Trebizond"), in Northwestern Greece ("Despotate of Epirus") and, most successfully, in Northwestern Asia Minor ("Empire of Nicaea") by members of the aristocracy; on the rich agricultural

⁴⁰ P. MAGDALINO, *The Empire of the Komnenoi (1118–1204)*, in: SHEPARD (ed.), *The Cambridge History of the Byzantine Empire 627–663*, esp. 663; SCHREINER, *Schein und Sein* 631.

⁴¹ Ch. M. BRAND, *Byzantium confronts the West 1180–1204*. Cambridge, Mass. 1968; M. ANGOLD, *The Fourth Crusade. Event and Context*. Edinburgh 2003; M. ANGOLD, *After the Fourth Crusade: The Greek Rump State and the Recovery of Byzantium*, in: SHEPARD (ed.), *The Cambridge History of the Byzantine Empire 731*; SCHREINER, *Schein und Sein* 628 – 630.

⁴² For a general overview cf. NICOL, *The Last Centuries of Byzantium*. For the term „Pseudo-Empire“ cf. SCHREINER, *Schein und Sein* 635–638.

basis of Western Asia Minor, Theodore I Laskaris (1204–1221) and John III Dukas Vatatzes (1221–1254) were able to establish a more robust imperial government which again was based on the incorporation of other aristocratic clans, who, like the church, received tax immunities and land grants, but, as under the first three Comnenian rulers, power was, for the time being, centralised around the Emperor and his household.⁴³ Nicaea also profited from favourable external factors, as competing powers either neutralized each other (the Bulgarians defeating the Latin Empire of Constantinople in 1205 and the ruler of Epirus in 1230) or where subjugated by the Mongols in 1241/1243 (Bulgaria and the Seljuks), who did not tangent Nicaean territory.⁴⁴ Thus Nicaean forces where able to occupy Thrace and Macedonia in the decades after 1235 and to isolate Latin-controlled Constantinople. But the awkward equilibrium between imperial power and aristocracy proved to be short-lived; the attempt of Emperor Theodore II Laskaris (1254–1258) to rely on *homines novi* from outside the aristocratic clans for his regime ended with his premature death in 1258 and the minority of his son John IV.⁴⁵ Again, the leader of the strongest aristocratic faction took over power in the person of Michael VIII Palaiologos (1258–1282), who gradually pushed the young John IV Laskaris aside and distributed the positions of powers among his relatives and allies. The successes of his early reign – the victory over an alliance of Epirus, the Latin duke of Achaia and the king of Sicily in 1259 and the unexpected re-conquest of Constantinople in 1261 – seemed to legitimise his takeover. But with the reestablishment of empire and patriarchate in Constantinople, "the new Byzantine Empire took over the burdens of the big old state from before 1204".⁴⁶ In order to prevent renewed attempts of Western conquest (especially under the aegis of King Charles I of Anjou), Michael VIII accepted and enforced a union of churches with the papacy against large parts of the ecclesiastics and the lay people, for whom community with the so-called Latins implied treason

⁴³ M. ANGOLD, *A Byzantine Government in Exile. Government and Society under the Laskarids of Nicaea (1204-1261)*. Oxford 1975; E. MITSIOU, *Untersuchungen zu Wirtschaft und Ideologie im „Nizänischen“ Reich*. Dissertation, Vienna 2006. Because of this „regeneration“ of Byzantine statehood after the collapse of the "Comnenian system", Peter Schreiner considers the "year 1204 a positive event in the long term", cf. SCHREINER, *Schein und Sein* 631–633. For a similar opinion see MAGDALINO, *The Empire of the Komnenoi* 663.

⁴⁴ SCHREINER, *Schein und Sein* 635–638.

⁴⁵ Cf. D. ANGELOV, *Imperial Ideology and Political Thought in Byzantium, 1204–1330*. Cambridge 2007, 204–252; LILIE, *Byzanz. Das zweite Rom* 476.

⁴⁶ LAIOU, *The Palaiologoi and the World around them* 805; ANGELOV, *Imperial Ideology and Political Thought* 78–115.

against the holy traditions.⁴⁷ At the same time, the reduced empire had to provide the means for an army and diplomacy of appropriate scale for the role of a great power which Byzantium attempted (or had) to play under Michael VIII for the last time; especially the provinces in Asia Minor, the former core of the Nicaean state, were "neglected, heavily taxed and suffered from Turkish attacks."⁴⁸ And so, the verdict upon the result of Michael's reign is mostly negative in modern research; "his efforts left Byzantium exhausted and virtually bankrupt. His legacy was one of schism, poverty and rapid decline."⁴⁹ As a matter of fact, neither Michael VIII nor his successors were able to reverse the process of territorial fragmentation in the former Byzantine core areas on the two sides of the Aegean, which, as we have seen above, had begun in the late 12th century and was intensified with the *partitio imperii* of 1204; and as Western Asia Minor was almost totally lost to various Turkish Emirates, among them the Ottomans, in the years between 1280 and 1330, only Thrace and Macedonia remained as base for the Palaiologan Empire of the early 14th century, which became, according to modern research, "a small state with reduced finances and armed forces" in Southeastern Europe and part of a decentralised system of competing polities of medium or minor scale.⁵⁰ One interconnecting factor in this fragmented political environment was the trading network established and dominated by the Italian cities of Venice and Genoa, who integrated Constantinople, Thessalonike and other cities in a "World System", which connected the Mediterranean World with Asia, especially during the period of the *Pax Mongolica* between 1250 and 1350.⁵¹ But the privileges of the Italian Merchants, which also the Palaiologoi had to acknowledge after 1261, meant that the budget of the Byzantine state could not profit from the increased volume of trade in a corresponding dimension.⁵² State power and resources were also again limited and reduced by the

⁴⁷ B. ROBERG, Die Union zwischen der griechischen und der lateinischen Kirche auf dem II. Konzil von Lyon. Bonn 1964; D.J. GEANAKOPOLOS, Emperor Michael Paleologus and the West 1258–1282. A Study in Byzantine-Latin Relations. Hamden ²1973. Cf. also A. LAIOU, Constantinople and the Latins. The Foreign Policy of Andronicus II. 1282–1328. Cambridge, Mass. 1972, for the continuity of the Western threat under Michael's successor.

⁴⁸ LAIOU, The Palaiologoi and the World around them 805. Cf. also M. C. BARTUSIS, The Late Byzantine Army: Arms and Society, 1204–1453. Philadelphia 1992, for the military history of the period.

⁴⁹ ANGOLD, After the Fourth Crusade 754–758.

⁵⁰ A. LAIOU, Political-Historical Survey 1204–1453; in: JEFFREYS – HALDON – CORMACK (eds.), The Oxford Handbook of Byzantine Studies 285–286. On the Crusader states in the former Byzantine sphere cf. P. LOCK, The Franks in the Aegean 1204–1500. London – New York 1995.

⁵¹ Cf. J. L. ABU-LUGHOD, Before European Hegemony. The World System A.D. 1250–1350. New York – Oxford 1989, esp. 102–134.

⁵² LAIOU – MORRISSON, The Byzantine Economy 201–215 (see also below); Kl.-P. MATSCHKE, Commerce, Trade, Markets, and Money: Thirteenth-Fifteenth Century, in: A. LAIOU (ed.), The Economic History of Byzantium. From the Seventh through the Fifteenth Century. Washington, D. C. 2002, 771–806.

power of the lay aristocracy and the church, which both received land grants and tax privileges. Thus, the reign of the first three Palaiologoi (Michael VIII, his son Andronikos II, and Andronikos III) is considered a heyday of landed aristocracy.⁵³ But the demographic and economic growth period in the countryside ended in the first decades of the 14th century even before the Black Death; periods of insecurity as during the raids of the Catalan company (1302-1310) and the civil wars between Andronikos II and his grandson Andronikos III (between 1321 and 1328), which were also a kind of generation conflict within the aristocratic elite of the state, in addition brought damage to the countryside.⁵⁴ In this respect, the development of Byzantium can be set well within the general "crisis of the Late Middle Ages", as the prologue has illustrated. The 14th century brought a bundle of various crisis phenomena: the end of the "little climate optimum" of ca. 800/850-1250/1300 with a cumulation of extreme weather events (a year without summer in 1315, famines until 1322 in parts of Western Europe), the end of the demographic expansion of the previous three centuries even before the Black Death of 1346 to 1352 with a loss of population and arable land and a decline of economic and agricultural output and of trade, and (consequently) political and social unrest in wide areas of Europe.⁵⁵

In Byzantium, this great crisis fully erupted with the beginning of the civil war after the death of Andronikos III (1328–1341), whose reign had seen the loss of the most important cities in Bithynia to the Ottomans, but also territorial expansion in Epirus and Thessaly, which had incited hope for a restoration of Byzantine power at least in Europe. The period of civil wars between the pro-Palaiologan faction and the followers of John VI Kantakuzenos, formerly the most important confidant of Andronikos III, from 1341 to

⁵³ A. LAIOU, The Byzantine Aristocracy in the Palaiologan period: a story of arrested development. *Viator* 4 (1973) 131–151; K.-P. MATSCHKE – F. TINNEFELD, Die Gesellschaft im späten Byzanz. Gruppen, Strukturen und Lebensformen. Köln – Weimar – Wien 2001, 18–62; cf. also I. KARAYANNOPOULOS, Ein Beitrag zur Militärpronoia der Palaiologenzeit, in: W. SEIBT (ed.), Geschichte und Kultur der Palaiologenzeit. Referate des Internationalen Symposions zu Ehren von Herbert Hunger (Wien, 30. November bis 3. Dezember 1994). Vienna 1996, 71–89. For an overview on recent research on Late Byzantine aristocracy see also D. STATHAKOPOULOS, The dialectics of expansion and retraction: recent scholarship on the Palaiologan aristocracy. *Byzantine and Modern Greek Studies* 33 (2009) 92–101.

⁵⁴ LAIOU, The Palaiologoi and the World around them 808–810; LAIOU, Political-Historical Survey 287–288.

⁵⁵ DIRLMEIER – FOUQUET – FUHRMANN, Europa im Spätmittelalter 3–8, 41–52, 183–193; E. MEUTHEN, Das 15. Jahrhundert (*Oldenbourg Grundriss der Geschichte* 9). Munich 2006, 1–3, 18, 121–122; LIEBERMAN, Strange Parallels 77–84; BEHRINGER, Kulturgeschichte des Klimas 119–162; M. NORTH, Europa expandiert 1250–1500 (*Handbuch der Geschichte Europas* 4). Stuttgart 2007, 361–371; J. WATTS, The Making of Polities. Europe, 1300–1500 (*Cambridge Medieval Textbooks*). Cambridge 2009, 13–19, also with criticism of this "grand narrative" of the Late medieval period; Th. N. Bisson for instance writes about a "crisis" (especially in terms of politics) already for the 12th century, cf. Th. N. BISSON, The Crisis of the Twelfth Century. Power, Lordship, and the Origins of European Government. Princeton – Oxford 2009.

1354 destroyed all these hopes; it coincided with the Black Death, which, following the trade routes from the Crimea to the Mediterranean, hit Constantinople for the first time in 1347 (see also above) and returned in waves in the following decades⁵⁶, with the establishment of a short-living Serbian Empire under Stefan Dušan (who conquered Macedonia, Thessaly and Epirus), which began to disintegrate right away after Dušan's death in 1355⁵⁷, and the beginning of Ottoman expansion in Europe after their conquest of the fortress of Tzympe on the peninsular of Gallipoli in 1352. Thus, Byzantium in the second half of the 14th century became a conglomerate of small territories around cities (Thessalonike, Selymbria, the Byzantine enclave on the Peloponnese around Mistras) from which various members of the Palaiologan clan, who continued to compete for power, ruled often more or less independently from the emperor in Constantinople. The civil wars between 1341 and 1354 had been interwoven with dogmatic conflicts (debate about the hesychast theology of Gregorios Palamas) and social tensions, meaning that the cause of John Kantakuzenos was generally "backed by the landed aristocracy", while the Palaiologan party was "backed by the merchants, the sailors, and the common people, especially in the cities".⁵⁸ While the aristocratic faction won the first phase of the war in 1347 (with Ottoman support), its outcome brought an end to the heyday of landed aristocracy, since large territories and therefore aristocratic property was lost to neighbouring powers. But the dominance of aristocratic families did not decrease in the small-scale, city-based Byzantium of the last century of its existence; as Klaus-Peter Matschke has made clear, aristocratic families (and the church) had been able to expand their property rights not only in the countryside, but also in the cities under the first Palaiologoi. In addition, various noble families established commercial ties with Italian merchants, became engaged in the trading business and thus were able to maintain their aristocratic existence on this new material basis.⁵⁹ As Necipoğlu has shown in her recent

⁵⁶ Cf. BENEDICTOW, *The Black Death* 60–74.

⁵⁷ Cf. J. V. A. FINE, Jr., *The Late Medieval Balkans. A Critical Survey from the Late Twelfth Century to the Ottoman Conquest*. Ann Arbor 1994, 345–366.

⁵⁸ LAIOU, *Political-Historical Survey* 289–290; Kl.-P. MATSCHKE, *Johannes Kantakuzenos, Alexios Apokaukos und die byzantinische Flotte in der Bürgerkriegsperiode 1340–1355*, in: IDEM, *Das spätbyzantinische Konstantinopel. Alte und neue Beiträge zur Stadtgeschichte zwischen 1261 und 1453 (Byzanz, Islam und Christlicher Orient 2)*. Hamburg 2008, 307–328 (originally published in 1975); G. WEISS, *Joannes Kantakuzenos – Aristokrat, Staatsmann, Kaiser und Mönch – in der Gesellschaftsentwicklung von Byzanz im 14. Jahrhundert*. Wiesbaden 1969.

⁵⁹ Kl.-P. MATSCHKE, *Grund- und Hauseigentum in und um Konstantinopel in spätbyzantinischer Zeit*, in: IDEM, *Das spätbyzantinische Konstantinopel. Alte und neue Beiträge zur Stadtgeschichte zwischen 1261 und 1453 (Byzanz, Islam und Christlicher Orient 2)*. Hamburg 2008, 223–262, esp. 259 (originally published in 1984); LAIOU – MORRISSON, *The Byzantine Economy* 212–213; MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 158–220; HARVEY, *The Byzantine Economy in an International Context* 172;

study especially for the cities of Constantinople and Thessalonike, "consequently, in a society which became more and more characterized by commercial interests, the principal distinction that remained effective was that between the rich (including merchants, bankers, landowners) and the poor, who suffered from deep economic and social problems"; she detects a "lack of unity and social cohesion" in the Byzantine society of this period (evident for instance during the Ottoman blockades of Thessalonike before 1387 and of Constantinople between 1394 and 1402, when aristocratic entrepreneurs made profits from the general paucity), which certainly weakened its ability to find an answer to the internal crisis and the external threat of the Ottoman expansion.⁶⁰ At the same time, the "Ottoman methods of conquest", who after the surrender of a city granted safety of property and religious freedom, made "reconciliation with the Ottomans (...) popular among certain segments of the population, particularly among the lower classes"; but also members of the nobility cooperated with the Ottomans and thus were able to preserve their status within the fabric of the Ottoman state.⁶¹ This tension became again very visible during the last decades of Byzantine Empire, as the state was reduced to the de facto independently ruled Morea and Constantinople itself, when the Emperor tried to receive Western help against the Ottomans by accepting the Church Union of Florence in 1439; while in general the aristocratic families, especially those with commercial ties to the Italians, were pro-Union, the lower ranks of society, including monks, nuns and lesser folk, for whom the "preservation of their religious identity was of prime importance", were against the Union. The Byzantine state, so it may have seemed, was not only unable to maintain political and social security any more, but also to guarantee dogmatic Orthodoxy.⁶² For Anti-Unionists such as the historian Sphrantzes, the Ottoman conquest of Constantinople in 1453 was therefore a "logical" result of the political as well as

HALDON, *Social Élités, Wealth and Power* 202–203; STATHAKOPOULOS, *The dialectics of expansion and retraction*.

⁶⁰ NECIPOĞLU, *Byzantium between the Ottomans and the Latins* 41–43 (for Thessalonike), 117 (for Constantinople). Cf. also D. JACOBY, *Foreigners and the Urban Economy in Thessalonike, ca. 1150–ca. 1450*. *Dumbarton Oaks Papers* 57 (2003) 85–132.

⁶¹ NECIPOĞLU, *Byzantium between the Ottomans and the Latins* 25–37, 49. Cf. also E. WERNER, *Die Geburt einer Großmacht. Die Osmanen (1300–1481). Ein Beitrag zur Genesis des türkischen Feudalismus*. Weimar 1985; C. IMBER, *The Ottoman Empire 1300–1481*. Istanbul 1990; H. W. LOWRY, *The Nature of the Early Ottoman State*. New York 2003; K. BARKEY, *Empire of Difference. The Ottomans in Comparative Perspective*. Cambridge 2008, 28–66. Cf. also K.-P. TODT, *Kaiser Johannes VI. Kantakuzenos und der Islam: politische Realität und theologische Polemik im palaiologenzeitlichen Byzanz (Würzburger Forschungen zur Missions- und Religionswissenschaft: Zweite Abteilung, Religionswissenschaftliche Studien 16)*. Würzburg – Altenberge 1991.

⁶² NECIPOĞLU, *Byzantium between the Ottomans and the Latins* 209–220.

religious failure of the Byzantine state.⁶³ So the "Late Medieval Crisis", which in other regions of Europe led to developments which resulted in the transformation of medieval political, social and economic structures to early modern ones, proved to be fatal for the "medieval Roman state" in the East, whose imperial heir in the Eastern Mediterranean became the Ottoman Empire, one of the most successful early modern polities.

2. Macromodels of (complex) historical dynamics and the Byzantine case

This more or less conventional summary of Byzantine history on the basis of contemporary historiography very well illustrates the relevance of "crisis and transformation" for the Byzantine case. But in conformance with the programmatic introduction to this conference, we now want to ask how the framework of complexity studies, or to use a more popular term, "chaos theory" can help us to analyse and understand the development of crisis in Byzantium – and how such an analysis in return can provide insights in the emergence of and reactions to political, economic, social, etc. crises in general.

First of all, it is necessary to establish a definition of "complex systems" which is appropriate for our case: According to complexity studies, complex systems are understood as large networks of individual components, whose interactions at the microscopic level produce "complex" changing patterns of behaviour of the whole system on the macroscopic level, which are hard or almost impossibly to predict. These systems show a nonlinear character, which means that they answer to certain stimuli (actions of individuals on different scales or external influences and events, for instance) not in a linear way (which would mean that the output is proportional to its input), but because of the interactions between the parts of the system these stimuli can be reinforced (or weakened) through feedback mechanisms in an unexpected way. Change within complex systems is described as transition between alternative (more or less) stable states or "attractors".⁶⁴ "Chaos" in terms of complexity theory means that small differences in the initial state expand exponentially with time, such that the system's

⁶³ Sphrantzes XXIII, 4–6 (Giorgio Sfranze, *Cronaca*, a cura di R. MAISANO [CFHB 29]. Rome 1990, 80, 24–29); for the fall of Constantinople in 1453 see as overview S. RUNCIMAN, *Die Eroberung von Konstantinopel 1453*. Munich 1990.

⁶⁴ Cf. MAINZER, *Thinking in Complexity*; IDEM, *Komplexität (UTB Profile)*. Paderborn 2008; H. MILLER – S. E. PAGE, *Complex Adaptive Systems. An Introduction to Computational Models of Social Life (Princeton Studies in Complexity)*. Princeton 2007; M. MITCHELL, *Complexity. A Guided Tour*. Oxford 2009; cf. also L. HERBST, *Komplexität und Chaos. Grundzüge einer Theorie der Geschichte*. Munich 2004. See also S. GALAM, *Sociophysics: a personal testimony*. <http://arxiv.org/ftp/physics/papers/0403/0403122.pdf>, and Y. BARYAM, *Dynamics of Complex Systems*. <http://necsi.org/publications/dcs/index.html>.

long-term behaviour is fundamentally unpredictable, but this "unpredictable behaviour can result from completely deterministic rules". At the same times, a chaotic attractor "is always bounded. One can draw a box around it from which it will not escape. (...) the precise dynamics cannot be predicted, (but) the range of behavior can be described".⁶⁵ In mathematical terms, the transition from linear behaviour to chaos can also be visualised (see below **fig. 1**).

In the last decades, historians and social scientists who became interested in complexity theory mostly tried to use its concepts and terminology for the conceptualisation and description of phenomena in their own fields.⁶⁶ For the (Late) Byzantine history in this respect, a pioneer was Angeliki Laiou, who published a paper on "Byzantium and the Neighboring Powers: Small-state Policies and complexities" in 2006; there she stated: "The region of and around the Byzantine Empire in the Palaiologan period was a world of small powers, with all the complexities and instabilities inherent in such systems." She analyses the progressive fragmentation of political power not only in Byzantium, but in entire south-eastern Europe in the 14th century within the framework of complexity; "what is exhibited here is multipolarity, which increases the areas of instability in the system and makes it more prone to warfare." This increased instability also implied "that small events, or events that seem peripheral to the area, could lead to major upheavals: a situation that has been termed crisis instability"; and Laiou wrote "While not quite the Butterfly Effect, it does very much characterize a complex system in which small inputs can have very considerable outputs. This is, of course, the very definition of chaos, and to observe such outcomes is virtually to state that the politics of the period follow the rules of chaos theory. Equally predictable by chaos theory is the fact that some major events may have disproportionately small consequences." Finally, "the system became too burdened with small-scale units of power, fighting small-scale wars, to be sustainable. The imperative to centralize was then carried out by the Ottomans." The system had reached "the point of nonfunctionality (...), when statelets no longer have the resources or the institutions to provide elementary public services, such as the defense of their subjects, let alone the preservation of infrastructures or the assurance of

⁶⁵ M. SCHEFFER, *Critical Transitions in Nature and Society (Princeton Studies in Complexity)*. Princeton 2009, 37–54.

⁶⁶ For an illuminating application of "Chaos theory" to medieval studies see J. HATCHER – M. BAILEY, *Modelling the Middle Ages. The History and Theory of England's Economic Development*. Oxford 2001, 212–240.

provisioning."⁶⁷ This interpretation of the political and international developments of the late Byzantine history is a most illuminating example for the implementation of the complex systems approach for historical analysis; unfortunately, Laiou's premature death in 2008 impeded a further development of this approach.

More seldom, however, historians have tried to make use of the mathematical foundations of complexity theory or of quantitative tools provided by this field⁶⁸ (also Angeliki Laiou did not attempt to do this although she was also a pioneer in the field of statistical analysis of Byzantine source material⁶⁹); on the following pages, we will take into consideration both aspects of the combination of historical studies with complexity theory. We will first take a look on recently developed macro-models of complex historical dynamics, than on tools of network analysis, which allow us to inspect and quantify social formations on a micro- as well as a macro-level, and finally we will sum up our results in an attempt to describe aspects of Byzantium's crises within the complexity framework.

2.1 Demography and pre-modern history

A first kind of models recently proposed for the analysis of pre-modern historical dynamics stands in the tradition of the well-known demographic and economic theories of Thomas Robert Malthus (1766–1834) and David Ricardo (1772–1823). The Malthusian model is founded on the assumption that growth of a population is limited by the amount of resources (under pre-modern conditions mainly: arable land); if a population increases, the ratio of resources per capita and material living standards decline. At a certain point, under these deteriorating conditions, birth rates decline and death rates increase, and population numbers decline, until a more favourable ratio of resources per capita occurs and living standards increase. Then birth rates begin to

⁶⁷ A. LAIOU, *Byzantium and the Neighboring Powers: Small-state Policies and complexities*, in: S. T. BROOKS (ed.), *Byzantium: Faith and Power (1261–1557). Perspectives on Late Byzantine Art and Culture*. New York – New Haven – London 2006, 42–53, esp. 49–52. Yet, one has to ask where the differences to other regions of Europe lay, since "Kleinstaaten in fact resembled the commonest pattern of territorial power in Europe", as John Watts states, cf. WATTS, *The Making of Polities* 127.

⁶⁸ An example in this respect is J. BINTLIFF, *Catastrophe, chaos and complexity: the death, decay and rebirth of towns from antiquity to today*, in: E. OLSHAUSEN - H. SONNABEND (eds.), *Stuttgarter Kolloquium zur Historischen Geographie des Altertums 6, 1996: Naturkatastrophen in der antiken Welt* (Geographica Historica 10). Stuttgart 1998, 417–438.

⁶⁹ Cf. A. E. LAIOU-THOMADAKIS, *Peasant Society in the Late Byzantine Empire. A Social and Demographic Study*. Princeton, New Jersey 1977. For a critical review of the book cf. P. KARLIN-HAYTER, *Byzantion* 48 (1978) 580–585, and IDEM, *Preparing the Date from Mount Athos for Use with modern Demographic Techniques*. *Byzantion* 48 (1978) 501–518, for Karlin-Hayter's own attempt at statistical analysis of the material.

increase, death rates decline and the population increases until the "Malthusian Trap" of limited resources closes again. David Ricardo independently introduced his famous "Law of Diminishing Returns", which holds, that if one of the inputs to a production system is fixed (in an agrarian society: the amount of arable land), then "employing more of any of the other inputs (say: human workforce) will increase output, but by progressively smaller increments; (...) average output per worker would fall as the labour supply increased" (although the total output still increases); "consequently average material income per person fell with population growth." According to the model, also technological or cultural innovations (which increase the productivity per unit of arable land or decrease female fertility by delaying marriage, for instance) or the expansion of the amount of resources (by colonising uncultivated land, for instance) can only delay the closing of the trap, since population numbers will continue to increase until the new limit. As can be easily understood, the Malthusian-Ricardian model produces cycles of growing population/decreasing living standards and declining population/increasing living standards. The model has been used for the analysis of pre-modern societies until the present day; even in his 2007 "Brief Economic History of the World", Gregory Clark states: "the Malthusian model is an accurate description of all societies before 1800".⁷⁰ For the analysis of demographic and economic trends in medieval Western Europe, the German historian of economy Wilhelm Abel (1904–1985) in his classic work on "Agrarkrisen und Agrarkonjunktur in Mitteleuropa vom 13. bis zum 19. Jahrhundert" (originally published in 1935), Emmanuel Le Roy Ladurie for France and Sir Michael Postan (1898-1981) for England have made use of the Malthusian model (Abel, especially in the later editions of his book, in a very critical way⁷¹). They identified a time where population numbers reached the Malthusian limit at the turn from the 13th to the 14th century after a period of increasing population growth from the 10th century onwards; the outcome was, according to them, an

⁷⁰ G. CLARK, A Farewell to Alms. A Brief Economic History of the World (*The Princeton Economic History of the Western World*). Princeton – Oxford 2007, 19–39 (from there also the citations); W. PETERSEN, Malthus. London 1979, 135–217; HATCHER – BAILEY, Modelling the Middle Ages 21–30; J. LANDERS, The Field and the Forge: Population, Production, and Power in the Pre-Industrial West. Oxford 2003, 19–46 (with the figure on p. 37), especially also on "demographic cycles" in European history; cf. also A. CHAMBERLAIN, Demography in Archaeology (*Cambridge Manuals in Archaeology*). Cambridge 2006, 19–23; J. MOKYR – H.-J. VOTH, Understanding Growth in Europe, 1700–1870: Theory and Evidence, in: St. BROADBERRY – K. H. O'ROURKE (eds.), The Cambridge Economic History of Modern Europe, Volume 1: 1700–1870. Cambridge 2010, 13–21, and P. MALANIMA, Europäische Wirtschaftsgeschichte. 10.–19. Jahrhundert. Vienna – Cologne – Weimar 2010, 31–54.

⁷¹ W. ABEL, Agrarkrisen und Agrarkonjunktur. Eine Geschichte der Land- und Ernährungswirtschaft Mitteleuropas seit dem hohen Mittelalter. Hamburg – Bremen ³1978, 15–17.

overpopulation crisis, which resulted in a decrease of population because of the adverse conditions, aggravated by deteriorating climatic conditions (inducing famines between 1315 and 1322) and finally ending in the demographic collapse caused by the Black Death after 1347, whose diffusion was favoured by developments of the preceding growth period – an increase in trading connections and a decrease of living conditions for the mass of the population. Especially the well-documented English case, where, depending on the estimates, the population between 1100 and 1300 increased from between 1.5 and 2.5 million to between 4 and 6 million, where in the 12th and 13th century more and more land, also of less quality, was colonised, where statistical analysis of sources shows for some regions a picture of an increasing number of peasant households living on smaller and smaller landholdings (below the minimum considered necessary to provide for the basic needs of an average family), of rising grain and land prices and rising rents for the landlords who possessed the scarce resource of arable land, and of falling wages, since manpower was abundant, seems to support the Malthusian model. As John Hatcher and Mark Bailey in their book on "Modelling the Middle Ages" state: "The case for a demographic downturn along Malthusian lines around c. 1300 has been argued so many times that it has become something of an orthodoxy."⁷² Also for the Byzantine case, a "Malthusian impasse" has been proposed by Angeliki Laiou for the late thirteenth and early 14th century, following the above mentioned growth period since the 10th century (which, as can be documented for Macedonia, included the clearance of uncultivated land and the establishment of new settlements); Laiou stated on the basis of her analysis of tax registers (*praktika*) for various villages in Macedonia, which were in the possession of monasteries of Mount Athos, that rural population was declining in the first half of the 14th century even before the plague, and that also the economic situation of the peasant households was deteriorating.⁷³ But Laiou herself was more cautious regarding a possible "Malthusian" mechanism in her earlier survey of the Late Byzantine Agricultural Economy in the "Economic History of Byzantium" (2002), where she wrote:

⁷² HATCHER – BAILEY, *Modelling the Middle Ages* 30–52; B. M. S. CAMPBELL, *English Seignorial Agriculture 1250–1450 (Cambridge Studies in Historical Geography 31)*. Cambridge 2000, 1–25; Ch. DYER, *Making a Living in the Middle Ages. The People of Britain 850–1520 (The New Economic History of Britain)*. New Haven – London 2002, 228–263, esp. 246–251. Cf. also DIRLMEIER – FOUQUET – FUHRMANN, *Europa im Spätmittelalter* 16–21, 158–168; MEUTHEN, *Das 15. Jahrhundert* 3–5, 9–11, 122–124; NORTH, *Europa expandiert* 361–365; WATTS, *The Making of Politics* 13–19; LANDERS, *The Field and the Forge* 23–24.

⁷³ LAIOU – MORRISSON, *The Byzantine Economy* 169–170; LAIOU, *The Palaiologoi and the World around them* 817–818.

"Is this a crisis of overexpansion? It has been argued that this was, indeed, the case, and that the expanded population had moved into marginal lands, which produced correspondingly lower revenues. This is undoubtedly so in villages with dense settlement; but there were also villages where land was abundant. It must also be noted that there was, in this period, pressure on the peasants to sell their lands and vineyards, not to other peasants but to great landed proprietors, whether lay or ecclesiastic. There was, however, no increase in the price of land. Peasants sold at low prices, and the fact that the price of land in the countryside remained stable, or even decreased if the devaluation of the coinage is taken into account, suggests that there was no major overall demographic pressure. The impoverishment of the peasantry might also be sought in social and economic factors, primarily in the fact that a significant number of them owned no oxen and no arable land, which, even though there were ways to compensate for it to some extent, was, nevertheless, not conducive either to increase of wealth or to stability. Thus, although some villages (the prime example is Radolibos) were very close to the limit of their possibilities as far as population was concerned, in other areas the available arable land went begging for labor. There was a certain competition among landlords for peasant labor. The *eleutheroi*, poor peasants, some of whom worked as day laborers, were in demand, and a number of grants of land include clauses regarding the right of the grantee to install peasants on his land, should he be able to find them. (...) Around the middle of the fourteenth century, there was a precipitous demographic decline in Macedonia. Villages were abandoned (...); others fell to the population levels of the early twelfth century. Cultivated land returned to fallow, and the vegetation of the hillsides was regenerated. The reasons for this decline were many. If there was a secular downward trend before 1341, no doubt it contributed significantly to the decline. But there were also catastrophic causes. In the first decade of the fourteenth century, the Catalan raids had caused disruption and dislocation, with some demographic effects which, however, were localized. Similarly, periodic invasions by the Serbs in Macedonia (in the 1280s and the 1290s) and the Tatars in Thrace in 1320, 1321, and 1324, and the first civil war between Andronikos II and Andronikos III (1321–28), must have had very destructive short-term effects. The situation, however, became unrelieved after 1341. Insecurity increased exponentially because of the great civil war. John Kantakouzenos' Serbian allies were explicitly out for booty, while his Turkish allies took not only booty but also slaves. Finally, there was the plague of 1347 (...) Although its effects on the countryside can only be surmised, it is safe to assume that it was an important factor in the evident depopulation, especially since it recurred throughout the rest of the century." ⁷⁴

Thus, although there may have been also "Malthusian" mechanisms at work in 13th/14th century Byzantium, Angeliki Laiou here points at the relevance of "social and economic factors", such as the relationship between great landowners and peasants, and of external factors (invasions, etc.) which affected the material situation of the majority of the population beyond the possible pressures of demography. For Western medieval studies, these issues were intensively discussed in the 1970s and 1980s in the so-called "Brenner Debate", which broke out because of Robert Brenner's (Marxist) criticism of

⁷⁴ A. E. LAIOU, *The Agrarian Economy, Thirteenth-Fifteenth Centuries*, in: IDEM (ed.), *The Economic History of Byzantium. From the Seventh through the Fifteenth Century*. Washington, D. C., 2002, 316–317.

the "Neo-Malthusian Orthodoxy" (as Guy Bois has called it) of Postan, Le Roy Ladurie and others, against whose demographic determinist interpretation of pre-modern economic and social development he pointed at the (in turn, for him universal) relevance of "social-property relationships and balances of class forces".⁷⁵ Although also Brenner's mono-causal interpretation did not find general acceptance, the importance of the socio-economic and institutional framework such as the relationship between an aristocratic elite and the majority of the population for the various effects underlying demographic trends (which in turn are influenced by this framework) can have on a society seems evident. Stephan R. Epstein for instance, who even doubts the existence of a "generalised European crisis before the Black Death", ascribes what he calls "the late medieval integration crisis" and the "economic slowdown" to an "institutionally induced crisis of distribution"; institutional frameworks (certain patterns of landholding for instance) hindered a further expansion of trade or a more effective usage of land. In some regions of Europe,

"the fourteenth-century pandemic turned a comparatively smooth evolutionary process into a wave of Schumpeterian creative destruction driven by heightened political and economic struggle. Supported by a wealthier peasant elite whose bargaining powers were inflated by the shortage of labour, and by many urban elites who stood to gain from weaker feudal rights and levies, aspiring rulers increased the jurisdictional integration of their territories, making markets more competitive, stimulating commercialisation and setting the stage for the long sixteenth-century boom".⁷⁶

Thus, also in this interpretation, the long term effects of the 14th century crisis could be positive, if the system adapted to the circumstances in a way which produced positive feedback mechanisms; but this was not the case in all polities affected by the crisis.

Recently, this has been illustrated by Stuart J. Borsch in his comparative study on the effects of the Black Death on the socio-economic development of England and Mamluk

⁷⁵ Cf. R. BRENNER, *Agrarian Class Structure and Economic Development in Pre-Industrial Europe*, in: T. H. ASTON – C. H. E. PHILPIN (eds.), *The Brenner Debate. Agrarian Class Structure and Economic Development in Pre-Industrial Europe*. Cambridge 1985, 10–63, esp. 23, G. BOIS, *Against the Neo-Malthusian Orthodoxy*, *ibid.* 107–118, and the other papers reprinted in this volume; HATCHER – BAILEY, *Modelling the Middle Ages* 52–65. Cf. also DIRLMEIER – FOUQUET – FUHRMANN, *Europa im Spätmittelalter* 16–21, 158–168; MEUTHEN, *Das 15. Jahrhundert* 3–5, 9–11, 122–124; NORTH, *Europa expandiert* 365–367; WATTS, *The Making of Polities* 16–19. On the relevance of institutional frameworks cf. also A. GREIF, *Institutions and the Path to the Modern Economy. Lessons from Medieval Trade*. Cambridge 2006; MOKYR – VOTH, *Understanding Growth in Europe* 21–36.

⁷⁶ S. R. EPSTEIN, *Freedom and Growth. The rise of states and markets in Europe, 1300–1750* (*Routledge Explorations in Economic History* 17). London – New York 2000, 38–72, esp. 55; NORTH, *Europa expandiert* 367–369. On the concept of "creative destruction" popularized by the famous Austrian Economic Joseph Schumpeter (1883–1950) cf. J. A. SCHUMPETER, *Capitalism, Socialism and Democracy*. New York 1975 (Reprint), and also St. THURNER – P. KLIMEK – R. HANEL, *Schumpeterian economic dynamics as a quantifiable minimum model of evolution*. 2009 (<http://arxiv.org/abs/0909.3482v1>).

Egypt, which both suffered a comparable loss of population in the mid-14th century; whereas in England after a period of general contraction the material conditions of the population improved and population numbers and agrarian productivity began to increase in the 15th century (as also the Malthusian model would have predicted), population, agrarian output and living conditions in Egypt further declined. Borsch points out the (according to him) main cause for this divergence: English landholders, who, in relation to their Egyptian counterparts, even before the Black Death had "had a much more direct economic interest in the welfare and management of their estates, which they retained on a long-term basis (...), failed in their efforts to collectively confront a scarce rural labor market" and "to intensify the mechanisms of coercive surplus-extraction", and therefore had to accept lower rents for their land, higher wages for labour, etc.; "economic opportunities for those below the top of the social pyramid thus expanded, and this created a cycle of positive feedback". Among the Egyptian Mamluks, on the contrast, "landholding was nonhereditary, short-term, and constantly subject to the winds of political and military fortune" (with a high level of intra-elite competition), which created a "pressure to maximize short-term profits from the estate"; and in contrast to their English counterparts, they were able to "collectively force" this constantly high level of surplus-extraction also on the reduced agrarian population after the Black Death, but at long-term costs of further deteriorating material conditions, of the fragile irrigation system and of the agrarian output of the land, thus leading to long-term demographic depression.⁷⁷ Thus, the variety of regional outcomes of the Late medieval crisis indicates a higher degree of historical complexity than the pure (Neo-)Malthusian model does and highlights the relevance of institutions.

2.2 Cyclic crises in Byzantium?

The combination of the Malthusian factors with the effects of "social-property relationships" and the feedbacks between these elements already show characteristics of a "complex system". Recently, attempts have been made to establish a mathematical

⁷⁷ St. J. BORSCH, *The Black Death in Egypt and England. A Comparative Study*. Austin 2005, 24–66, and 113–117. Borsch's analysis shows strong borrowings from the model Guy Bois has developed for the Normandy, cf. G. BOIS, *Crise du féodalisme*. Paris 1976, and NORTH, *Europa expandiert* 365–366 (for an useful summary of Bois' model). On the Mamluk state during this period cf. also R. IRWIN, *The Middle East in the Middle Ages: the Early Mamluk Sultanate, 1250–1382*. Carbondale – Edwardsville 1986, 125–151; U. HAARMANN, *Der arabische Osten im späten Mittelalter 1250–1517*, in: IDEM (ed.), *Geschichte der arabischen Welt*. Munich ³1994, 217–257, esp. 247–250; on the development in England after the Black Death cf. DYER, *Making a Living in the Middle Ages* 271–297, 330–362.

model in order to integrate these factors in one framework; much attention received the work of Peter Turchin⁷⁸, Professor of Ecology and Evolutionary Biology at the University of Connecticut; therefore, a thorough discussion of his theses from a historian's point of view seems necessary, especially with regard to the adequacy of his model for the explanation of historical dynamics; at the same time, his model of cyclic crises shows similarities with still used models for the description of modern day "economic cycles" of various lengths (Kondratjew waves of 40 to 60 years length for instance, or business cycles of several years length).⁷⁹

The core of Turchin's framework is his "demographical-structural theory", for which he developed further concepts which he borrowed from the 14th century Arab historian Ibn Khaldun and the American sociologist Jack A. Goldstone.⁸⁰ Also according to this theory, the internal stability of a pre-modern state depends primarily on the dynamics of its population, more precisely on the number of producers and of members of the elite. But the growth of the producing population depends not only on the "Malthusian" constraints of pre-modern agriculture, but also on the demands of the elite; high population numbers and especially high numbers of elite members lead to socio-economic instability, to higher intra-elite competition and finally to civil war or even state breakdown which in turn effect population decline until balance within the system is restored.⁸¹ For population dynamics, Turchin established a logistic model developed by Pierre François Verhulst (1804–1849) for the growth of a population at limited resources; thus:

$$\Delta N / \Delta t = rN(1 - N/k) \quad (1)$$

⁷⁸ P. TURCHIN, *Historical Dynamics. Why States Rise and Fall (Princeton Studies in Complexity)*. Princeton, New Jersey 2003. Cf. also his website <http://cliodynamics.info/>.

⁷⁹ Cf. B. FELDERER – St. HOMBURG, *Makroökonomik und neue Makroökonomik*. Köln 2005, 176–177, 248; A. E. FREIER, *Multi-Kondratieff-Zyklen in der chinesischen Wirtschaftsgeschichte. Eine holistische Theorie über die innovatorisch-iterative Evolution, die Entwicklungsfähigkeit und die Autopoiese volkswirtschaftlicher Systeme*. Marburg 2007, 143–194, 241; W. PLUMPE, *Wirtschaftskrisen. Geschichte und Gegenwart*. Munich 2010, 7–26.

⁸⁰ Cf. Ibn Khaldun, *The Muqaddimah. An Introduction to History*, transl. by F. ROSENTHAL. Princeton – Oxford 2005; J. A. GOLDSTONE, *Revolution and Rebellion in the Early Modern World*. Berkeley 1991, esp. 24–39 and 104–142 (on the development of the model for 16–17th century England).

⁸¹ TURCHIN, *Historical Dynamics* 118–149; IDEM – A. V. KOROTAYEV, *Population Dynamics and Internal Warfare: A Reconsideration. Social Evolution and History* 5/2 (2006) 112–147; IDEM, *Long-Term Population Cycles in Human Societies. The Year in Ecology and Conservation Biology* 2009, 1–17, also for the following equations (downloads of most of Turchin's papers can be found on his website <http://cliodynamics.info/>).

where N is the population number, r is the rate of population growth and k is the “carrying capacity” (or maximal population size limited by the resources).⁸² For the resources of the state, S , Turchin proposed a comparably simple differential equation in dependence of the population dynamics:

$$\Delta S / \Delta t = \rho N (1 - N/k) - \beta N \quad (2)$$

where ρ is the per capita taxation rate and β the per capita state expenditure rate (for army, administration etc.). Finally, Turchin added an even simpler model for the intensity of internal warfare and instability, W , which, as he confesses, in “a very crude analogy”, is “the rate at which each individual bumps” into others, and therefore proportional to the square of N , while it declines at the rate b and proportional to the state resources with the rate α ; therefore:

$$\Delta W / \Delta t = aN^2 - bW - \alpha S \quad (3)$$

To complete his model, Turchin then included a “feedback loop from W to N ” in the form of an “extra mortality term” (δNW) for the equation of N and a negative effect of W on the “carrying capacity” k ($k_{(W)} = k_{\max} - cW$), thus resulting in the modified differential equations for N and S :

$$\Delta N / \Delta t = rN (1 - N / [k_{\max} - cW]) - \delta NW \quad (4)$$

$$\Delta S / \Delta t = \rho N (1 - N / [k_{\max} - cW]) - \beta N \quad (5)$$

Using his proposed parameter values (“realistic values of r ” between 0.01 and 0.02 per annum, for instance), Turchin’s model produces cycles of the rise and decline of population number, state power and internal instability with a duration of 150 to 300 years; therefore, he calls them “secular cycles” (see **fig. 2** and **3**).⁸³

⁸² On calculation on the „carrying capacity“ for pre-modern populations cf. also E. LO CASCIO – P. MALANIMA, Cycles and Stability. Italian Population before the Demographic Transition (225 B. C.–A. D. 1900). *Rivista di Storia Economica* 21/3 (2005) 19–20.

⁸³ TURCHIN, Historical Dynamics 150–169. This is also the title of his second book-length study on these models together with Sergey A. Nefedov: P. TURCHIN – S. A. NEFEDOV, Secular cycles. Princeton – Oxford 2009, esp. 1–34. For an overview on the theory see also P. TURCHIN, Long-Term Population Cycles in Human Societies. <http://cliodynamics.info/PDF/RevSEC.pdf>.

In order to test this model, Turchin needed data on the development of population, the size of the state's elite (or state income) and the occurrence of instability within a pre-modern state. Turchin made use of what he considered "the best data set: the population history of England and Wales between 1080 and 2000 C.E.", augmented by data on the number of English aristocrats and a so-called "instability index", which measured the years of socio-political instability or the numbers of "instability events" per decade through the centuries; the same he did for ancient and medieval China, from where we actually possess census data since the year 2 AD.⁸⁴ Subsequently, Turchin and his colleague Sergey A. Nefedov looked for "secular cycles" in medieval and early modern France, but also in statistically less well documented periods such as late medieval and early modern Russia or Republican and Imperial Rome⁸⁵; in order to have a statistical basis, they used other data such as the temporal distribution of temple building activity or the number of coin hoards per decade as indicators for stability or instability⁸⁶ – but as one reviewer has stated, this data (often punctual data with only estimated trajectories between them) is clearly of "questionable reliability"⁸⁷. And even "the best data set" for medieval England should have been used with great caution, since there is a relatively wide range of alternative population estimates.⁸⁸ Still, the overall trends in chosen data could be interpreted in a way which supports the validity of the Turchin-Nefedov-model.

But what about Byzantium? Various scholars provide some very rough estimates for population figures, but since we possess no evidence of an empire-wide census and documents only for some villages in 14th century Macedonia for instance⁸⁹, "it is not possible to procure exact population figures at any time for any territory within the

⁸⁴ TURCHIN, *Historical Dynamics* 155; TURCHIN – NEFEDOV, *Secular cycles* 35–80; TURCHIN – KOROTAYEV, *Population Dynamics and Internal Warfare*. On the Chinese data cf. J. D. DURAND, *The Population Statistics of China, A.D. 2–1953*. *Population Studies* 13/3 (1960) 209–256, on its problematic aspects cf. K. G. DENG, *Unveiling China's True Population Statistics for the Pre-Modern Era with Official Census Data*. *Population Review* 43/2 (2004) 32–69.

⁸⁵ Cf. TURCHIN – NEFEDOV, *Secular cycles* 81–302. For the population trajectory of ancient and medieval Italy cf. also LO CASCIO – MALANIMA, *Cycles and Stability* 5–40 (with an alternative demographic-economic model).

⁸⁶ Cf. also P. TURCHIN – W. SCHEIDEL, *Coin hoards speak of population declines in Ancient Rome*. *PNAS* 106/41 (2009) 17276–17279 (http://cliodynamics.info/PDF/HoardCens_PNAS.pdf).

⁸⁷ N. BONNEUIL, *Review in History and Theory* (May 2005) 266; cf. also J. A. TAINTER, *Review in Nature* 427/No. 6974 (2004). http://www.nature.com/cgi-taf/DynaPage.taf?file=/nature/journal/v427/n6974/full/4274_88a_fs.html.

⁸⁸ CAMPBELL, *English Seignorial Agriculture* 407 (Table 8.07), and HATCHER – BAILEY, *Modelling the Middle Ages* 29 (fig. 2).

⁸⁹ See LAIOU-THOMADAKIS, *Peasant Society in the Late Byzantine Empire*; IDEM, *The Human Ressources*, and IDEM, *The Agrarian Economy*, in: IDEM (ed.), *The Economic History of Byzantium* 47–55 and 311–375.

realm of (...) the Byzantine state", as Johannes Koder has stated.⁹⁰ Sergey A. Nefedov in his book on the "Analysis of historical processes" tried to identify secular cycles in the Byzantine history on the basis of the frequency of coin findings from various archaeological sites⁹¹; of course, these data could be used as indicators for the intensity of economic exchange, and the above mentioned absence of copper coins in the findings from various city for the period of 650 to 850 AD also converges with the economic and demographic decline in this period (yet recent research on coin findings from Anatolia could indicate a relocation of commercial exchange from the cities to the countryside in accordance with the ruralisation of the economy and the realignment of troops across the provinces⁹²). But as in Byzantium the state for the most time of its history was the sole provider of coins and as coinage until the 11th century primarily served its purposes – the payment of army, administration and the collection of taxes –, an intensified circulation of coinage could also be caused by actions at military hotspots; larger numbers of coins were equally deposited by people in the earth in time of higher instability.⁹³ The interpretation of the data used by Nefedov is therefore ambiguous (increased coin findings could indicate economic growth as well as increasing instability) and it should be analysed very carefully for each region and period.

But one could attempt to bring the above mentioned estimates on demographic trends in Byzantium in agreement with the Turchin-Nefedov-model: the "Principate Cycle" of Imperial Rome is dated by them to 30 BC-285 AD; therefore, a following secular cycle (a "Dominate" one?) should have lasted from ca. 300 to 600 AD. Actually, there definitely was a significant demographic caesura in the 6th century, but this was marked by the Justinianic plague (see above)⁹⁴, and it is hard to decide if mechanisms such as those described by Turchin and Nefedov played a part in it. One could then propose that the recurring outbreaks of the plague and external invasions delayed the starting of a new "secular cycle" of growth and depression until the time around 850/900 AD; therefore, a

⁹⁰ J. KODER, *Der Lebensraum der Byzantiner. Historisch-geographischer Abriß ihres mittelalterlichen Staates im östlichen Mittelmeerraum (Byzantinische Geschichtsschreiber, Ergänzungsband 1)*. Nachdruck mit bibliographischen Nachträgen, Wien 2001, 150; cf. also D. STATHAKOPOULOS, *Population, Demography, and Disease*, in: E. JEFFREYS – J. HALDON – R. CORMACK (eds.), *The Oxford Handbook of Byzantine Studies*. Oxford 2008, 309–316.

⁹¹ S. A. NEFEDOV, *Факторный анализ исторического процесса. история востока*. Moscow 2008, 411–439 and 469–482.

⁹² AUZÉPY, *State of Emergency* 270; WHITTOW, *The Middle Byzantine Economy* 483–485.

⁹³ C. MORRISSON, *Byzantine Money: Its Production and Circulation*, in: A. E. LAIOU (ed.), *The Economic History of Byzantium. From the Seventh through the Fifteenth Century*. Washington, D. C. 2002, 909–966 (also with data on coin findings from various cities) and N. OIKONOMIDES, *The Role of the Byzantine State in the Economy*, in: *ibid.*, 973–1058; HALDON, *Social Élites, Wealth and Power* 198.

⁹⁴ Cf. also LANDERS, *The Field and the Forge* 23.

next cycle (the “Macedonian” one?) should have covered the period of ca. 900–1200 AD. The time around 1200 definitely was marked by internal (and external) instability, culminating in the Fourth Crusade, but the demographic trend for the remaining South-eastern European provinces of the Empire seems not in accordance with the model of Turchin, since growth most probably continued until the period around 1300. We may argue that in these regions the cycle only started after the end of the Bulgarian wars of Basil II in 1018, therefore, it would have lasted from ca. 1000/1020 to 1300/1320 AD. For the first half of the 14th century, as mentioned above, a “Malthusian impasse” has been proposed, and at the same time it was characterised by increasing internal instability; these phenomena (whose interpretation, as we have seen, is however disputable) could be interpreted as indicators for the validity of the Turchin-Nefedov-model in Byzantium.

It seems also possible to construct something like an instability index for Byzantium after Turchin’s example. Helpful lists of rebellions, usurpations, etc. can be found in the works of Friedhelm Winkelmann for the 8th and 9th century and of Jean-Claude Cheynet for the 10th to 13th century, for instance.⁹⁵ But one has to ask which instability-events should be interpreted as symptoms of an underlying general crisis dynamics – a rebellion in a small provincial town provoked by a greedy local tax official, for example? In Turchin’s studies, this question is not answered. We introduced some kind of threshold in order to include only over-regional and instability phenomena of wider significance in our list. Our instability index (see **fig. 4**) for Byzantium begins where Turchin’s index for Rome ends in 280 AD and ends in the year 1400, since the small size of the Byzantine polity after the middle of the 14th century raises some doubts on the applicability of the model which Turchin developed for “large scale agrarian empires”.⁹⁶ As a look at the graph shows, again we could identify several of Turchin’s secular cycles for the Byzantine instability trajectory if we choose various 200–300 years periods, for the time from 1150 to 1400 AD for instance (see **fig. 5**); but these instability periods do not always correspond with demographic trends (as far as we can reconstruct them) in a way as predicted by the Turchin-model; the 11th century for instance presumably was a

⁹⁵ F. WINKELMANN, Quellenstudien zur herrschenden Klasse von Byzanz im 8. und 9. Jahrhundert (*Berliner Byzantinistische Arbeiten* 54). Berlin 1987, 34–35; J.-Cl. CHEYNET, Pouvoir et contestations à Byzance (963–1210) (*Byzantina Sorbonensia* 9). Paris 1996, 19–156. For the remaining centuries, the data was collected from standard literature on Byzantine history.

⁹⁶ Cf. also P. TURCHIN, Dynamical Feedbacks between Population Growth and Sociopolitical Instability in Agrarian States. *Structure and Dynamics: eJournal of Anthropological and Related Sciences* 1/1 (2005) Article 3. <http://escholarship.org/uc/item/0d17g8g9>.

period of economic and demographic growth and yet also a peak of instability (even before 1071).

Overall, since we do not possess any corresponding data on the "exact" population trajectory or other elements of Turchin's demographic-structural framework, a detailed "evaluation" of the model as it has been done for England, France, etc. seems impossible. More interesting seems the observation (also indicated with the trend line, see **fig. 4**) that the intensity of instability grew during this long period of more than 1000 years; but this phenomenon may as well depend on the larger number of sources which we possess for the later centuries of Byzantine history (an aspect which Turchin also did not take into consideration).⁹⁷

But Turchin and Nefedov claim on the basis of the historical cases for which the data they have made use of apparently shows cyclic trajectories that their model captures essential elements of socio-historical dynamics in all pre-modern societies. Thus, it should also be valid for Byzantium. Yet, a primary weakness of Turchin's demographic-structural model (as he himself confessed) not only, but especially with regard to the Byzantine case is that it very much ignores external influences on the system such as foreign invasions, climate changes or plagues, phenomena, which seem very relevant for the development of Byzantium. Therefore we modified the basic demographic-structural model as presented above and introduced into the equations (3, 4, and 5) randomised influences on the reproduction rate (r) of the population (to "simulate" external invasions, plagues, etc.), on the constraints of population because of the productive area (territorial losses or gains) and on the limitations of the ability of the state to exploit the population (strong and weak regimes).

As **figures 6 to 8** indicate, the model still produces "secular cycles" for population number, state income and internal warfare, if the parameters change randomly within a range that seems "realistic", but the length and intensity of these cycles varies to a much stronger degree than in the "pure" Turchin-model; at the same time, internal warfare occurs only at turning points between two cycles, and the trajectories for W (see **fig. 9 to 11**) look somewhat monotonous in comparison with our instability index for Byzantium. An interesting (and somewhat "unrealistic") feature of the model which we have detected is that it needs a constant minimal per capita taxation rate ρ even in the

⁹⁷ On the increase of writing and written records from the 11th to the 14th century in England cf. M. T. CLANCHY, *From Memory to Written Record. England 1066–1307*. Malden – Oxford ²1993, 44–80 (a more than tenfold increase in the number of regal letters per year between 1066 and 1200, for instance).

absence of the state (if $S = 0$) in order to maintain a cyclic trajectory; if we introduce the condition that $\rho = 0$ if $S = 0$, state collapse becomes permanent, and the population number stagnates at a low level (see **fig. 12**). In order to start a new cycle of surplus extraction and state formation, the system would need an external "kick-off" factor. This again indicates the limitations of the model, especially with regard to external factors; as in the case of the Malthusian trap, the model, although of course a high degree of simplification has to be accepted⁹⁸, lacks essential elements of historical dynamics. John Hatcher's and Mark Bailey's verdict on the "classic" macro-models of medieval demographic and economic history may also be valid for Turchin's attempt: "The foundations on which each grand model is built, and the methods by which it proceeds, are essentially far too crude. At best they might be applicable to very simple systems, but modern research has confirmed that the medieval economy was relatively complex and that it operated within a sophisticated environment."⁹⁹ And the renowned French historical demographer Noël Bonneuil has stated in his review of Turchin's first book: "it is one thing to create possible scenarios; it is another to believe that such scenarios, dependent on arbitrary values of five parameters, have more general explanatory power." And instead of "secular cycles", science observes "broken threads, sudden switches from one regime to another, temporary stagnations, discontinuity, unexpected futures" in demographic history.¹⁰⁰

That history is more "noisy" than the equations of the model, of course Turchin himself would confess; still, he considers the long-term cyclic dynamics which his model indicates a decisive underlying factor of pre-modern history. But we know since the writings of Fernand Braudel (1902–1985), for instance, that historical phenomena can take place at "durées" of different scale.¹⁰¹ Even developments of presumably "long durée" such as demography can be influenced by short-term events or of events of much higher frequency than "secular cycles"; an analysis of chronicles from the Kievan Rus for instance showed that a hunger crisis occurred on average all 7.5 years between 1024 and 1332; and a similar survey for the region of Forez in France indicates a frequency of

⁹⁸ Cf. M. BUCHANAN, *The Social Atom. Why the Rich get richer, Cheaters get caught, and your neighbor usually looks like you*. New York 2007, 163: models are always simplifications, but they are successful "if they get right the few details that really matter".

⁹⁹ HATCHER – BAILEY, *Modelling the Middle Ages* 209.

¹⁰⁰ BONNEUIL, *Review* 265–266.

¹⁰¹ Cf. F. BRAUDEL, *Geschichte und Sozialwissenschaften. Die longue durée*, in: Cl. HONEGGER (ed.), *Schrift und Materie der Geschichte. Vorschläge zu einer systematischen Aneignung historischer Prozesse*. Frankfurt am Main 1977, 47–85; WATTS, *The Making of Politics* 39.

1.94 years of famines for the time between 1277 and 1343 (as the "late medieval crisis" began).¹⁰² At the same time, historical demographic research demonstrates that famines, epidemic diseases or conflict mortality did not affect all age groups in the same way, but have age-specific effects on the composition of a population and therefore of course also on future rates of marriage, fertility etc.¹⁰³; as Bonneuil has stated and also the research at the Vienna Institute of Demography (VID) of the Austrian Academy of Sciences makes clear, simple models cannot capture these dynamics.¹⁰⁴

The same of course holds true for another decisive factor, which takes places on different time scales and which has been one of the first fields of complexity research: climate.¹⁰⁵ As we have seen, long term climatic trends influenced the demographic and economic development¹⁰⁶, but also short-term weather phenomena could have strong effects and were registered by Byzantine contemporaries, as Ioannis G. Telelis has demonstrated in various recent studies; at the same time, these phenomena and trends had different effects on different regions and their ecology.¹⁰⁷ This is true not only for regions within the Byzantine Empire¹⁰⁸, but also for all neighbouring areas, whose climatic, demographic and economic development in return of course affected Byzantium; Johannes Koder for instance made an important point with regard to the migration waves climatic changes caused in Central Asia in the 10 and 11th century, which had severe effects on Byzantium.¹⁰⁹ In a similar way, positive climatic, demographic and economic developments in Western Europe brought for Byzantium from the 11th century onwards the "problem of survival in a world where weak, wealthy

¹⁰² DIRLMEIER – FOUQUET – FUHRMANN, Europa im Spätmittelalter 164–165.

¹⁰³ Cf. CHAMBERLAIN, Demography in Archaeology 64–80; Ch. PFISTER, Bevölkerungsgeschichte und Historische Demographie 1500–1800 (*Enzyklopädie Deutscher Geschichte* 28). Munich 2007, 32–44.

¹⁰⁴ Cf. various papers at <http://www.oeaw.ac.at/vid/publications/publications.shtml>.

¹⁰⁵ Cf. for instance MAINZER, Thinking in complexity 54–56, on the pioneering research of Edward Lorenz (1917–2008) in the field of climatic dynamics and chaos (development of the "Lorenz-attractor")

¹⁰⁶ For another macro-model of climate, demography and warfare cf. D. D. ZHANG – P. BRECKE – H. F. LEE – Y. –Q. HE – J. ZHANG, Global climate change, war, and population decline in recent human history. *PNAS* 104/79 (2007) 19214–19219.

¹⁰⁷ Cf. I. G. TELELIS, Climatic Fluctuations in the Eastern Mediterranean and the Middle East AD 300–1500 from Byzantine Documentary and Proxy Physical Paleoclimatic Evidence – a Comparison. *Jahrbuch der Österreichischen Byzantinistik* 58 (2008) 167–207, with further references. Cf. also W. S. ATWELL, Volcanism and Short-Term Climatic Change in East Asian and World History, c. 1200–1699. *Journal of World History* 12/1 (2001) 29–98, for the influence of climatic phenomena of shorter duration during the late medieval period, and in general BEHRINGER, Kulturgeschichte des Klimas.

¹⁰⁸ For the ecological vulnerability of many areas of the Mediterranean cf. P. HORDEN – N. PURCELL, The Corrupting Sea. A Study of Mediterranean History. Malden – Oxford 2000, 51–122. In the 10th century, also short-term weather extremes contributed to the process of increasing large-scale landed property at the cost of the small and medium-sized farmers, cf. HALDON, Social Elites, Wealth and Power 187.

¹⁰⁹ KODER, "Zeitenwenden" 421–422.

Mediterranean societies were in the way of northern warrior aristocracies with slender means and big appetites", as Paul Magdalino has formulated it.¹¹⁰

Therefore, models of isolated demographic-structural dynamics such as the one of Turchin seem inadequate as major explanatory machine especially for the Byzantine case, but also for other historical societies. John Watts for instance states in his recent survey of Late Medieval Europe: "meanwhile, it has become clear from more detailed research that neither economic hardship nor economic wellbeing take us very far in explaining political revolts of the period, whether popular or aristocratic"¹¹¹; the demography – instability model of Turchin seems therefore at little bit out-dated in relation to recent developments in historical studies.

Thus, it may be more profitable to look at some other properties of the model than to attempt to fit its trajectory to one constructed on the basis of historical data and estimates of uncertain reliability; as Bonneuil wrote: "the theory of dynamic systems can bring much more to history than the application of equations yielding cycles."¹¹² We can learn from a complex system based on relatively simple mechanisms such as the one we have inspected that even small changes in (environmental, demographic or socio-economic) parameters can have an unexpected, sometimes even dramatic effect on a population and a society.¹¹³ Yet, as mentioned above, even in its chaotic state, a complex system "*is always bounded*", and although its exact trajectory cannot be predicted, the "range" of its behaviour and its reactions to change (and "crisis") can be observed. One characteristic of Turchin's model is its resilience; as long as its basic mechanisms are intact, the trajectories for N and S will rise again even after the most severe disturbances; then, the system will adapt also if we drastically reduce its environment (the carrying capacity, k ; see **fig. 13** and **14**); but if one of the essential mechanism is destroyed (the persistence of ρ even if $S = 0$), the system collapses (see **fig. 12**). At the same time, that Turchin's model cannot capture the complexity of historical dynamics in an appropriate way is finally illustrated if we compare the visualisation of the attractor

¹¹⁰ MAGDALINO, *The Empire of the Komnenoi* 648. Cf. also R. BARTLETT, *Die Geburt Europas aus dem Geist der Gewalt. Kolonisierung und kultureller Wandel von 950 bis 1350*. Munich 1996, on the „Western Expansion“ in these centuries.

¹¹¹ WATTS, *The Making of Polities* 17. A case against the universal validity of Turchin's model would also be medieval Japan, which did not undergo a phase of demographic contraction in the 14th century (population growth continued), yet also experienced a period of high political instability, cf. LIEBERMAN, *Strange Parallels* 380, 407–411, 425, and W. W. FARRIS, *Japan's Medieval Population. Famine, Fertility, and Warfare in a Transformative Age*. Honolulu 2006, 94–163.

¹¹² BONNEUIL, *Review* 269.

¹¹³ Cf. also HATCHER – BAILEY, *Modelling the Middle Ages* 213–215.

for internal instability in Turchin's model (see **fig. 15**) and in the randomized model (**fig. 16**) with the attractors for the instability indices for England between 1130 and 1750 CE (used by Turchin, **fig. 17**) and for Byzantium between 280 and 1400 CE (constructed by us, **fig. 18**); while Turchin's attractor (also in the randomized version) is typical for the cyclic process proposed by him, the attractors for England and Byzantium indicate a complex, "chaotic" process underlying the historical dynamics of crisis in these polities.¹¹⁴

3. Social Networks and resilience in (Late) Byzantium

Demography and climate certainly influenced the dynamics of crises in a pre-modern society such as Byzantium to a relatively high degree; the complex interactions between these factors constituted (then and now) a challenge for a state and a "traditional" society. Yet, as already mentioned with regard to the Malthusian model, the actual effects of these factors were also determined by the reaction of state and society, from the level of the imperial government to each individual peasant and his family. The interactions and connections between these individuals, groups and institutions again can be understood as elements of complex systems – and they produce complex patterns similar to those we have observed for the "macro-models".

An already well-established method for the recording, analysis and visualisation of such connections is network analysis.¹¹⁵ It has been used in historical studies for decades, also by scholars of the Western Middle Ages¹¹⁶, much less so by Byzantinists – with the

¹¹⁴ For various examples of different attractors and processes by Turchin himself see also his study: P. TURCHIN, *Complex Population Dynamics: A Theoretical/Empirical Synthesis*. Princeton – Oxford 2003, 141–154, and *passim*.

¹¹⁵ For an overview cf. A.-L. BARABASI, *Linked. The New Science of Networks*. Cambridge 2002. The now „classic“ handbook on network analysis is St. WASSERMANN – K. FAUST, *Social Network Analysis: Methods and Applications (Structural Analysis in the Social Sciences)*. Cambridge 1994; recent comprehensive works are: J. SCOTT, *Social Network Analysis. A Handbook*. Los Angeles – London ²2000; D. JANSEN, *Einführung in die Netzwerkanalyse. Grundlagen, Methoden, Forschungsbeispiele*. Wiesbaden ³2006; F. VEGA-REDONDO, *Complex Social Networks (Econometric Society Monographs)*. Cambridge 2007, and M. O. JACKSON, *Social and Economic Networks*. Princeton 2008; D. EASLY – J. KLEINBERG, *Networks, Crowds, and Markets. Reasoning about a Highly Connected World*. Cambridge 2010.

¹¹⁶ Cf. P. BEARMAN, *Relations into Rhetorics: Local Elite Social Structure in Norfolk, England: 1540–1640*. Piscataway, New Jersey 1993; D. R. WHITE – U. C. JOHANSEN, *Network Analysis and Ethnographic Problems. Process Models of a Turkish Nomad Clan*. Oxford 2005; Qu. VAN DOOSSELAERE, *Commercial Agreements and Social Dynamics in Medieval Genoa*. Cambridge 2009; in general cf. R. V. GOULD, *Uses of Network Tools in Comparative Historical Research*, in: J. MAHONEY – D. RUESCHEMEYER (eds.), *Comparative Historical Analysis in the Social Sciences*. Cambridge 2003, 241–269. A "classic" study is J. F. PADGETT – Ch. K. ANSELL, *Robust Action and the Rise of the Medici, 1400–1434*. *The American Journal of Sociology* 98/6 (1993) 1259–1319. An implementation of the newest methods for the analysis of medieval networks is: R. BOULET – B. JOUVE – F. ROSSI – N. VILLA, *Batch kernel SOM and related Laplacian Methods for Social Network Analysis*. *Neurocomputing* 71/7–9 (2008) 1257–1273. On the contrary examples for studies which abstain from the

exception of Margaret Mullett's book on Theophylact of Ochrid, Giovanni Ruffini's recent study on 6th century Egypt and some studies on historical geography.¹¹⁷ What may make this method more acceptable for the sceptic historian than the macro-models is the fact that it allows him or her directly to construct the nodes and ties of a network on the basis of the sources and then to analyse the outcome; one has no need to attempt to find evidence for the explanatory value of a certain model which has been constructed in advance.

As a simple example we re-constructed the network of the Byzantine village priest Basileios Aroules from Radolibos in Macedonia (see fig. 19) on the basis of a register of dues for the Athos monastery of Iviron from the year 1316; there the following entrance can be found: *"The priest Basileios Aroules, has (a woman) Helene, a son, the priest Konstantinos, from him a daughter-in-law Anna, another son Chalkos, a daughter Maria, from her a son-in-law Ioannes, one house, one ox, a vineyard of nine modioi; the total tax amount is two hyperpyra [the Byzantine goldcoin at that time]. Ioannes, the shoemaker, his son, has (a woman) Zoë, the sons Daniel und Basileios, a house, a vineyard of three modioi; the total tax amount is one hyperpyron. Michael, the shoemaker, his other son, has (a woman) Eirene, a daughter Anna, a house, a vineyard of three modioi; the total tax amount is one hyperpyron."*¹¹⁸ One can recognize the variety of ties which we find in this (and other) document(s) and which connected Basileios Aroules with the members of his family as well as with the members of his parish and the village, but also with the local bishop (as his superior), the representatives of the monastery of Iviron (as the lord of the manor) and the local officials of the state (who composed the register of dues)¹¹⁹; through the medium of these actors Basileios Aroules could – hypothetically – even get linked with the highest authorities of the Patriarch and the Emperor in Constantinople

use of mathematical methods in the field of network analysis are most of the papers in: I. MALKIN – CHR. CONSTANTAKOPOULOU – K. PANAGOPOULOU (eds.), *Greek and Roman Networks in the Mediterranean*. Abingdon 2009.

¹¹⁷ M. MULLETT, *Theophylact of Ochrid. Reading the Letters of a Byzantine Archbishop (Birmingham Byzantine and Ottoman Monographs 2)*. Aldershot 1997, esp. 163–222; see also her observations in IDEM., *Byzantium: A Friendly Society? Past & Present* 118 (1988) 3–24; G. R. RUFFINI, *Social Networks in Byzantine Egypt*. Cambridge 2008; F. R. PITTS, *The Medieval River Trade Network of Russia Revisited*. *Social Networks* 1(1978/79) 285–292; M. WAGSTAFF, *Network Analysis and Logistics: applied Topology*, in: J. HALDON (ed.), *General Issues in the Study of Medieval Logistics. Sources, Problems and Methodologies*. Leiden – Boston 2006, 69–92.

¹¹⁸ *Actes d'Iviron III. Texte*, ed. J. LEFORT et. al. (*Archives de l'Athos* 18). Paris 1994, 74, lns. 69–71 (original text in Greek).

¹¹⁹ This and other networks in this proposal were created with the software packages *Pajek*, cf. W. DE NOOY – A. MRVAR – V. BATAGELJ, *Exploratory Social Network Analysis with Pajek (Structural Analysis in the Social Sciences)*. Cambridge 2005, and *ORA*, cf. <http://www.casos.cs.cmu.edu/projects/ora/>.

(see **fig. 19**); the famous dictum of "only six degrees" which separate an individual from any other¹²⁰ is also valid for Byzantium.

In historical study, network analysis until now mainly has been used to evaluate the position of individuals within the network, their relevance and influence on the basis of the number of their links ("degree") or the number of other nodes for which they could function as a bridge ("betweenness").¹²¹ But the combination of individual components into larger scale networks results in the emergence of new patterns and characteristics. Therefore, networks are to be analysed at the level of individual actors or smaller groups, but also at the level of the total network.¹²²

The relevance of the network approach for the analysis of Late Byzantium has again already been acknowledged by Angeliki Laiou; she wrote: "Part of the dynamic characterizing the relationship between the numerous actors in the political scene during the Palaiologan period is the effort not so much to centralize but rather to form networks that would provide for their members a modicum of security and more power than each one alone could command."¹²³ In order to be able to analyse one of these network, we re-constructed on the basis of the Prosopography of the Palaiologan Era the network of the "*dynatoi*", the powerful noblemen and state functionaries, for the period between 1310 and 1341, with 187 nodes and 609 ties (of family connections, allegiance and alliance; see **fig. 20**).¹²⁴ Douglass C. North, John Joseph Wallis and Barry R. Weingast in their book on "Violence and Social Orders" recently pointed out the relevance of such a "dominant coalition" for the organisation and distribution of power within pre-modern, "natural" states:

¹²⁰ WASSERMANN – FAUST, *Social Network Analysis* 53–54; EASLEY – KLEINBERG, *Networks, Crowds, and Markets* 537–538; D. J. WATTS, *Small Worlds. The Dynamics of Networks between Order and Randomness* (*Princeton Studies in Complexity*). Princeton – Oxford 1999, 11–40.

¹²¹ On these parameter cf. WASSERMANN – FAUST, *Social Network Analysis* 100–107, 189–191; SCOTT, *Social Network Analysis* 67–68, 83–89; JACKSON, *Social and economic Networks* 38–39, 59–65.

¹²² Cf. the literature on network analysis cited above and R. ALBERT – A.-L. BARABÁSI, *Statistical Mechanics of Complex Networks. Reviews of Modern Physics* 74 (2002) 48–97.

¹²³ LAIOU, *Byzantium and the Neighboring Powers* 49. For the relevance of network cf. also MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 4–9; HALDON, *Social Élites, Wealth and Power* 171–172 and 180, and WATTS, *The Making of Polities* 153–157.

¹²⁴ E. TRAPP et al. (eds.), *Prosopographisches Lexikon der Palaiologenzeit*. CD-ROM-version, Vienna 2001. On the political and social history of this period cf. A. E. LAIOU, *The Palaiologoi and the World around them (1261–1400)*, in: SHEPARD (ed.), *The Cambridge History of the Byzantine Empire 803–833*; NICOL, *The Last Centuries* 152–184; G. WEISS, *Joannes Kantakuzenos – Aristokrat, Staatsmann, Kaiser und Mönch – in der Gesellschaftsentwicklung von Byzanz im 14. Jahrhundert*. Wiesbaden 1969; K. P. KYRRES, *Το Βυζάντιον κατὰ τὸν ΙΔ' αἰῶνα. Ἡ πρώτη φάσις τοῦ ἐμφυλίου πολέμου καὶ ἡ πρώτη συνδιαλλαγή τῶν δύο Ἀνδρονίκων (1321)*. Leukosia 1982; D. S. KYRITSES, *The Byzantine Aristocracy in the Thirteenth and Early Fourteenth Centuries*. Dissertation, Cambridge, Mass. 1997; MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz*.

"A natural state manages the problem of violence by forming a dominant coalition that limits access to valuable resources – land, labour, and capital – or access to and control of valuable activities – such as trade, worship, and education – to elite groups. (...) Focusing on the dynamic relationships of the players in the dominant coalition allows us to explicate and understand the logic of the social order and the conditions underlying all social organizations in a natural state. (...) The dynamics of natural states are the dynamics of the dominant coalition, frequently renegotiating and shifting in response to changing conditions."¹²⁵

One of the most striking characteristics of this network is of course that we recognise two centres of gravity; these are the two emperors who were competing for power in the 1320s, Andronikos II Palaiologos and his grandson Andronikos III Palaiologos. We also can identify various clusters which represent the most important noble families whose members all possessed important positions in the state; the largest cluster is that of the imperial clan of the Palaiologoi itself.¹²⁶

In order to evaluate the network in its totality, we constructed a random network with the same basic parameters as a benchmark so that we could identify some special features. We compared the two networks with regard to the "three robust measures of network topology" (see **fig. 21**)¹²⁷: average path length (or average distance between two nodes; the path length between two directly connected actors is 1), the clustering coefficient (a measure of the likelihood that two associates of a node are associates themselves. A higher clustering coefficient indicates a greater "cliquishness") and the average degree (the average number of nodes with which an actor is directly connected). Although we used the same average degree for the random network, the differences between the two networks with regard to path length and especially clustering coefficient are significant. This indicates that the distances between the nodes in the network of Byzantine *dynatoi* were smaller than what could be expected for a network of this size (the "small world" phenomenon which has also been observed for many real world modern networks¹²⁸), at the same time, the "cliquishness" among the Byzantine aristocracy at this time is high, a characteristic which supports a more decentralized flow of power and influence within the network. Yet of course influence and power were not equally distributed among the *dynatoi*; this becomes evident if we compare the distribution of degree (the number of nodes every node is connected with)

¹²⁵ D. C. NORTH – J. J. WALLIS – B. R. WEINGAST, *Violence and Social Orders. A Conceptual Framework for Interpreting Recorded Human History*. Cambridge 2009, 30–31, 73.

¹²⁶ On the identification of clusters and cliques cf. also SCOTT, *Social Network Analysis* 100–122.

¹²⁷ As Réka Albert and Albert-László Barabási have called them, cf. ALBERT – BARABÁSI, *Statistical Mechanics of Complex Networks*; cf. also JACKSON, *Social and Economic Networks* 56–65.

¹²⁸ Cf. WATTS, *Small Worlds*; ALBERT – BARABÁSI, *Statistical Mechanics of Complex Networks*.

of the *dynatoi*-network with the random network (see **fig. 22** and **23**). While in the latter case the degree is very equally distributed around its average value, the degree-distribution for the *dynatoi*-network is much more unequal. Again, this is a phenomenon now well-known from many studies on modern day larger scale networks; it has been connected with a preferential attachment process, which means that emerging ties between nodes are distributed among individuals according to how much they already have, so that those who already have receive more than those who have not.¹²⁹ This would also be very much the case within a stratified elite such as we observe in later Byzantium; also a cumulative distribution of the “points of nobility” determined by Kazhdan and Ronchey for the aristocratic families in the 11th and 12th century which we calculated suggests a similar dynamic process for the unequal distribution of power and influence within the elite (see **fig. 24**).¹³⁰

The results of network analysis converge with the internal situation in Byzantium (civil war, intra-aristocratic competition) at this time (see above); also Angeliki Laiou has stated with regard to the networks of the powerful in the Palaiologan period: “All these alliances eventually created complex and murky situations as competing and conflicting political groupings formed around them.”¹³¹ The delicate balance within the aristocratic network becomes evident if we execute a simple test on how the network model reacts to turbulences: we remove the two most central nodes; these are of course the old Emperor Andronikos II Palaiologos (who was displaced in 1328) and his grandson Andronikos III Palaiologos (who died in 1341). The visualisation (see **fig. 25** and **26**) alone tellingly illustrates the effect on the network: fragmentation; cliques and factions within the aristocracy become visible, loyalties disintegrate.¹³² This is even more documented by the development of central network analytical measurements (see **fig. 27 a** and **b**): fragmentation (the proportion of nodes that are disconnected) increases, connectedness, global efficiency (as measure for the possible efficient distribution of resources and information within the network) and network centralisation decrease

¹²⁹ ALBERT – BARABÁSI, *Statistical Mechanics of Complex Networks*; JACKSON, *Social and Economic Networks* 130–134; EASLEY – KLEINBERG, *Networks, Crowds, and Markets* 479–486.

¹³⁰ KAZHDAN – RONCHEY, *L’aristocrazia bizantina* 239–246. For similar observations with regard to the wealth distribution within the medieval Hungarian aristocracy see G. HEGYI – Z. NÉDA – M. A. SANTOS, *Wealth distribution and Pareto’s law in the Hungarian medieval society*. http://arxiv.org/PS_cache/physics/pdf/0509/0509045v1.pdf.

¹³¹ LAIOU, *Byzantium and the Neighboring Powers* 49–50.

¹³² For such a test cf. EASLEY – KLEINBERG, *Networks, Crowds, and Markets* 2 (fig. 1.1) and 8 (fig. 1.2). On the “multi-factional character” of the Byzantine aristocracy see also HALDON, *Social Élites, Wealth and Power* 189.

dramatically. The resilience of a power system based on such network structures in the face of crisis, the ability of its actors to react in common against severe threats is clearly doubtful. And also North, Wallis and Weingast wrote:

"Patron-client networks not only structure the creation, gathering, and distribution of rents that can limit violence; the networks also structure and organize violence itself. When violence breaks out, it is typically among networks of elite factions. (...) Relative prices, demographics, economic growth, technology, and a host of other variables alter continuously in ways that affect the power and position of various elites. As these changes advantage and disadvantage members of the coalition, their relative bargaining positions change. Adjustments in the distribution of privileges and rents must therefore take place to reflect the new balance of power. (...) The actual structure of dominant coalitions in natural states is inherently unstable. The dominant coalition regularly changes size and composition by weeding out weaker members and by incorporating new strong members and, rearranging the entire composition of the coalition. (...) When (...) dramatic adjustments are required, natural states often suffer partial or complete breakdowns in the dominant coalition, and civil war, rather than legal adjustments, can be the result."¹³³

In comparison, we also modelled a network of the institution which during the Late Byzantine Period was relatively the most successful with regard to the preservation of core elements of its institutional framework, its material property and its influence: the Church. We used the relational data for the highest hierarchs (the bishops, the archbishops and metropolitans and the Ecumenical Patriarch) from an earlier study we have completed¹³⁴ and thus modelled the hierarchic network of the church with the Patriarch and the Synod of the metropolitans in the centre (with 697 nodes and 1470 ties; see **fig. 28**). Then we executed the same simple test as for the *dynatoi*-network: we removed the most central node, in this case the Ecumenical Patriarch of Constantinople. The visualisation of the network of the hierarchs (see **fig. 29**) shows in contrast to the *dynatoi* no "visible" effect of similar kind. An inspection of the network measures (see **fig. 30 a and b**) indicates of course a decline with regard to network centralisation or average degree, yet, the network shows no signs of fragmentation and disintegration as the aristocratic network model did. The dense network of the hierarchs participating in the *Synodos endemusa* more or less takes over the position of the Patriarch within the ecclesiastical network. Actually, during the Palaiologan period there were several vacancies when the synod administered the church in the absence of a Patriarch – and

¹³³ NORTH – WALLIS – WEINGAST, Violence and Social Orders 35–36, 40, 51.

¹³⁴ J. PREISER-KAPPELLER, Der Episkopat im späten Byzanz. Ein Verzeichnis der Metropolen und Bischöfe des Patriarchats von Konstantinopel in der Zeit von 1204 bis 1453. Saarbrücken 2008.

the year 1453 the Byzantine Church survived with the synod, but without a Patriarch.¹³⁵ Also North, Wallis and Weingast indicate the different character of such "perpetually lived organization (...) where the identity of the organization is independent from the identity of its individual members" in comparison to the highly personalised, more instable networks of the "dominant coalition".¹³⁶

The different trajectories state and church took in the Late Byzantine period becomes also clear if we compare the territorial development of the Byzantine Empire between 1150 and 1400 (which shows an almost exponential decline, see **fig. 31**) with the ability of the church to maintain core elements of its institutional framework during these centuries. A comparison of the number of episcopal sees listed in the last Notitia (Not. 13 in the edition of Jean Darrouzès) which recorded all suffragan bishoprics, from the middle of the 12th century, with a Notitia from the second half of the 15th century of course shows, how many of its bishoprics the Patriarchate lost during these centuries, mainly because of Western expansion in Greece after 1204 (when the new Latin lords established Catholic bishops in their spheres of control and often ejected the Orthodox ones) and of Turkish conquests in the 14th and 15th centuries (when Muslim potentates took possession of church property and did not allow the residence of a Christian hierarch in their realms)¹³⁷ (see **fig. 32**); yet, a closer analysis demonstrates that the institutional framework remained significantly more intact at the higher hierarchical level (see **fig. 33 a** and **b**). One could say that the ecclesiastical network lost many of its nodes at the periphery, but was able to maintain core elements – and therefore, the network remained functional.

Network analytical tools enable us to re-construct structural models of relations of power and authority directly on the basis of our sources and to test the power of resistance of these models to significant disturbances as they occurred frequently during the Late Byzantine centuries; they thus give clues to the underlying dynamics of central

¹³⁵ For an overview cf. J. PREISER-KAPPELLER, Die hauptstädtische Synode von Konstantinopel (Synodos endemusa). Zur Geschichte und Funktion einer zentralen Institution der (spät)byzantinischen Kirche. *Historicum. Zeitschrift für Geschichte* 96 (Linz 2008) 20–31 (http://www.oeaw.ac.at/byzanz/repository/Preiser_Synodosendemusa_Hist96.pdf). On a more detailed network-analysis of the Synod as such cf. example J. PREISER-KAPPELLER, Calculating the Synod? A network analysis of the synod and the episcopacy in the Register of the Patriarchate of Constantinople in the years 1379–1390, to be published in: Ch. GASTGEBER et. al. (eds.), Das Patriarchatsregister von Konstantinopel. Eine zentrale Quelle zur Geschichte und Kirche im späten Byzanz (*Veröffentlichungen zur Byzanzforschung*). Vienna 2011 (draft online: http://www.oeaw.ac.at/byzanz/repository/Preiser_WorkingPapers_Calculating_II.pdf).

¹³⁶ NORTH – WALLIS – WEINGAST, Violence and Social Orders 46.

¹³⁷ For an overview cf. PREISER-KAPPELLER, Der Episkopat im späten Byzanz L–LVI.

elements of the Byzantine framework in the face of crisis and to the possibilities and limitations these structures provided for acting groups and individuals.

4. Byzantium and the "Late Medieval Crisis" in context

We now have inspected late medieval macro-dynamics of demography and climate and structural properties of Late Byzantium with regard to networks of power within the framework of complexity. Not of less relevance is of course the actual decision-making and reaction of individuals, groups and institutions in Byzantium in the face of crisis. As with regard to macro-models, it is necessary not to treat Byzantium as an isolated case but in comparison with other contemporary societies which faced a similar "bundle of crises phenomena" in the 14th and 15th century.¹³⁸

As Angeliki Laiou has pointed out, "in important ways (...) the government in the Byzantine empire was undergoing a transformation quite different from that of parts at least of western Europe", whose rulers constantly challenged each other's power ("How war made states, and vice versa", as Charley Tilly has formulated it). There we can observe a "growth of government", the establishment of stronger centralised states and administrations with the development of general taxation, the establishment of a permanent tax administration and rising state incomes (in England, France, Castile, Venice, Genoa, Florence and the Papacy between 1340 and 1370), instruments which the Byzantine state had possessed since Late Antiquity, but which were weakened at the same moment as Western European polities began to implement them.¹³⁹ This is also illustrated in the development of imperial legislation; as Dimitar Angelov states:

¹³⁸ Cf. also John Haldon's questions in his article "Towards a Social History of Byzantium", in: IDEM (ed.), *The Social History of Byzantium* 23: "Where does Byzantine society and economy, and the Byzantine state and political system, fit into the broader picture of European and Near Eastern social, economic and political structures? What features are found in common with which other neighboring systems, and what features distinguish it from them?" Cf. also IDEM, *The Byzantine Empire* 206–208.

¹³⁹ LAIOU, *The Palaiologoi and the World around them* 812–813. Cf. Ch. TILLY, *Coercion, Capital, and European States, AD 990–1992*. Cambridge – Oxford 1992, 67–95; W. REINHARD, *Geschichte der Staatsgewalt. Eine vergleichende Verfassungsgeschichte Europas von den Anfängen bis zur Gegenwart*. Munich ²2000, 52–80; MEUTHEN, *Das 15. Jahrhundert* 28–40; NORTH, *Europa expandiert* 371–375, and WATTS, *The Making of Polities* 19–34, 166–169, 180–188, 205–254, 376–419, for a summary of these developments and also for some critical review of Tilly's approach; Watts states: "The polities that emerged from the fourteenth and fifteenth centuries had stronger centres, more complex administrations and clearer boundaries, but they had all these things because of pressure from below as well as design from above, and because of processes of conflict as well as the exercise of authority." (p. 425). Cf. also G. HARRISS, *Shaping the Nation. England 1360 – 1461* (The New Oxford History of England). Oxford 2005, 58: "During the half-century from 1290 to 1340 the fiscal basis of the English state shifted from dominal to tax revenues." A contrary trend we observe in 13th and 14th century Byzantium, where the relevance of revenues from imperial land property increased in relation to taxation, cf. MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 50; ANGELOV, *Imperial Ideology and Political Thought* 271–272.

"Instead of general laws, the Byzantine emperors after 1204 preferred to issue privileges addressing a specific individual, city, monastery, bishopric, foreign dignitary, or urban community".¹⁴⁰ Because of this partly reverse process to the "state building" in Western Europe (described in the study of Avner Greif for Genoa for instance), the Byzantine polity, who had possessed "a ruler with a (relative) monopoly" in earlier centuries, now faced the "challenge (...) to motivate" (what Greif labels) various "social structures (clans, aristocracies, communities, etc.) to mobilize their economic and military resources to accomplish the tasks the state must undertake to foster political stability and economic prosperity".¹⁴¹ Especially in this respect, Byzantium's central power was less and less successful.

4.1 Collective action and reaction to crisis

As we have seen in the comparison of post-Plague England and Egypt, the reaction of the landowning elite could very much influence the outcome of crisis; at the same time, these examples indicate that the Byzantine nobility was not special in its effort to guarantee the resources for their status even at long-term cost for the entire polity and society; John Watts states:

"(...) fourteenth-century political settlements were mostly rather shaky. For one thing, they were brokered between powers whose rights and interests frequently clashed, sometimes fundamentally. For another, they depended as much on informal compromises as on formal ones, and this usually meant a further dependence on the personal skills of rulers or on the maintenance of interpersonal relations; these were bound to come under strain, and to face frequent interruption and revision as leading participants failed or died. Even when all the powers in a given area succeeded in working out durable patterns of association, these were vulnerable to the sheer difficulty of ruling fourteenth-century states, with their broad social range, their protean administrative structures, their unfixed borders and their vulnerability to events." ¹⁴²

Such a case we can observe in 14th century Sicily, where the "roots of crisis" had been interestingly influenced by Byzantium's foreign policy, since in 1282 the financial support of Michael VIII Palaiologos had enabled the Aragonese to wrest away the island

¹⁴⁰ ANGELOV, *Imperial Ideology and Political Thought* 5. On the decay of secular jurisdiction in the 14th century cf. MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 39–40, and O. KRESTEN, *Ein Indizienprozeß gegen die von Kaiser Andronikos III. Palaiologos eingesetzten katholikai kritai*. *Fontes Minores* IX (1993) 299–337.

¹⁴¹ GREIF, *Institutions and the Path to the Modern Economy* 217–219.

¹⁴² WATTS, *The Making of Politics* 285, and 196–201 (for similar development in the monarchies of East Central Europe).

from the Empire's most dangerous enemy, Charles I of Anjou¹⁴³; in the following years, "the Aragones found it necessary, in order to stabilize their new regime and defend it against Angevin attack, to re-establish a strong feudal military class."¹⁴⁴ Since the 1330s, this strong aristocracy was confronted with declining "feudal revenues" because of the economic crisis in the countryside we can also observe in other regions and which was later intensified by the Black Death. Stephan R. Epstein describes the development during these decades:

"The aristocracy could respond to these conditions with a variety of strategies. One was to redistribute land and revenue within the aristocracy itself through warfare. Another was an increase of rights of jurisdiction, the significance of which always tended to increase in periods of declining rents. A third strategy was to expand customary sources of income to include revenue from the state. Finally, an aristocrat could become an entrepreneur, although in the long run this was the hardest option of all, for above all, business acumen and capital, rather than military and political coercion, were needed to compete successfully in the market. During the fourteenth century, the Sicilian aristocracy seems to have reacted to economic hardship mainly by adopting the first three, defensive strategies – in other words, by trying to redistribute power and existing resources to itself, rather than by exploiting new economic opportunities. From the 1330s until the early 1360s, the greater Sicilian magnate families waged civil war (...). The existence by the 1360s of three or four feudal "states", loosely organized around the figure of a count, was thus the outcome of decades of selection through military confrontation."¹⁴⁵

In the longer term, the outcome of intra-aristocratic struggles for resources and power was similar to the one in Byzantium (where we also observe comparable options for the aristocracy): a relative decline of the old aristocratic elite and the (re-)integration in a larger, more centralised political formation from abroad (the Aragones "restoration" in the years 1392–1398).¹⁴⁶ As in the case of Byzantium, external forces took the benefit from the aristocracy's reaction to crisis; and different reactions to the "external circumstances" again as in the case of changing demographic and economic conditions very much influenced the outcome of crisis. As the summary of the development after the middle of the 14th century indicated, the "lack of unity and social cohesion" within Byzantium's society¹⁴⁷ weakened its ability to find a common solution to the empire's challenges, especially Ottoman expansion.

¹⁴³ Cf. St. RUNCIMAN, *The Sicilian Vespers. A history of the Mediterranean world in the later Thirteenth Century*. Cambridge 1958.

¹⁴⁴ EPSTEIN, *An island for itself* 317, 322.

¹⁴⁵ EPSTEIN, *An island for itself* 317–319.

¹⁴⁶ EPSTEIN, *An island for itself* 320–347; S. FODALE, Art. Sizilien. *Lexikon des Mittelalters* VIII, 1960–1964.

¹⁴⁷ On aristocratic assaults on private property of merchants for instance already in the early Palaiologan period cf. MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 113–114.

That the Byzantine polity faced a "collective action dilemma" (in the form described above by Avner Greif)¹⁴⁸ is illuminated by an episode from 15th century Morea, where in contrast to other parts of the fragmented state still a larger coherent territory was under the formal rule of the Despot residing in Mistra; at the same time, this meant that "traditional" landowning magnates were still the dominant force in the area's socio-economic framework. As Nevra Necipoğlu has pointed out, "one of the major aspirations of the landowning aristocracy was to acquire freedom from certain obligations to the government at Mistra" (military service, tax payments); therefore they preferred a weak central regime.¹⁴⁹ How this attitude constricted defence efforts against the Ottomans became evident in 1415, as the Despot Theodore II Palaiologos (1407–1443) together with his father Emperor Manuel II attempted to restore the Hexamilion wall across the Isthmus of Corinth, which protected the peninsular against (Ottoman) attacks from mainland Greece. As these measurements would have implicated the raising of extra taxes for the rebuilding and maintenance of the fortifications and additional defence duties for the military aristocrats, some of the magnates heavily opposed the Despot's politics, since they feared, as we read in a Letter of Manuel II from the year 1416, that it would strengthen and stabilize the central government's control over themselves and had the potential of turning into an instrument of internal control: "For this was a veritable noose around their necks, inasmuch as it completely prevented them from continuing to perpetrate their former outrages and from manifesting their loyalty to the despot, not by deeds, but by the mere claim to be well disposed toward him. It forced them into the position of having to confirm by their actions that they were in fact, what they only professed to be. The wall, of course, would tilt the scale in favour of the despot and enable him to compel them to act according to their profession. Understandably, they were not very fond of their chastener".¹⁵⁰ This example is also of high explanatory value, since we possess an "analysis" of the internal weaknesses of the Morean polity by the central governing institution of one of the most successful states of the Late Medieval Mediterranean: Venice. In 1422/1423, Despot Theodore II opened negotiation

¹⁴⁸ Cf. also BUCHANAN, *The Social Atom* 131–136 on the "physics of social cohesion", and N. WILKINSON, *An Introduction to Behavioral Economics*. Houndsmill 2008, 376–377, on further aspects of these phenomena. Peter Turchin also attempted to formulate mathematical model for the development of "collective solidarity" in a premodern society, cf. TURCHIN, *Historical Dynamics* 29–93 And 206–208; we intend to analyse this model in a future paper.

¹⁴⁹ NECIPOĞLU, *Byzantium between the Ottomans and the Latins* 235–258.

¹⁵⁰ *The Letters of Manuel II Palaeologus*. Text, translation and notes by G. T. DENNIS (*CFHB* 8). Washington, D. C. 1977, no. 68, 208–215, esp. 213, 148–215, 154; NECIPOĞLU, *Byzantium between the Ottomans and the Latins* 259–267.

with the Serenissima about the transfer of the maintenance and defence of the Isthmian fortifications to the Venetians. The issue was discussed by the Venetian senate in February 1423; it was decided to accept Theodore's proposal under two conditions: first, everyone and particularly the big landowners would have to contribute to the defence, each according to his mean; to determine the proper amount of contribution from each household, an assessment of the resources should be executed; second, internal peace between the Despot and the magnates should be kept, and disputed matters should be submitted to the Senate.¹⁵¹ Not only Venetian observers identified the "collective action dilemma" of the Despotate; also proposals for social and economic reforms of the Morea by the Byzantine philosopher Georgios Gemistos Plethon (1355/1360–1452) and his disciple Bessarion (1403–1472) contain similar elements as the demands of Venice (the establishment of a just taxation of all subjects, the strengthening of central control over common defence efforts).¹⁵² But instead the following decades saw a growing weakness of central authority in the Morea (various aristocratic clans also sought individual arrangements with the Venetians or even the Ottomans) and invasions and finally conquest by the Ottomans (in 1460).¹⁵³ Yet, from their individual point of view, the aristocrats of the Morea acted "rational" in their own (albeit maybe only short-term) interest; Avner Greif wrote: "The resulting coordinating state, in which each social structure can decide whether to mobilize its resources for the state is weak. Its ability to act is limited, because a social structure will contribute only to tasks that do not alter the capacity of others to use their coercive power ex post to expropriate the resulting gains or gain additional powers and resources, thereby leaving the relevant social structure or its leaders worse off."¹⁵⁴ This development also accords well with the complexity-based analysis of Angeliki Laiou: "At that point also the rivalry for fragments of power and resources becomes so ubiquitous that it negates the possibility of acting in a larger common interest – in putting up a common defense for

¹⁵¹ C. N. SATHAS, Documents inédits relatifs à l'histoire de la Grèce au Moyen Âge. Vol. I, Paris – Venice 1880, nr. 78 (115–119) and nr. 83 (126–127); F. THIRIET, Régestes des délibérations du Sénat de Venise concernant la Romanie. Vol. II. Paris – The Hague 1958, nr. 1849 and 1870; NECIPOĞLU, Byzantium between the Ottomans and the Latins 268–269. For the installation of an external institution as arbiter as solution to the collective action dilemma cf. also GREIF, Institutions and the Path to the Modern Economy 237–238.

¹⁵² C. M. WOODHOUSE, Gemistos Plethon. The Last of the Hellens. Oxford 1986, 79–118; Ch. P. BALOGLOU, Georgios Gemistos-Plethon. Ökonomisches Denken in der spätbyzantinischen Geisteswelt (*Historical Monographs* 19). Athens 1998, esp. 56–87. On Bessarion's concepts cf. S. RONCHEY, Orthodoxy on Sale: The Last Byzantine, and the lost Crusade, in: E. JEFFREYS (ed.), Proceedings of the 21st International Congress of Byzantine Studies, London 21–26 August 2006. Vol. I: Plenary Papers. Aldershot 2006, 313–342.

¹⁵³ NECIPOĞLU, Byzantium between the Ottomans and the Latins 259–284.

¹⁵⁴ GREIF, Institutions and the Path to the Modern Economy 219.

example. It is then that the need for political reconcentration becomes overwhelming.”
¹⁵⁵ The fate of Byzantium was that this “political reconcentration” was accomplished by an external force – the Ottomans – while other polities in Europe, even when under severe external stress as France during the Hundred Years’ War, got the opportunity to develop internally solutions for their problems, to establish a more successful “coordinating state” and to maintain their integrity – crisis brought transformation, not collapse.

4.2 Social mood and Black Swans in Byzantium

Recent research from the field of complexity studies indicates that the dynamic interactions within the networks of a society result in the emergence of attitudes, beliefs and strategies, which often spread across a network in an “epidemic-like” process (“social contagion”) and strongly influence the reaction of individuals and groups to change or crisis; Robert Prechter and John L. Casti in their books on “socioeconomics” suggest that “the social mood of a group or society (...) biases the character and the likelihood of the events (in politics, economics, etc.) that actually occur”.¹⁵⁶ Therefore, one has to take into consideration also the role of networks in the formation of attitudes and reactions (the negative attitude of parts of the population in Western Asia Minor to the new regime of Michael VIII Palaiologos after 1258 even before the beginning of the new wave of Turkish expansion for instance certainly influenced the following events, as is also indicated by the contemporary historian Georgios Pachymeres¹⁵⁷) and their influence on the developments of the time¹⁵⁸; in this respect, the network approach is strongly connected with the research on the decisions and reactions of individuals and groups in the face of crisis.

Beyond models for the collective reaction to crisis phenomena, one has to consider individual decision-making under conditions of complexity and uncertainty. In 1421, Emperor Manuel II (d. 1425) according to the historian Sphrantzes remarked in a debate

¹⁵⁵ LAIOU, *Byzantium and the Neighboring Powers* 52.

¹⁵⁶ DE NOOY et. al., *Exploratory Social Network Analysis with Pajek* 161–181; JACKSON, *Social and Economic Networks* 185–256. R. PRECHTER, *The Wave Principle of human social behavior and the new science of Socioeconomics*. Gainesville, GA 1999, and J. L. CASTI, *Mood Matters. From rising skirt lengths to the collapse of World Powers*. New York 2010. For the formation of attitudes during the 14th century crisis cf. also B. Z. KEDAR, *Merchants in Crisis. Genoese and Venetian Men of Affairs and the Fourteenth-Century Depression*. New Haven – London 1976.

¹⁵⁷ Cf. D. ANGELOV, *Imperial Ideology and Political Thought in Byzantium, 1204–1330*. Cambridge 2007, 269–285.

¹⁵⁸ Cf. A. BARRAT – M. BARTHÉLEMY – A. VESPIGNANI, *Dynamical Processes on Complex Networks*. Cambridge 2010, 216–241.

with his son and successor John VIII about the politics towards the Ottomans: "Today, as troubles accompany us constantly, our empire needs not an emperor (*basileus*) but an administrator (*oikonomos*)."¹⁵⁹ Accordingly, Manuel II (or Sphrantzes) believed that the Byzantine polity could no longer support imperial ambitions as in earlier times, but that decision-making had to be based on a more "business-like" consideration of the state's interests, resources and limits. But not only Byzantium lacked such an *oikonomos* at its top; J. R. Strayer delivers the following judgement on late medieval European rulership: "Even strong and able kings, who surrounded themselves with the best counsellors, had problems to develop rational and continuous guidelines of politics. They were inclined to overestimate their financial and military means and to underestimate the necessity of internal reforms".¹⁶⁰

The complexity framework adds some further aspects to decision-making: under conditions of complexity and non-linearity, every measure (or "input" in the system) could produce unanticipated results and unintended consequences; especially measures which presumably brought short-term benefits could prove detrimental in the long-term.¹⁶¹ Yet, the measures taken may have seemed to be rational at the time of decision-making. For most contemporaries the recapture of Constantinople in 1261 was the greatest success of Byzantium for a long time and symbolised the reestablishment of the legitimate world order within the traditional framework of Eastern Roman political thinking; they would not have supposed that this decision could lead onto a path towards catastrophe. But according to the Byzantine historian George Pachymeres, the *protasekretis* Michael Senacherim upon learning of the re-conquest of Constantinople from the Crusaders by the forces of the exile empire of Nicaea in 1261 cried out: "*Oh, what things I hear! (...) What sins have we committed, that we should live to see such misfortunes? Let no one harbour any hopes, since the Romans (= the Byzantines) hold the City (= Constantinople) again.*"¹⁶² Whether Senacherim possessed the gift of prophecy or Pachymeres himself commented in this way on the trajectory of the Byzantine state he had observed in the decades after 1261, one encounters here the perception that a specific action would set the further development on a certain path which would be hard

¹⁵⁹ Sphrantzes XXII, 7 (ed. MAISANO 82, 21–22); N. NECİPOĞLU, Byzantium between the Ottomans and the Latins. Politics and Society in the Late Empire. Cambridge 2009, 18, 34–35.

¹⁶⁰ J. R. STRAYER, On the Medieval Origins of the Modern State. Princeton 1970; cited after MEUTHEN, Das 15. Jahrhundert 28.

¹⁶¹ Cf. P. PIERSON, Politics in Time. History, Institutions, and Social Analysis. Princeton – Oxford 2004.

¹⁶² George Pachymeres II, 28 (ed. A. FAILLER, Vol. I. Paris 1984, 204–205; original text in Greek).

to leave again despite fatal consequences; the reestablishment of Byzantine power in Constantinople for instance made it necessary to concentrate all resources on the reconstruction and defence of the capital at the cost of the areas in Western Asia Minor, which accordingly fell under Turkish rule and became the power basis for the force which would finally bring the empire to its end, as we have seen.

The complexity framework makes us also aware that some outcomes of social, political and economic change are "strongly self-reinforcing" because of positive feedback-processes; once "a dense network of institutions and interests had developed" around a certain system or institution, it later became often "virtually impossible to switch over" to a more appropriate practice. A "competitive selection of practices" could not take place any more.¹⁶³ Well-established practices even influence the perception of decision-makers, since "actors who operate in a social context of high complexity and opacity are heavily biased in the way they filter information into existing 'mental maps' (...). Confirming information tends to be incorporated, while disconfirming information is filtered out."¹⁶⁴ And on the one hand, polities with a higher degree of systemic integration and complexity may have a competitive advantage in comparison with neighbouring less complex groups, on the other hand "an increasingly complex system will become increasingly 'path-dependent' and lose its adaptive flexibility".¹⁶⁵ Decision-making and the management of information becomes increasingly difficult when confronted with complex systems; "imagined advantages" of a decision often do not correspond with the "unintended consequences" which occur when unpredictable feedback mechanisms within the system are at work.¹⁶⁶ A further dimension is added with the realisation that unexpected, sometime catastrophic events with a strong impact (which, as we have seen, were also especially relevant time and again in Byzantine history) occur more frequently than traditional probability theory has estimated; these are the "Black swans", as Nassim Nicholas Taleb has labelled them in his bestselling book on "the impact of the Highly Improbable". Not taking them into account can prove

¹⁶³ PIERSON, *Politics in Time* 17–53; P. BURKE, *History and Social Theory*. Ithaca, New York ²2005, 145; HATCHER – BAILEY, *Modelling the Middle Ages* 216–217. Cf. also HALDON, *The Byzantine Empire* 223, 232–233, on the "theory of the competitive selection of social practices" by W. G. RUNCIMAN (*A Treatise on Social Theory*, Vol. II: *Substantive Social Theory*. Cambridge 1989, esp. 37–48).

¹⁶⁴ PIERSON, *Politics in Time* 38–39.

¹⁶⁵ K. R. DARK, *The Waves of Time. Long-term Change and International Relations*. London and New York 1998, 122, 129–131; SCHEFFER, *Critical Transitions* 243–250; BUCHANAN, *The Social Atom* 195.

¹⁶⁶ PIERSON, *Politics in Time* 15, 104; BURKE, *History and Social Theory* 150; BUCHANAN, *The Social Atom* 188–190.

fatal.¹⁶⁷ One example from the 14th century may illustrate this: **fig. 34a** depicts the development of the market price of Venetian Government Bonds (as percentage of par value) for the period between 1285 and 1399, **fig. 34b** the phase portrait of the attractor of the price trajectory; based on their long experience, Venetian investors were confident that the price for the bonds would range between 60 and 100 % of its par value, even in time of war or crisis – until in 1379/1380 the market almost collapsed and the price went to regions where it never had gone before; only at the end of the century, as we can see, the trajectory began to return to more convenient regions. One decisive factor for this price slump was the Black Swan of the Genoese surprise attack on the island of Chioggia, which controlled the southern entrance to the Venetian Lagoon, on the 16th of August 1379; this operation brought Venice almost to its knees (Genoese allies blockaded the city from the other sides), and only in June 1380, the Genoese troops were forced to surrender. The war had exhausted the financial power of the Venetian state (the public debt – the “Monte Vecchio” – climbed from 3 to 5 million ducats); in 1381, interests on the bonds were suspended, in 1382 the annual interest rate was reduced from 5 to 4 and finally 3 per cent – it took Venice 20 years to bring its finances back to what investors had considered “normal” before “the highly improbable” happened in 1379.¹⁶⁸

Nevertheless, actors have to reduce the complexity and to work also with “imperfect information” in order to make their decisions, and for this “the cultural matrix”, “organizational habits and routines”, “tradition and culture” and “rules of thumbs” play an important role (contemporary social and economic research calls this “bounded

¹⁶⁷ N. N. TALEB, *The Black Swan. The Impact of the Highly Improbable*. London – New York 2008, esp. 229–266; I. BREMMER – P. KEAT, *The Fat Tail. The Power of Political Knowledge in an uncertain world*. Oxford 2009, 17–24; S. ALBEVERIO – H. KANTZ – V. JENTSCH (eds.), *Extreme Events in Nature and Society*. Berlin 2006; HATCHER – BAILEY, *Modelling the Middle Ages* 237. For an analysis of such “power law distributions” of events in contrast to the traditional “Gaussian” one cf. also M. E. J. NEWMAN, *Power laws, Pareto distributions and Zipf’s law* (http://arxiv.org/PS_cache/cond-mat/pdf/0412/0412004v3.pdf), and A. CLAUSET. – C. ROHILLA SHALIZI – M. E. J. NEWMAN, *Power-law distributions in empirical data* (http://arxiv.org/PS_cache/arxiv/pdf/0706/0706.1062v2.pdf). For the relevance of “exogenous shocks” for institutional dynamics cf. also GREIF, *Institutions and the Path to the Modern Economy* 220.

¹⁶⁸ KEDAR, *Merchants in Crisis* 17–19 and also 139–141 (for the data); F. C. LANE, *Venice. A Maritime Republic*. Baltimore 1973, 189–197; R. C. MUELLER, *The Venetian Money Market: Banks, Panics, and the Public Debt, 1200–1500* (*Money and Banking in Medieval and Renaissance Venice*, Vol 2). Baltimore 1997, 459–480. A paper on “Extreme Events in Byzantine and Medieval History” is in preparation by J. Preiser-Kapeller.

rationality").¹⁶⁹ But decision-making on this basis becomes problematic as soon as traditions and rules do not produce adequate outcomes when confronted with complex reality. As the first Palaiologoi and the first Aragonese rulers of Sicily attempted to stabilize their new regime by distributing resources and power among their aristocratic followers, they acted rationally within their traditional framework¹⁷⁰; yet they initiated a development which proved fatal under changing conditions; the dynamics of aristocratic networks led to fragmentation as the ability of the central nodes to maintain control collapsed (see above) because of "Black Swans" such as "accidents of heredity" and "royal minorities" (after the death of Andronikos III in 1341).¹⁷¹ And the "aristocratic matrix" produced responses to the impacts of the 14th century crisis which further eroded the polity's ability to sustain its existence against increasing external threat.

That other political and economic reactions were at least imaginable (maybe less realisable), we learn not only from the proposals of Plethon and Bessarion for 15th century Morea (see above)¹⁷², but from the historiographic work of the most prominent proponent of the aristocracy during the civil wars of the mid-14th century himself, John Kantakuzenos. He insinuates that the most energetic proponent of the opposing Palaiologan faction, Alexios Apokaukos (d. 1345), who was strongly engaged in financial and commercial business and since 1342 tried to rebuild Byzantine maritime power, which had been neglected since the time of Andronikos II because of its costs, "decided to shift his whole power to the sea and to transform the state into a tyranny. First, he wanted to move together sailors and marines and use them to man the ships and for his own protection against the conspirators. He wanted the mainland to be totally neglected, and (the state) to be based entirely on the islands and the sea. The Byzantines should be encouraged to live entirely from the sea and maritime trade"; for this purpose, Apokaukos also intended to use the sums he confiscated from opposing aristocrats and

¹⁶⁹ WILKINSON, *An Introduction to Behavioral Economics* 84–148, esp. 98; MAINZER, *Thinking in Complexity* 335–336; cf. also BURKE, *History and Social Theory* 160–163, for the relevance of cultural patterns for historical change.

¹⁷⁰ Cf. ANGELOV, *Imperial Ideology and Political Thought* 134–155, 204–252 for the attempt of Theodore II Laskaris (1254–1258) to implement politics and political thinking aimed against the predominance of aristocratic power relations – which finally led to the "aristocratic reaction" under the leadership of Michael (VIII.) Palaiologos, and 270–278 for Byzantine critics of Michael's pro-aristocratic politics. Cf. also Kl.-P. MATSCHKE, *Regierungsversprechen und Regierungverhalten in der frühen Palaiologenzeit*, in: W. SEIBT (ed.), *Geschichte und Kultur der Palaiologenzeit* 133–144.

¹⁷¹ For the general relevance of these phenomena cf. WATTS, *The Making of Polities* 281–282.

¹⁷² See also ANGELOV, *Imperial Ideology and Political Thought* 253–309, for earlier critics of the first Palaiologoi and their pro-aristocratic politics, and MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 344–365, for critics in the second half of the 14th century.

to raise taxes.¹⁷³ John Kantakuzenos of course presents this plan in a polemic fashion. If Apokaukos was actually intending such a dramatic transformation of the Byzantine polity, which would have changed the balance of power against the landed aristocracy to the benefit of the new commercial circles with whom he himself had aligned, is hard to say. As Angeliki Laiou has stated, "such a state would necessarily be tied to commerce, not to agriculture, in emulation of the maritime cities of Italy, and it might well have been westward-looking".¹⁷⁴ It may be ironic that the result of the civil war between the factions of Kantakuzenos and the Palaiologoi partly resembles Apokaukos' vision: the loss of major parts on the mainland and the reduction of the state to various seaport cities which necessitated a partial reorientation of the magnates to commercial activities (and Kantakuzenos himself – unsuccessfully – attempted to revitalise Byzantine sea power during his reign of 1347 to 1354, see also below¹⁷⁵) – yet the Byzantines remained junior partners of the Italians and were not able to become a competitive commercial and maritime force of their own as Apokaukos may have intended.

4.3 The scale and scope of Byzantium in the face of crisis

Finally, one has to take into account the scope of action which was left for Byzantium with regard to the scale of its resources. As has been stated above, the Empire before the 1340s may have been reduced to a regional power in South-eastern Europe, but it was still able to maintain armed forces (sometimes) sufficient for defence and even temporary expansion (to Epirus and Thessaly) and to mint its own gold coins (the *hyperpyron*), albeit at a debased rate in relation to the now dominant ducat of the Venetians; after the civil wars between 1341 and 1354, it was not able to do any of this.¹⁷⁶ So what was the scale of some indicators of the Byzantine state's power in comparison with other polities of the 14th century?

Nikephoros Gregoras informs us, that Emperor Andronikos II attempted a fiscal reform in ca. 1321 and was able to rise the sum of 1,000,000 hyperpyra a year (at this time ca. 600,000 Venetian ducats), "*out of which the senior emperor [Andronikos II] intended to*

¹⁷³ Ioannes Kantakuzenos, *Historia* III, 87 (Ioanni Cantacuzeni Eximperatoris Historiarum Libri IV, ed. L. SCHOPEN. Bonn 1831, II, 537, 7–10); MATSCHKE, Johannes Kantakuzenos, Alexios Apokaukos und die byzantinische Flotte 307–328.

¹⁷⁴ LAIOU, Political-Historical Survey 289–290. Cf. also A. P. KAZHDAN, The Italian and late Byzantine city. *Dumbarton Oaks Papers* 49 (1994) 1–22, for a comparative study.

¹⁷⁵ NICOL, *The Last Centuries* 220–225.

¹⁷⁶ LAIOU – MORRISSON, The Byzantine Economy 215–223. Cf. also D. M. NICOL, A. D. 1354 – *Annus fatalis* for the Byzantine Empire, in: W. SEIBT (ed.), *Geschichte und Kultur der Palaiologenzeit* 163–168.

maintain twenty ships on a permanent footing against enemies on the seas and in coastal areas, a land army of thousand cavalymen on a permanent footing in Bithynia, and of two thousand on the same footing in Thrace and Macedonia. He intended the moneys remaining over to be used up in expenses for ambassadors arriving from wherever at whatever time, in annual payments to surrounding peoples, and in the myriad other expenses deriving from imperial affairs." Michael Hendy has calculated on the basis of contemporary information on pay rates that the costs for 20 war ships could have ranged between 74,400 hyperpyra and 186,000 hyperpyra per year, for 3,000 cavalymen between 90,000 and 225,000 hyperpyra, with a greater probability for the higher values (thus a total of 441,000 hyperpyra).¹⁷⁷ Therefore, as for most other polities of the period, military expenditures accounted for the largest part of expenses; they could even put a larger strain on the state's budget: the pay stipulated for the Catalan Company (1,500 cavalymen, 4,000 men infantry, 1,000 other foot soldiers) amounted to 300,000 hyperpyra every four months in 1303, a sum Andronikos II was not able to provide for a long time.¹⁷⁸ Also the "annual payment to surrounding peoples" (in the form of tribute) could be a heavy load, as Hendy demonstrates with the example of the 120,000 hyperpyra Andronikos III in 1333 agreed to pay per year to the Ottomans for the remaining possessions in Bithynia.¹⁷⁹ Obviously, the Emperor's revenues often could not match expenditures in the early 14th century; sometime, rulers appealed to the assemblies of the population of the capital to provide additional money for the state, but most times without success.¹⁸⁰ So they tried to raise additional taxes, but this often met resistance and could undermine the state's position in sensitive areas such as Western Asia Minor.¹⁸¹ Another mean of choice was the debasement of coins; the gold content of the hyperpyron fell from from 16 carats under John III Dukas Vatatzes, to 15 carats

¹⁷⁷ Nikephoros Gregoras, *Historia* VIII, 6 (Nicephori Gregorae Byzantina Historia, ed. L. SCHOPEN. Bonn 1829, I, 317, 14–318, 5); HENDY, *Studies in the Byzantine Monetary Economy* 157, 161–164 (with English translation).

¹⁷⁸ HENDY, *Studies in the Byzantine Monetary Economy* 223–224; BARTUSIS, *The Late Byzantine Army* 78–81, 148; ANGELOV, *Imperial Ideology and Political Thought* 291.

¹⁷⁹ HENDY, *Studies in the Byzantine Monetary Economy* 164, 266.

¹⁸⁰ On the relevance of such assemblies cf. C. N. TSIRPANLES, *Byzantine Parliaments and Representative Assemblies from 1081 to 1351*. *Byzantion* 43 (1973) 432–481. For representative assemblies and their role in taxation in the medieval West cf. for instance: L. VONES – L. GONZÁLEZ ANTÓN, *Art. Cortes*. *Lexikon des Mittelalters* III, 285–292; WAUGH, *England in the reign of Edward III* 193–210.

¹⁸¹ HENDY, *Studies in the Byzantine Monetary Economy* 230–231, 244, 298; NICOL, *The Last Centuries* 220.

under Michael VIII and 14-12 carats under Andronikos III until 1308; this process finally led to the end of Byzantine gold coinage after 1353.¹⁸²

So was the Byzantine polity not in the financial and economic condition to withstand the challenges of crisis even before the fatal years of 1341 to 1354? Georg Ostrogorsky and others have compared the revenues reported for Andronikos II with estimates on the state income for earlier Byzantine centuries (when it could have amounted to 7-8,000,000 hyperpyra of finest quality) in order to illustrate the presumably sad condition of Byzantium's finances in the early 14th century.¹⁸³ But it seems more appropriate to compare the scale of revenues reported by Gregoras with other data on the income of rulers and polities at that time; doing this, a more "positive" image emerges.

Based on far more detailed source evidence than for Byzantium, the estimate for the "normal" annual royal revenues under King Edward I of England (1272–1307) is 67,500 pounds sterling (ca. 450,000 ducats), under his grandson Edward III (1327–1377) 100,000 pounds sterling (ca. 670,000 ducats).¹⁸⁴ In France, the royal revenues fell from a height of ca. 890,000 ducats under Philipp IV (1285–1314) to ca. 470,000 ducats (281,500 livre tournois) under Charles IV (1322–1328) and rose again to ca. 710,000 ducats under Philipp V (1328–1350), who added the possessions of the house of Valois to the royal domains.¹⁸⁵ On a smaller scale were the annual revenues of the Kings of Naples and of Sicily after the division of the two territories in the aftermath of the Sicilian Vespers 1282, with a maximum of ca. 50,000 *onze* (250,000 ducats) for Naples

¹⁸² HENDY, Studies in the Byzantine Monetary Economy 237–238, 439–447, 526–547. On the general „temptation“ of coin debasement in the Middle Ages cf. Th. J. SARGENT – F. R. VELDE, The Big Problem of Small Change. Princeton – Oxford 2002, 32–36, and 69–99, and 174–177 also on the introduction of overvalued coins (*torneselli*) by the Venetians in their colonies in the Aegean since 1353, which led to "inflationary effects" in Greece in the following decades.

¹⁸³ Ostrogorsky, Geschichte 413–414; BALOGLOU, Georgios Gemistos-Plethon 28. Cf. HENDY, Studies in the Byzantine Monetary Economy 154–200, on the budget in earlier centuries.

¹⁸⁴ WAUGH, England in the reign of Edward III 179; PRESTWICH, Plantagenet England 269 – 278, 287 – 289; HARRISS, Shaping the Nation 58–61; IDEM, Art. Finanzwesen, -verwaltung. England. *Lexikon des Mittelalters* IV, 463–465; J. BRAUER – H. VAN TUYLL, Castles, Battles and Bombs. How Economics explains Military History. Chicago – London 2008, 54. For exchange rates between the various currencies mentioned on the following pages cf. P. SPUFFORD, Handbook of Medieval Exchange. London 1986; HUNT, The Medieval Supercompanies 266–267; C. MORRISON, Coin Usage and Exchange Rates in Badoer's Libro dei Conti. *Dumbarton Oaks Papers* 55 (2001) 217–245.

¹⁸⁵ J. B. HENNEMAN, Jr., France in the Middle Ages, in: R. BONNEY (ed.), The rise of the fiscal state in Europe, c. 1200–1815. Oxford 1999, 109–110; J. EHLERS, Die Kapetinger. Stuttgart 2000, 202–203; G. SMALL, Late Medieval France (*European History in Perspective*). Houndsmill 2009, 106–107; N. BULST, Art. Finanzwesen, -verwaltung. Frankreich. *Lexikon des Mittelalters* IV, 461–462.

and ca. 20,000 *onze* (100,000 ducats) for Sicily.¹⁸⁶ The scale of state revenues of the Italian commercial centres is impressive in relation to the size of their territory and population: around 1335, the annual regular income of the republic of Florence, then the most important centre of international banking, as we have seen, amounted to ca. 300,000 florins (which equals the same sum of ducats).¹⁸⁷ And the Republic of Venice was able to handle a public debt of 1,000,000 ducats in 1313, the Republic of Genoa even a public debt of ca. 2,290,000 ducats in 1340.¹⁸⁸

Thus, the Byzantine imperial income reported for 1321 would have been in the order of magnitude of the two most powerful monarchies of Western Europe at this time – England and France (see **fig. 35**). Even if we allow for an especially high level of income in that year due to the fiscal efforts of Andronikos II or for certain amount of exaggeration on the side of Gregoras¹⁸⁹, the scale of the Emperor's revenues may have been "small" in comparison with the early and middle Byzantine centuries, but certainly within the range of income we observe for contemporary European polities. This becomes even more astonishing if we consider that England and Wales (ca. 151,000 km²) around 1300 had ca. 4 to 5 million inhabitants, and that the territories under the direct rule of the King of France in 1328 compassed ca. 320,000 km² and around 14 million inhabitants, while Byzantine Emperor in 1321 may have ruled over ca. 100,000 km² (see **fig. 31**) and maybe 2 to 3 million people if we presume a population density of 20 to 30 per km², which according to Johannes Koder seems possible for the Byzantine areas in this period.¹⁹⁰ To illustrate the theoretical economic potential of the "Romania" we may add that the annual revenues of Sultan Mehmed II (1451-1481), who ruled over all former core areas of Byzantium in Asia Minor and in South-eastern Europe, are

¹⁸⁶ N. KAMP, Art. Steuerwesen. Königreich Sizilien. *Lexikon des Mittelalters* VIII, 148–149; EPSTEIN, An island for itself 36–54.

¹⁸⁷ NAJEMY, A History of Florence 119, 123. The annual cost for 1,000 cavalymen in the service of Florence is calculated at this time with 100,000 florins.

¹⁸⁸ F. C. LANE, Venice. A Maritime Republic. Baltimore – London 1973, 177; M. E. MALLETT – J. R. HALE, The Military Organization of a Renaissance State. Venice c. 1400 to 1617 (*Cambridge Studies in Early Modern History*). Cambridge 1984, esp. 128–131 (on the financial system of the Venetian state); St. A. EPSTEIN, Genoa and the Genoese, 948–1528. Chapel Hill – London 1996, 192–193.

¹⁸⁹ Mark C. Bartusis believes that the "normal" revenues were maybe only half or even one-third of the sum collected in 1321, but he does not give any further reasons for this assumption, cf. BARTUSIS, The Late Byzantine Army 148.

¹⁹⁰ B. M. S. CAMPBELL, Benchmarking Medieval Economic Development: England, Wales, Scotland, and Ireland, c.1290. *Economic History Review* 61/4 (2008) 924–941; N. BULST, Art. Frankreich. *Lexikon des Mittelalters* IV, 784; KODER, Der Lebensraum der Byzantiner 150–154.

estimated to have amounted to at least 2,000,000 ducats (ca. 3,000,000 hyperpyra of 1321; see **fig. 35**).¹⁹¹

Another question is of course the relation between the Emperor's financial potential and other power factors within Byzantium. Gregoras again informs us that in ca. 1348, the revenues of the Genoese colony of Galata from taxes on the sea trade (*ek ton phoron ... prosodon*) amounted to 200,000 hyperpyra (at that time, ca. 100,000 ducats), while the income of Constantinople only was 30,000 hyperpyra (ca. 15,000 ducats). In order to raise the attractiveness of Constantinople's ports, John Kantakuzenos attempted to reduce the custom rate (from presumably 10 %) to the one used in Galata (2 %), and to revitalise Byzantine maritime power; he had to abolish this politics after violent Genoese reaction. But what do these figures imply for the relation between the financial power of the Empire and the one of the Genoese of Galata? The most common interpretation is that, because Gregoras afterwards definitely speaks about custom rates, that 200,000 hyperpyra (100,000 ducats) were the income of Galata's government from its 2 % ad valorem due on trade in their port and 30,000 hyperpyra (15,000 ducats) the revenues from the 10% custom dues in the ports of Constantinople.¹⁹² But this would indicate a trade volume of 10,000,000 hyperpyra (5,000,000 ducats) for Galata, more than 8 times the entire imperial income of Andronikos II in 1321; thus the merchant activity of the Italians would have dwarfed the financial potential of Byzantium at an unprecedented scale.¹⁹³ But is this interpretation of Gregoras' figure as amount of custom dues income correct? For the same period we have data on the income of the 2.5 % ad valorem tax on trade in Genoa itself, which was farmed out to rich citizens; in 1348 (an average year within the data set between 1341 and 1370), it amounted to 34,636 Genoese lira (ca. 28,000 ducats) and the value for Genoese oversea trades in this year was therefore 1,385,400 lire (or ca. 1,108,000 ducats).¹⁹⁴ If the sum of 200,000 hyperpyra were the incomes from custom dues in Galata alone, the trade volume of the colony would have

¹⁹¹ Sp. VRYONIS, Laonikos Chalkokondyles and the Ottoman budget. *International Journal of Middle East Studies* 7 (1976) 423–432; F. BABINGER, Die Aufzeichnungen des Genuesen Iacopo de Promontori de Campis über den Osmanenstaat um 1475. Munich 1957, 62–72; F. BABINGER, Mehmed der Eroberer. Weltenstürmer einer Zeitenwende. Munich 1987, 484–489; H. INALCIK – D. QUATAERT (eds.), An Economic and Social History of the Ottoman Empire, Vol. I: 1300–1600. Cambridge 1994, 56, 77–83.

¹⁹² Nikephoros Gregoras, *Historia* XVII, 1–3 (ed. SCHOPEN II, 841, 12–843, 6); HENDY, *Studies in the Byzantine Monetary Economy* 157, 164; NICOL, *The Last Centuries* 221; LAIOU – MORRISSON, *The Byzantine Economy* 225; Nikephoros Gregoras, *Rhömäische Geschichte*, übersetzt und erläutert von J. L. van Dieten. Dritter Teil (Kapitel XII – XVII) (Bibliothek der Griechischen Literatur 24). Stuttgart 1988, 203 – 204 and 393–395 (Commentary).

¹⁹³ Cf. HENDY, *Studies in the Byzantine Monetary Economy* 590–602, on the "Latin investment" between the years 992 and 1204.

¹⁹⁴ EPSTEIN, *Genoa and the Genoese* 216–217.

been 4.5 times the one of Genoa itself, which seems improbable.¹⁹⁵ The figure in Gregoras' work therefore may have indicated rather the totality of revenues the government of Galata made from taxes on sea trade, not only the custom dues. Still, the scale of Latin wealth and economic activity in Byzantium was impressive. Andronikos II for instance could confiscate Venetian property from the colony in Constantinople alone worth 80,000 hyperpyra (ca. 53,000 ducats at this time); and John Kantakuzenos mentions that the island of Chios, rich inter alia because of its "virtual monopoly" on mastic and since 1346 under the control of a Genoese *Maona*, yielded 120,000 hyperpyra (60,000 ducats) per year.¹⁹⁶ Thus, the alleged intent of Apokaukos to ground Byzantine power on the commercial activity in the region after the example of the Italian city states (see above) may not seem so unrealistic any more (see **fig. 36**).

But Byzantine central power had not only to compete economically with the Venetians and Genoese, but also internally with the landowning aristocracy. Michael Hendy has collected some figures which may indicate the scale of aristocratic wealth in Byzantium: the annual revenues left to Constantine Palaiologos (PLP 21492), the younger son of Michael VIII, in 1282 amounted to 60,000 hyperpyra (ca. 40,000 ducats at this time); according to Kantakuzenos, the moveable fortune of the *protobestiarios* Andronikos Palaiologos (PLP 21435) in 1328, when it was confiscated by Andronikos III, amounted to 72,000 hyperpyra (ca. 42,000 ducats); and in 1341, the private fortune of the former tax official Theodoros Patrikiotes (PLP 22077), who planned to give financial support to Kantakuzenos, amounted to 140,000 hyperpyra (ca. 70,000 ducats).¹⁹⁷ The most famous description of the aristocratic wealth is the one of John Kantakuzenos himself with regard to his losses during the civil war, inter alia 5,000 pieces of cattle, 1,000 draft oxens, 2,500 brood-mares, 50,000 pigs and 70,000 sheep; unfortunately, he does not give a figure for his assets in cash or his annual revenues.¹⁹⁸ Besides the lay aristocracy, one has also to take into account the wealth of ecclesiastical owners, which were equally privileged by the first Palaiologan emperors: the oldest and richest monastery of Mount

¹⁹⁵ EPSTEIN, Genoa and the Genoese 230 – 231; cf. also J. DAY, Les douanes de Gênes, 1376–1377. 2 Volumes, Paris 1963, on the later volumes of trade.

¹⁹⁶ Ioannes Kantakuzenos, Historia II, 12 (ed. SCHOPEN I, 380, 1–3); HENDY, Studies in the Byzantine Monetary Economy 164, 282; J. KODER, Aigaion Pelagos (die nördliche Ägäis) (*Tabula Imperii Byzantini* 10). Vienna 1998, 144–148.

¹⁹⁷ HENDY, Studies in the Byzantine Monetary Economy 204–206, 241; MATSCHKE – TINNEFELD, Die Gesellschaft im späten Byzanz 42; WEISS, Kantakuzenos 57.

¹⁹⁸ Ioannes Kantakuzenos, Historia III, 24, 27 and 30 (ed. SCHOPEN II, 148–149, 164–165, 184–185); HENDY, Studies in the Byzantine Monetary Economy 207–208; WEISS, Kantakuzenos 12.

Athos for instance, the Megiste Laura, in 1321 was the owner of 185,000 *modioi*¹⁹⁹ (ca. 18,500 hectares) in Macedonia and on the island of Lemnos with a value of maybe 110,000 hyperpyra (ca. 68,000 ducats at this time) and an estimated annual yield of ca. 11,000 to 17,000 hyperpyra (ca. 6,800 to 10,000 ducats); in 1350, the totality of Laura's property amounted even to ca. 270,000 *modioi*.²⁰⁰ The scale of property of other monasteries was more modest, but still remarkable: the Athos-monastery Iviron owned 80,000 *modioi* in 1350, the Athos-monastery Vatopedi ca. 43,000 *modioi* in 1329 and Chilandar (another Athos-monastery) ca. 22,000 *modioi* in 1321; the property of the Ioannes Prodromos-Monastery near Serres in Macedonia was ca. 10,000 *modioi* in 1321 and more than 27,000 *modioi* in 1355.²⁰¹

But as the comparison between the figures specified by Gregoras for the imperial revenues in 1321 with contemporary data from other European polities relativized the impression of a "small scale" polity, information on aristocratic and ecclesiastical wealth in other regions of Late Medieval Europe puts the scale of this wealth in Palaiologan Byzantium in another perspective (see **fig. 37**). The data on the revenues of English Earls in the 14th Century for instance shows a comparative order of magnitude: the annual income of Earl Thomas of Lancaster (d. 1322), the richest aristocrat of his time, equated 80,000 ducats, the revenues of the Gilbert de Clare, Earl of Gloucester (d. 1314), whose estates compassed 18,800 acres (ca. 7,600 hectares), half that sum; in 1376, the revenues of the Black Prince Edward, son of King Edward III, amounted to ca. 67,000 ducats. Comparable was also the scale of ecclesiastic wealth; the annual receipts of the richest bishop in the Kingdom, the one of Winchester, amounted to ca. 36,000 ducats according to data from the years 1320, 1323, 1333 and 1346 (at the same time, his estates, which were not his only source of income, amounted to 8,200 acres or ca. 3,300 hectares), while the Archbishop of Canterbury had annual revenues of 30,000 ducats

¹⁹⁹ The terminus *modios* denotes several square measures (ranging from 888,73 to 1279,78 sq. m.) as well as measures of capacity (ranging from 11,389 to 17,084 liters, the latter figure for the most important *thalassios modios*) in Byzantium, cf. E. SCHILBACH, *Byzantinische Metrologie (Byzantinisches Handbuch 4)*. Munich 1970 59–67, 95–109; C. MORRISON – J.-CL. CHEYNET, Prices and Wages in the Byzantine World, in: LAIOU (ed.), *The Economic History of Byzantium* 817.

²⁰⁰ LAIOU, *The Agrarian Economy* 349–350 (with the estimates); N. SVORONOS, Le domaine de Lavra sous les Paléologues, in: P. LEMERLE – A. GUILLOU – N. SVORONOS – D. PAPACHRYSSANTHOU, *Actes de Lavra IV. Études historiques – actes serbes – compléments et index (Archives de l'Athos 11)*. Paris 1982, 65–173f, esp. 153–173f; K. SMYRLIS, La fortune des grands monastères byzantins (fin du Xe-milieu du XIVe siècle) (*Collège des France – CNRS, Centre de Recherche d'Histoire et Civilisation de Byzance, Monographies 21*). Paris 2006, 55; LAIOU – MORRISON, *The Byzantine Economy* 173–174.

²⁰¹ SMYRLIS, *La fortune des grands monastères byzantins* 40, 48, 88–95, 97. Cf. also MATSCHKE – TINNEFELD, *Die Gesellschaft im späten Byzanz* 57, on the relative resilience of ecclesiastical property in comparison to lay aristocratic property.

during the same period. The revenues of the Monastery of St. Peter in London (the Westminster Abbey) were ca. 11,000 ducats in early 14th century and therefore at the same scale as the ones of the Megiste Laura, while its estates compassed "only" 14,500 acres (ca. 5,870 hectares). The total annual income of the lay aristocracy, the higher clergy and the monasteries around 1300 has been estimated with 600,000 pounds sterling (ca. 4,000,000 ducats), almost nine times the annual revenues of the English king at this time.²⁰² Also in France we find a similar scale of aristocratic and ecclesiastical revenues; the Count of Forez in south-central France had an annual income of 12,000 livres tournois (ca. 20,000 ducats), the Count of the Champagne even of 60,000 livres tournois (ca. 100,000 ducats) around 1300, the archbishop of Reims of 12,000 ducats between 1299 and 1355, the bishop of Paris of 10,500 ducats between 1320 and 1350, the monastery of St. Denis in Paris even of 18,000 ducats between 1306 and 1364 (see **fig. 37**).²⁰³

Of course, these comparisons would be even more significant if we were able to make an extensive benchmarking of Byzantium and contemporary polities as Bruce M. S. Campbell has done for England, Wales, Scotland, and Ireland for the time around 1290; but for this kind of analysis we lack the appropriate data for the Byzantine case.²⁰⁴ Thus, we can only compare orders of magnitude for the income of the ruler, the foreign merchants and the great aristocratic and ecclesiastical owners. However, even this simple compilation of data may indicate that the Byzantine Empire was still on par with its contemporaries at the beginning of the 14th century with regard to the scale of as well as limitations to its economic potential. Aristocracies and ecclesiastical institutions were equally wealthy and powerful in other European polities, the financial means of other rulers were often equally insufficient to match the necessities of warfare and politics, as the case of Edward III for instance has shown (similar was the situation under his grandfather Edward I²⁰⁵ or in Venice after 1379, as we have seen above). The crises of

²⁰² PRESTWICH, Plantagenet England 355–361, 370–373; HARRISS, *Shaping the Nation* 99, 138; H. HOBERG, *Taxae pro communibus servitiis ex libris obligationum ab anno 1295 usque ad annum 1455 confectis* (*Studi e Testi* 144). City of Vatican 1949, 28, 133, 305; CAMPBELL, *English Seignorial Agriculture* 61; DYER, *Making a Living in the Middle Ages* 257; CAMPBELL, *Benchmarking Medieval Economic Development*, esp. 940.

²⁰³ NORTH, *Europa expandiert* 59; TURCHIN – NEFEDOV, *Secular Cycles* 112; HOBERG, *Taxae pro communibus servitiis* 93, 101, 187.

²⁰⁴ CAMPBELL, *Benchmarking Medieval Economic Development* 896–945.

²⁰⁵ BRAUER – VAN TUYLL, *Castles, Battles and Bombs* 68–69. Cf. LANDERS, *The Field and the Forge* 282–308, in general on the pressure of military expenditures on pre-modern states.

the 14th century tested also the limits of other polities to their utmost; the Kingdom of France, the most powerful monarchy in Western Europe in the period around 1300, was on the cusp of disintegration and foreign conquest in the last decades of the 14th and the first decades of the 15th century.²⁰⁶ Above, we have already observed the development in Sicily between 1330 and 1400; and John Watts has highlighted the general "vulnerability" of 14th century polities in Europe and the Mediterranean.²⁰⁷

5. Conclusion

Thus, the collapse of the Byzantine Empire between 1340 and 1453 may be better considered one of the many possible outcomes of the crises of the 14th century than a unique case of a polity programmed for destruction since the 10th, 11th or 13th century.²⁰⁸ As we have seen, internal structures of power relations, the collective action dilemma within the polity and the increasing "lack of unity and social cohesion", together with other factors (ideological ones, for instance) certainly impeded the adaptation of the "Byzantine system" in its entirety to changing, deteriorating circumstances with regard to climate, demography, economy and international environment²⁰⁹ – but so many of these factors did in other polities.

What may have been decisive for the "Byzantine attractor" was a special combination of external factors, compared with Western European polities for instance. And the politics of the external forces enhanced these tendencies of disintegration; Angeliki Laiou may be cited once more: "Without necessarily positing a cause-and-effect relationship, one may nevertheless suggest that the system of small political units was able to survive partly because the international market had no use for large, internally self-sufficient political units. Indeed, to the extent that such units tended to be protectionist, their interests would be opposed to those of the major economic players. Thus, as far as the surrounding economic circumstances were concerned, there was nothing to impose, elicit, or create favourable conditions for consolidation as opposed to fragmentation of political power."²¹⁰ Finally, the emergence of an expansionist polity whose development

²⁰⁶ Cf. SMALL, *Late Medieval France* 132–170. See also LIEBERMAN, *Strange Parallels* 182–205, for a comparative analysis of these "centuries of crisis" in France and Russia.

²⁰⁷ WATTS, *The Making of Polities* 285, and 196–201; NORTH, *Europa expandiert* 75–89, 114–133, 196–214 (for similar developments of the Iberian peninsula, in the Italian states and in Eastern Central Europe).

²⁰⁸ On the limitations of linear explanations cf. also HATCHER – BAILEY, *Modelling the Middle Ages* 231–233.

²⁰⁹ Cf. BUCHANAN, *The Social Atom* 196: "inequality tends to give both the powerful and the not powerful the incentive to undermine effective governing institutions to the detriment of the entire society".

²¹⁰ LAIOU, *Byzantium and the Neighboring Powers* 52.

of its instruments of power made it a superior competitor in the attempt to re-integrate the imperial sphere of Byzantium (which was of course the dream of its Emperors until the end) was decisive; "(...) it was the Ottomans, an outside power with a very considerable reservoir of human resources, and increasingly of economic resources, who carried out that imperative and fused the fragments of political power floating adrift in the geographic space of the former Byzantine Empire."²¹¹ As previous periods of crisis, their resolving initiated a new phase of the restoration of imperial central power in the "Romania", yet this time not by the hand of the *Rhomaioi*, but by the Ottomans.

On an individual or collective level, certain actors were able to adapt to changing circumstances to their own benefit; the village or the city, which surrendered to the Ottoman invaders under relatively favourable conditions, the aristocrat or abbot, who sought a compact with the Serbian or later Ottoman ruler, the nobleman, who allied with the Italian merchant forces, they all acted in their own interest, since they presumed that the Byzantine state was not able to guarantee their safety or status any longer versus these stronger competing powers; yet this started a negative feedback mechanism at the level of the Byzantine political entity, since such strategies further eroded its ability to find appropriate solutions for the crisis to the benefit of all members of society. The 14th century "Schumpeterian creative destruction" gave room for adaptation at the level of the individual "social structures" (to cite Epstein and Greif once more) at a rate which outrun attempts to adapt at the level of the central power.

As historical development within the complexity framework proves to be the outcome of the interaction of complex systems at various levels and timescales, monocausal or linear explanations models are inadequate for the analysis and the description of crisis, transformation or collapse, as also the Byzantine case clearly demonstrates. Neither was Byzantium programmed for doom since the 10th century nor was the downfall of the Byzantine polity the "logical" outcome of any one single factor; instead, the trajectory of the Byzantine system was one of the many possible outcomes of the confrontation of late medieval political, economic, social and ideological structures and frameworks with the dramatically changing environment of the 14th and 15th century. As Byzantium's fate in relation to the development of other late medieval polities demonstrates, the outcome of crisis – transformation or collapse –especially depends on the robustness and

²¹¹ LAIOU, *Byzantium and the Neighboring Powers* 52.

adaptiveness of social formations, networks and structures; in this respect, some elements of a political and social framework may prove more successful than others. Individuals, groups, institutions may adapt, while the political entity as such may fall; that is also the cause why there existed a "Byzantium after Byzantium" long after the fall of Constantinople.²¹²

²¹² N. JORGA, *Byzantium after Byzantium*. Oxford 2000.

Figures:

(Note: All figures are based on own calculations and were created by the author)

Fig. 1: Trajectories (upper row) and attractors (lower row) of the same process $[f(x) = Rx(1-x)]$ for $R = 2, 3.5$ and 3.9 and 100 timesteps (note the transition of the system from a linear attractor [a point] to a cyclic and finally to a chaotic one)

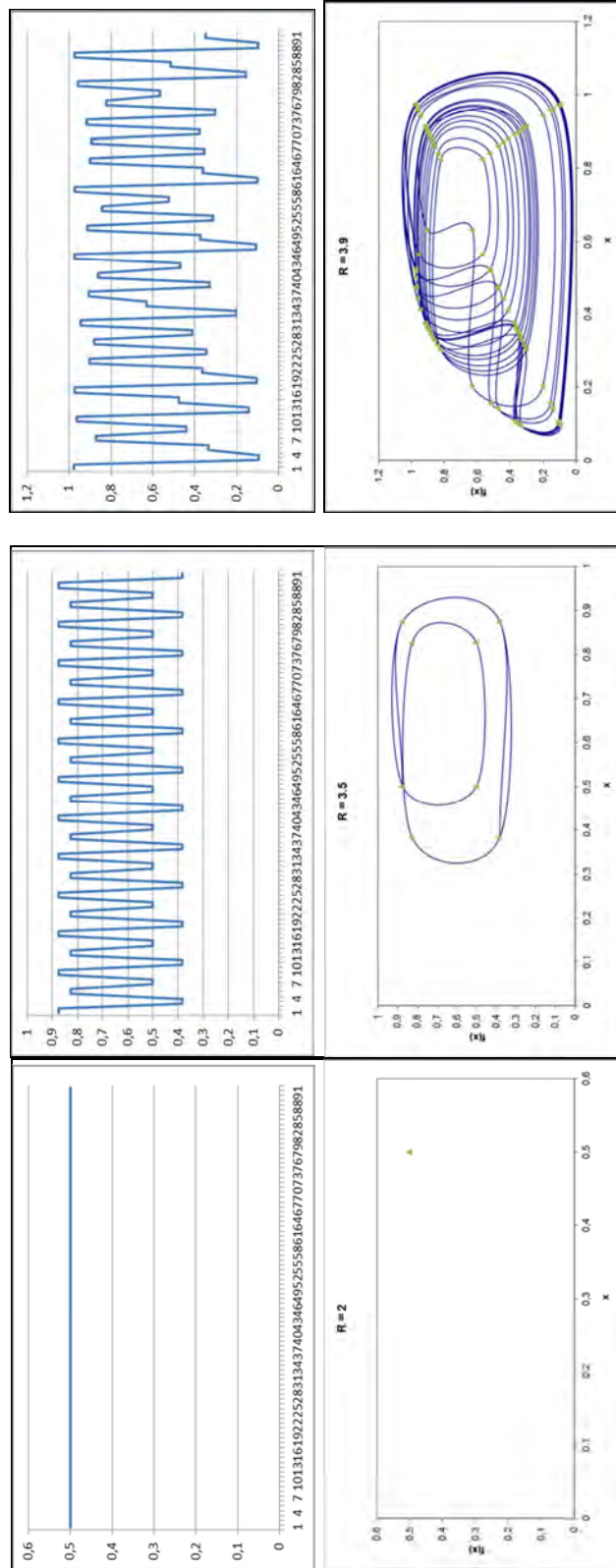


Fig. 2: Trajectories of the Turchin-model for population number (N), state income (S) and internal warfare (W) (for an annual rate of population growth $r = 0.01$) for 1000 years

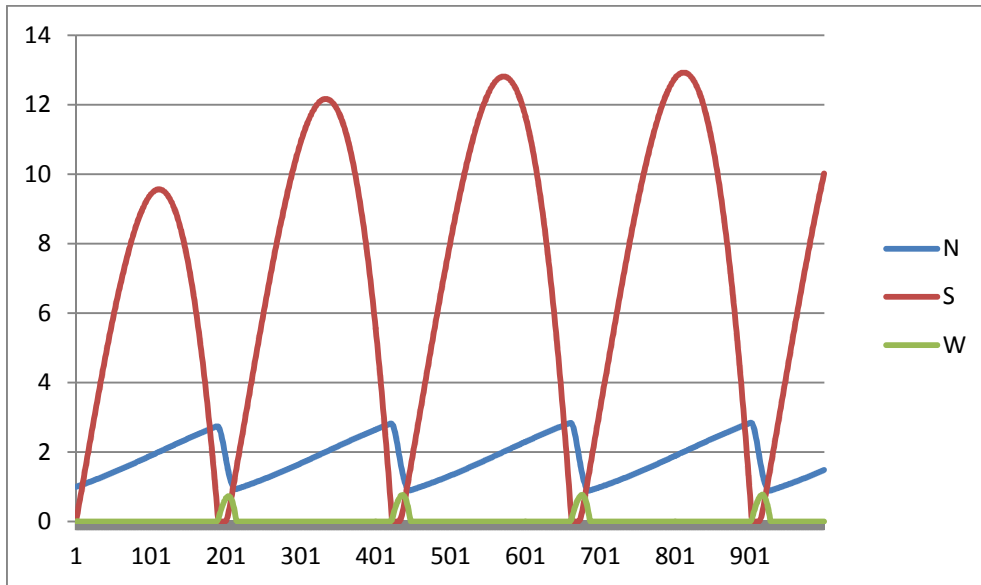


Fig. 3: Trajectories of the Turchin-model for population number (N), state income (S) and internal warfare (W) (for an annual rate of population growth $r = 0.015$) for 1000 years

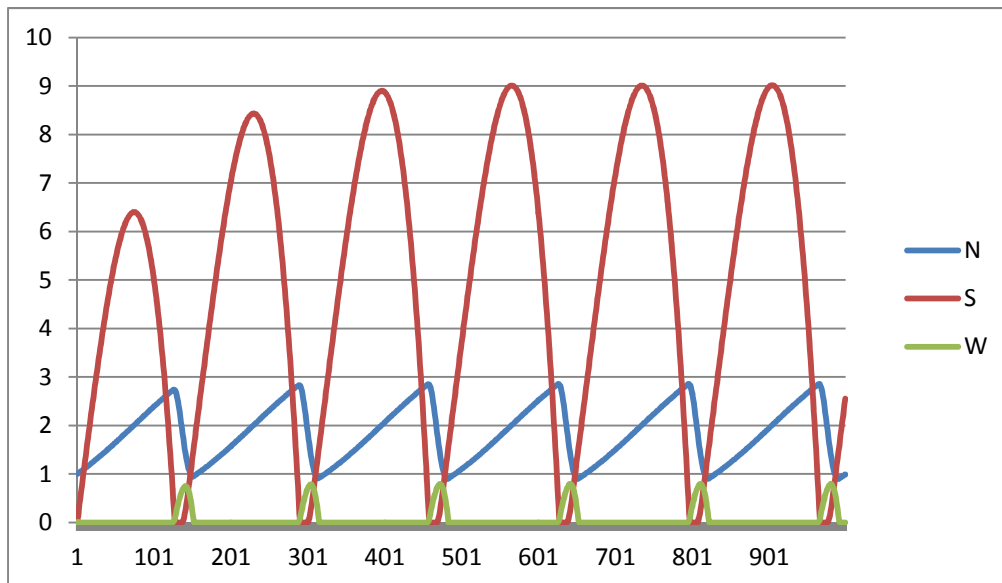


Fig. 4: Instability Index for Byzantium, 280–1400 AD

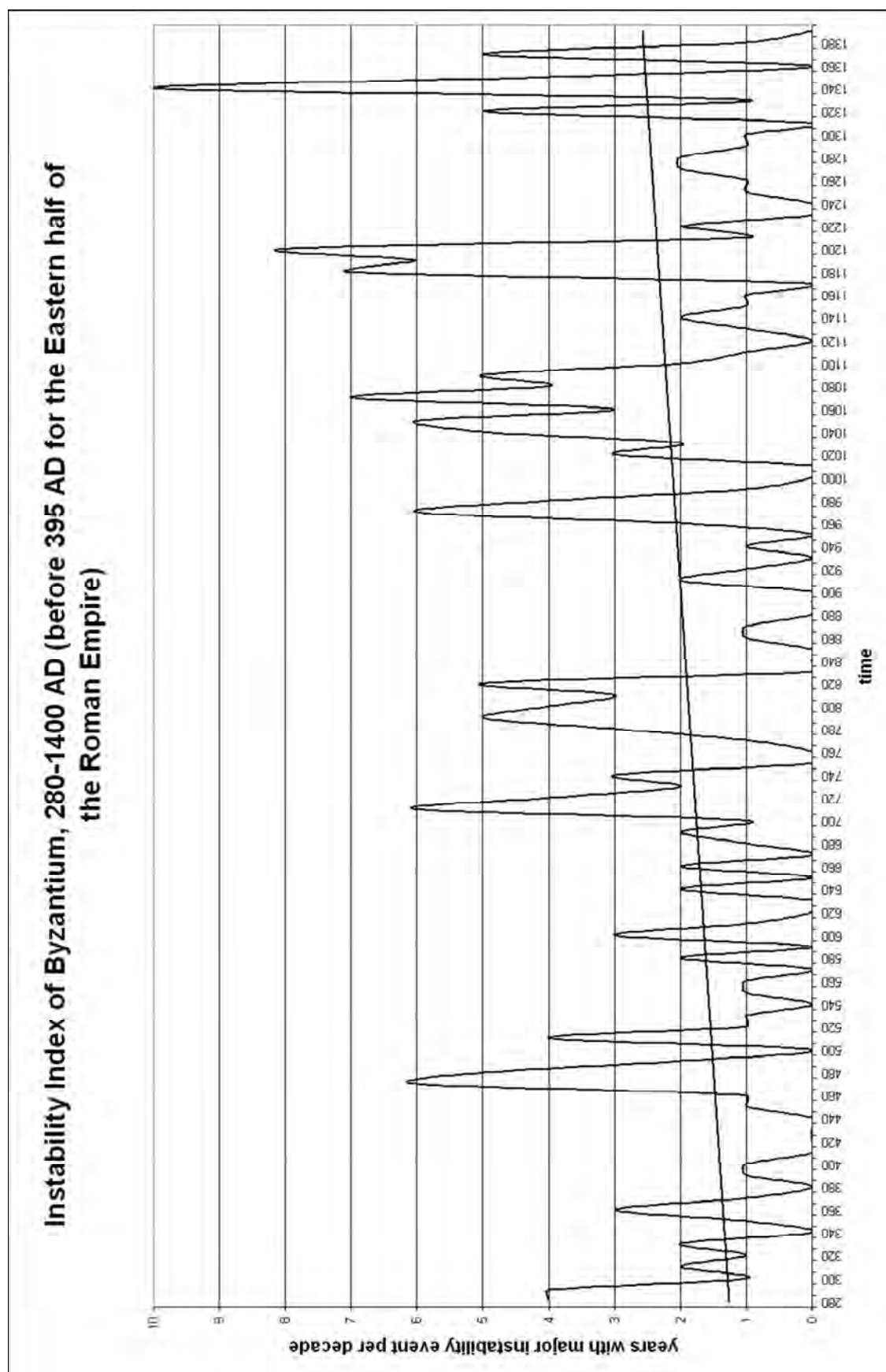


Fig. 5: Instability Index of Byzantium, 1150-1400 AD

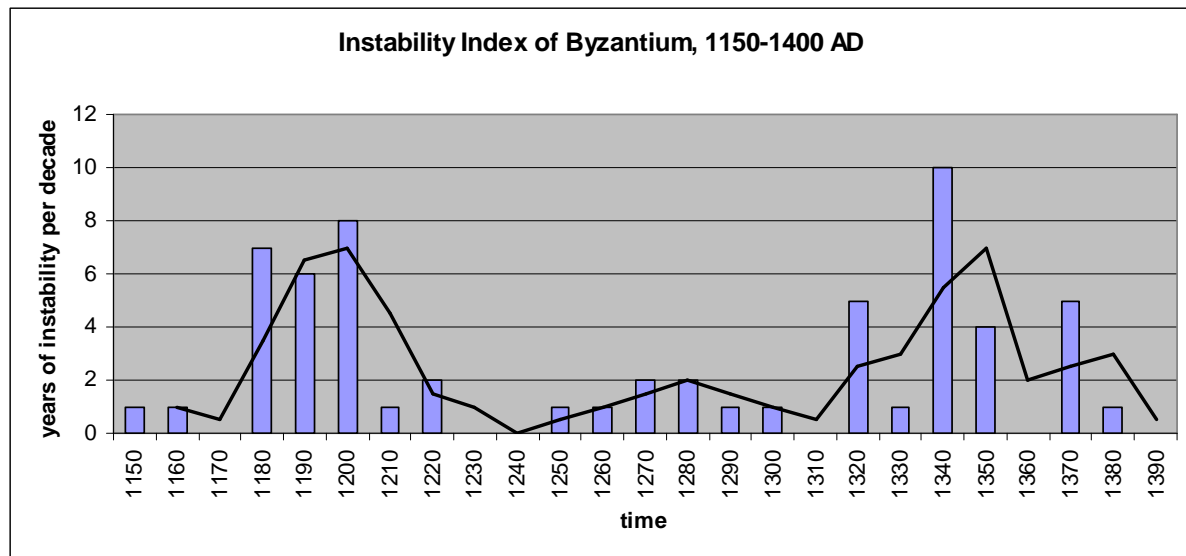


Fig. 6: Trajectories of one run of the randomized Turchin-model for population number (N), state income (S) and internal warfare (W) for the year 500 to 1000

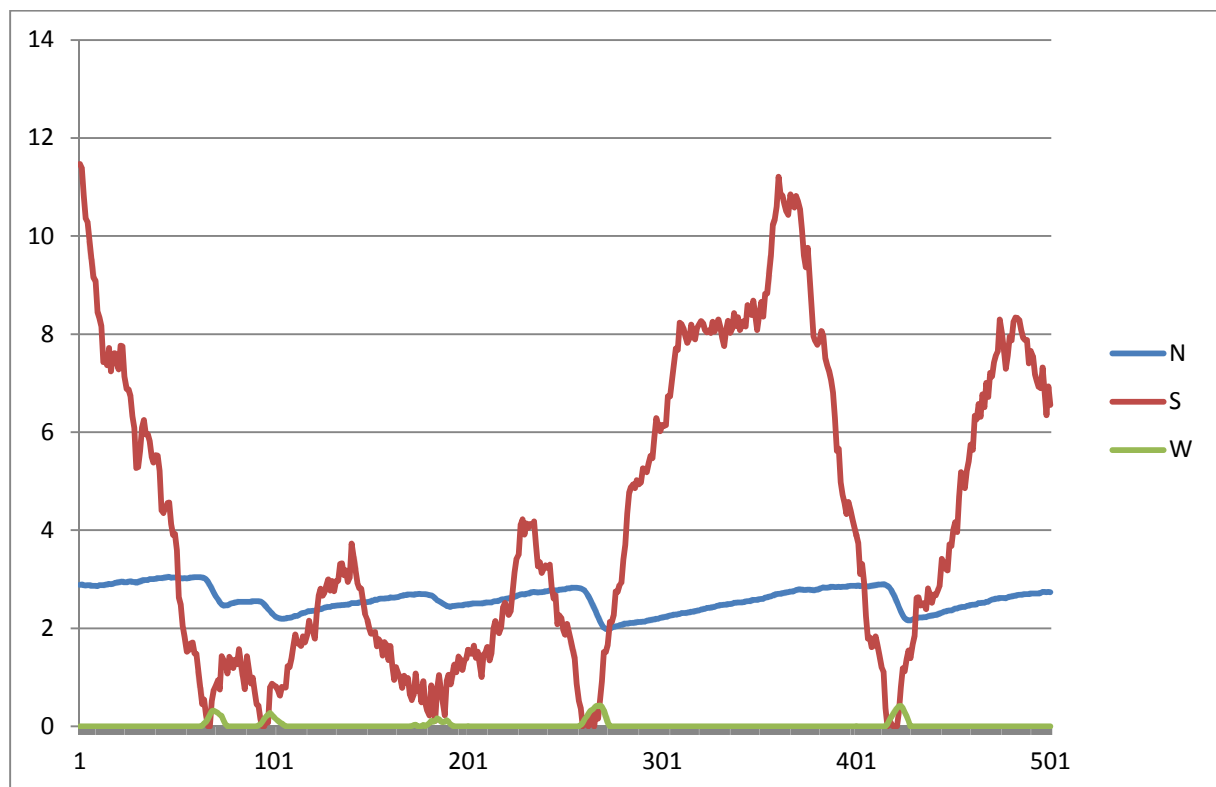


Fig. 7: Trajectories of one run of the randomized Turchin-model for population number (N), state income (S) and internal warfare (W) for the year 500 to 1000

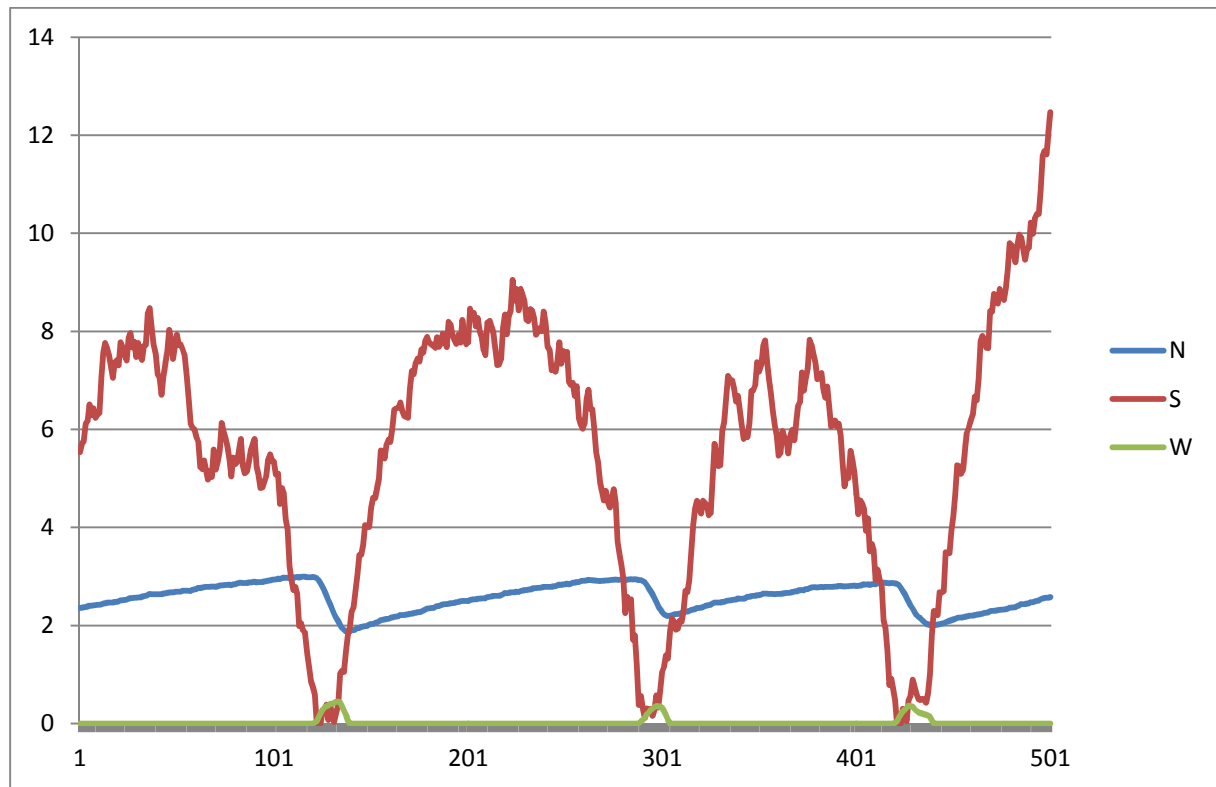


Fig. 8: Trajectories of one run of the randomized Turchin-model for population number (N), state income (S) and internal warfare (W) for the year 500 to 1000

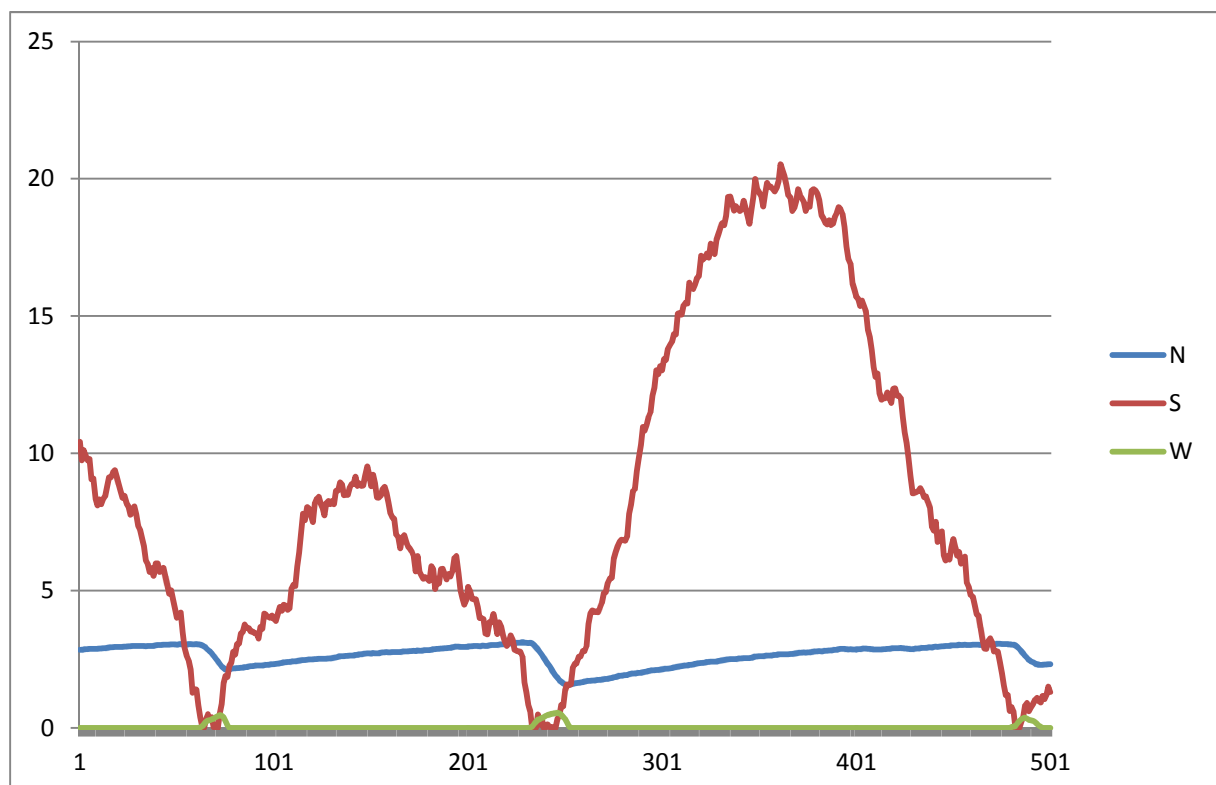


Fig. 9-11: Trajectories for internal warfare (W) for three runs of the randomized Turchin-model for 1000 years

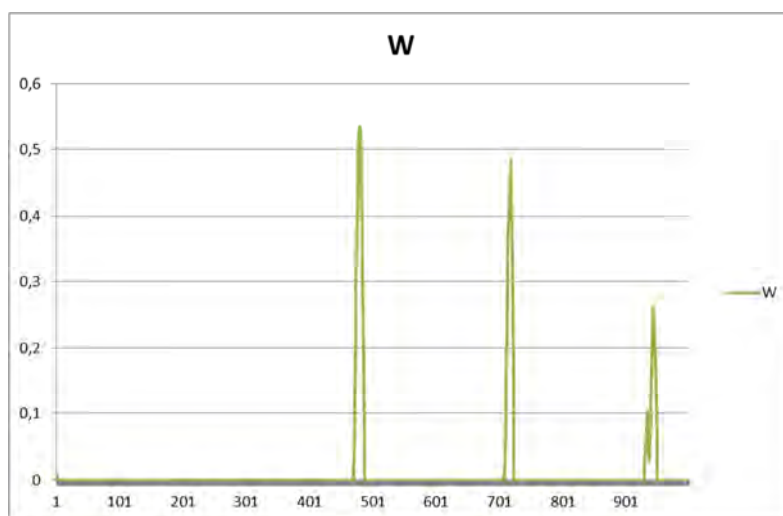
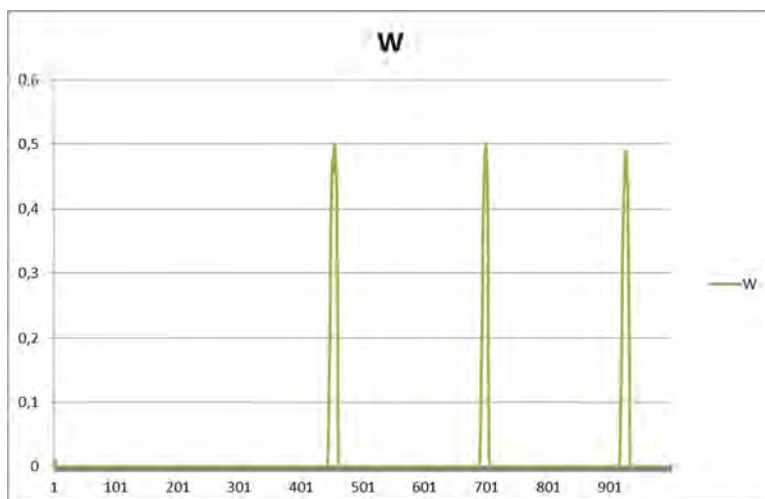
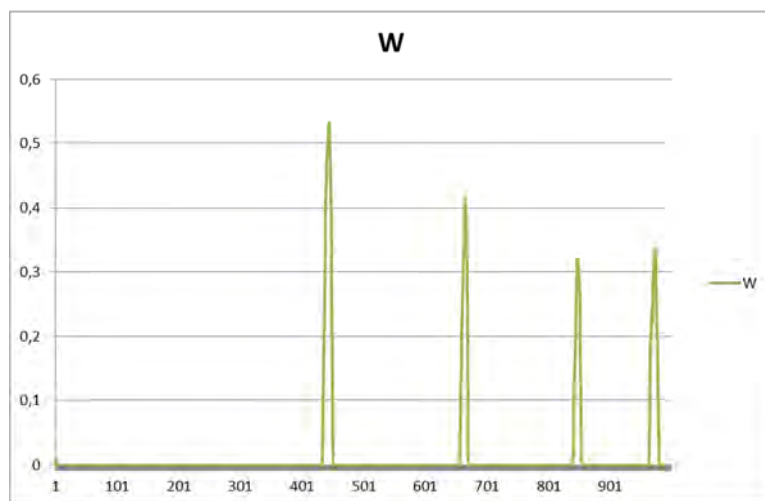


Fig. 12: Trajectories of one run of the randomized Turchin-model for population number (N), state income (S) and internal warfare (W) for 1000 years with the modification per capita taxation rate $\rho = 0$ if $S = 0$

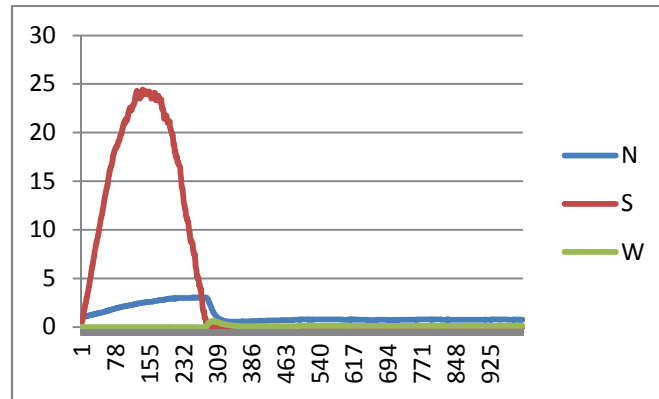


Fig. 13: Trajectories of the Turchin-model for population number (N), state income (S) and internal warfare (W) for the years 500 to 1000 (with reduction of the “carrying capacity” k from 4 to 2 at timepoint 300)

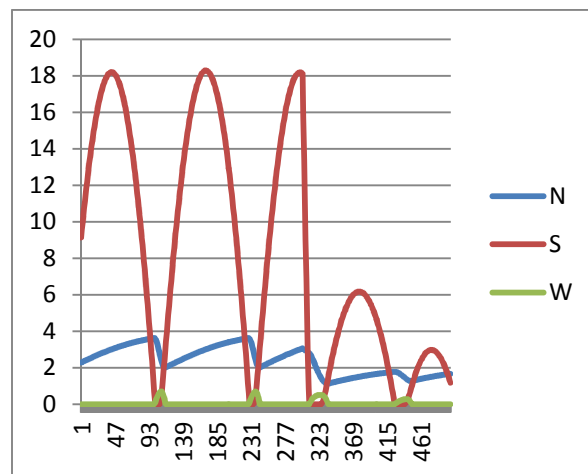


Fig. 14: Trajectories of the Turchin-model for population number (N), state income (S) and internal warfare (W) for the years 500 to 1000 (with reduction of the “carrying capacity” k from 4 to 2 at timepoint 300 and from 2 to 1 at timepoint 400)

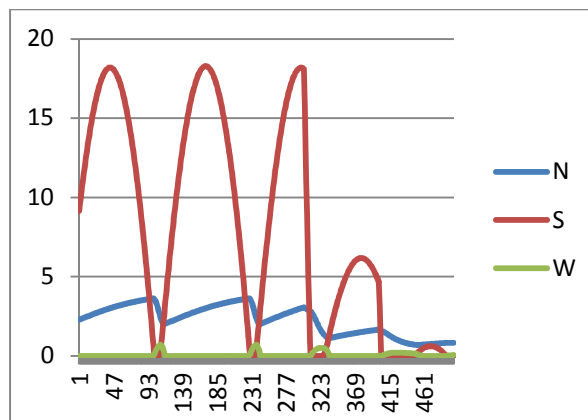


Fig. 15-18: Attractors of internal instability in the Turchin-model, in the randomized Turchin-model and for the instability indices of England (1130-1750) and of Byzantium (280-1400)

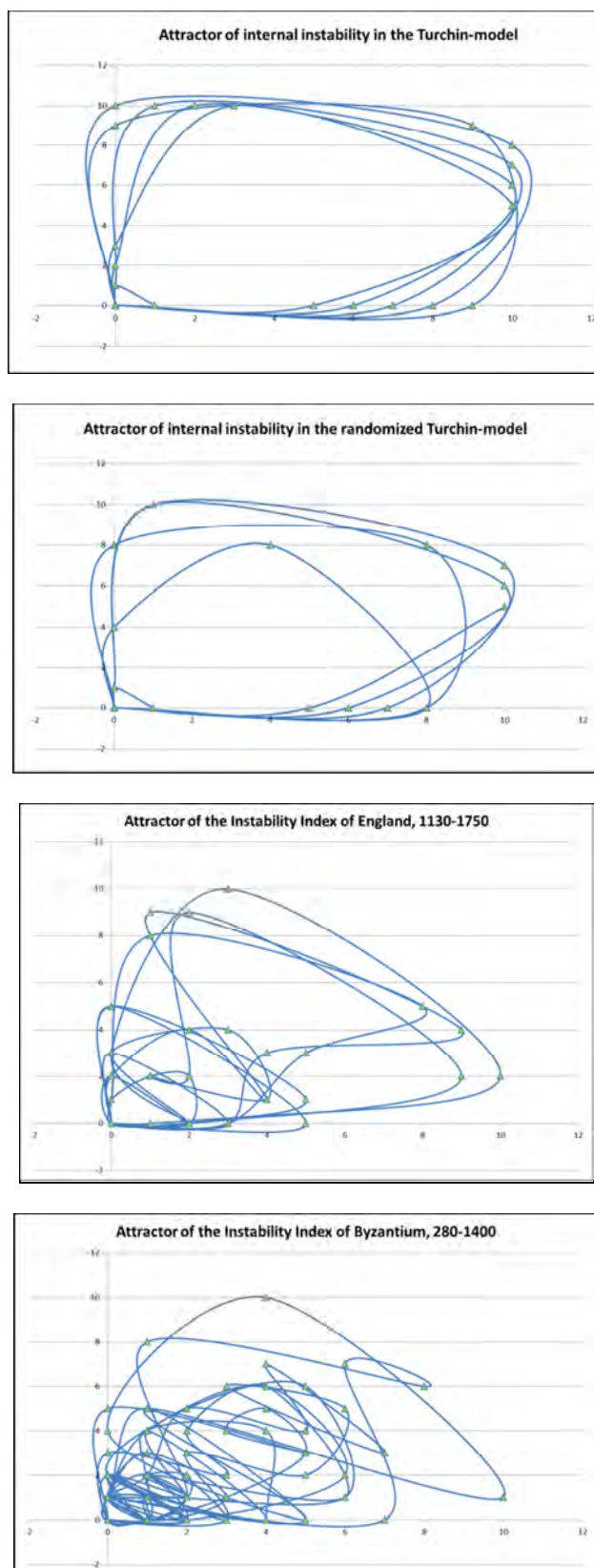


Fig. 19: The network of the Byzantine village priest Basileios Aroules in Rabolivos, Macedonia (1316)

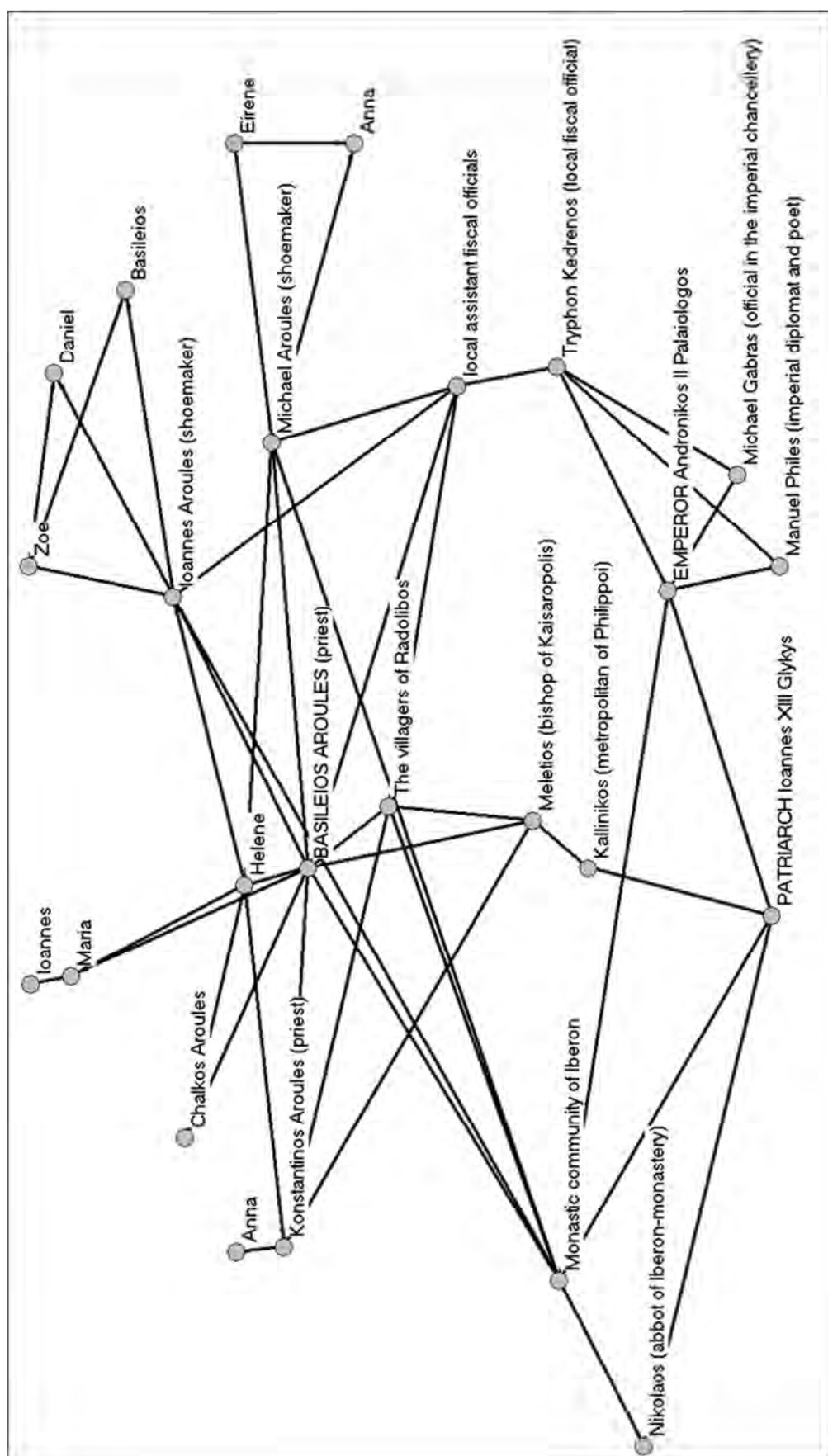


Fig. 20: Visualisation of the network of the *dynatoi* (the powerful), 1310-1341 (n = 187), with Emperor Andronikos II Palaiologos and Emperor Andronikos III Palaiologos as two centres of gravity

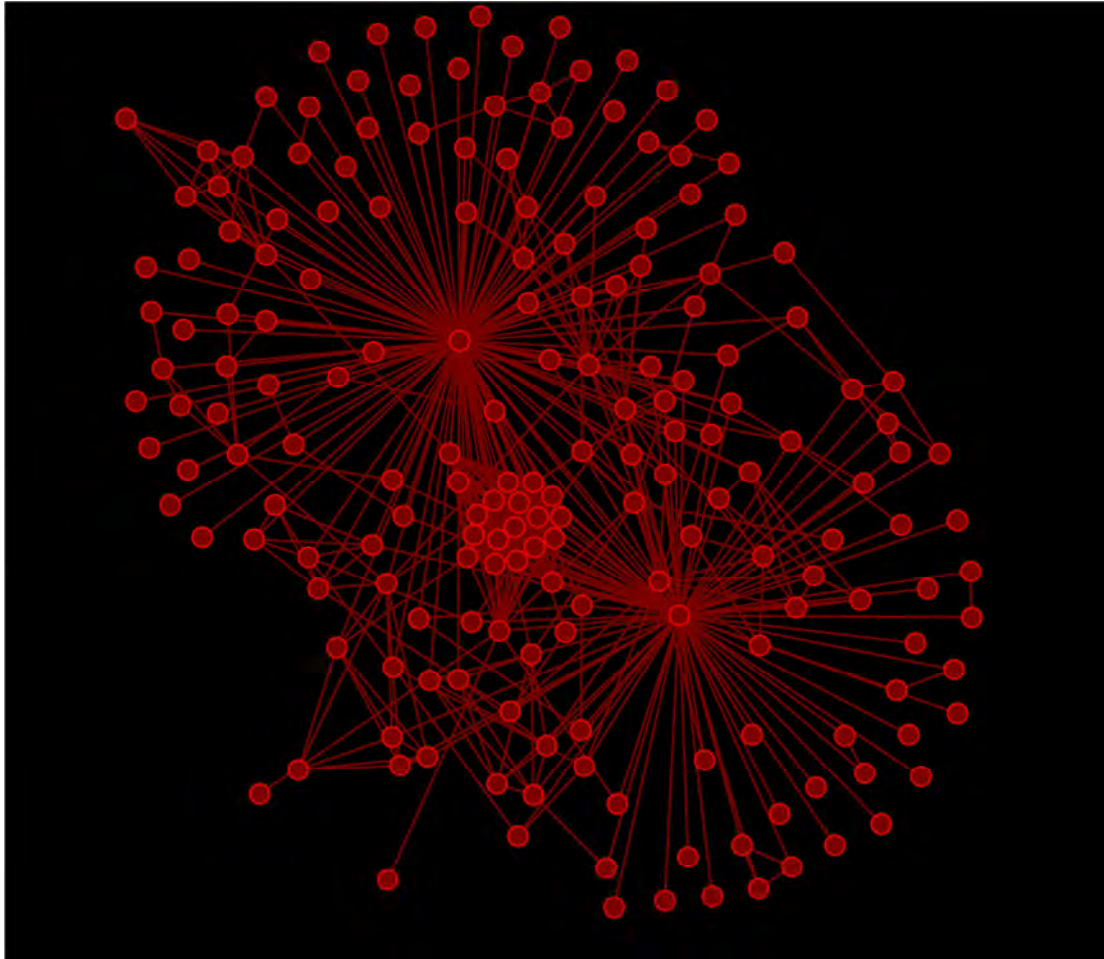


Fig. 21: A comparison between the network of the *dynatoi* and a random network with the same basic parameters

Network of the <i>dynatoi</i> (n = 187)	
Average path length	2.9254
Clustering Coefficient	0.2933
Average Degree	3.2567
Random network (n = 187)	
Average path length	4.4706
Clustering Coefficient	0.0146
Average Degree	3.2567

Fig. 22: Cumulative degree distribution for the random *dynatoi*-network

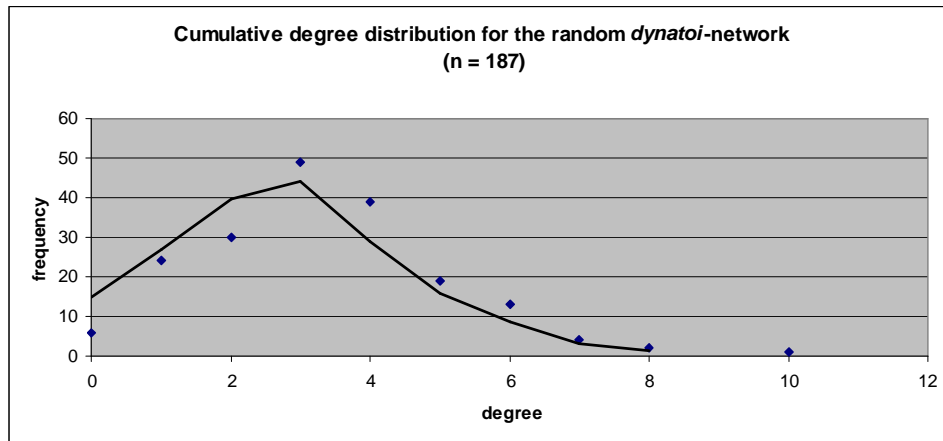


Fig. 23: Cumulative degree distribution of the network of *dynatoi*, 1310–1341

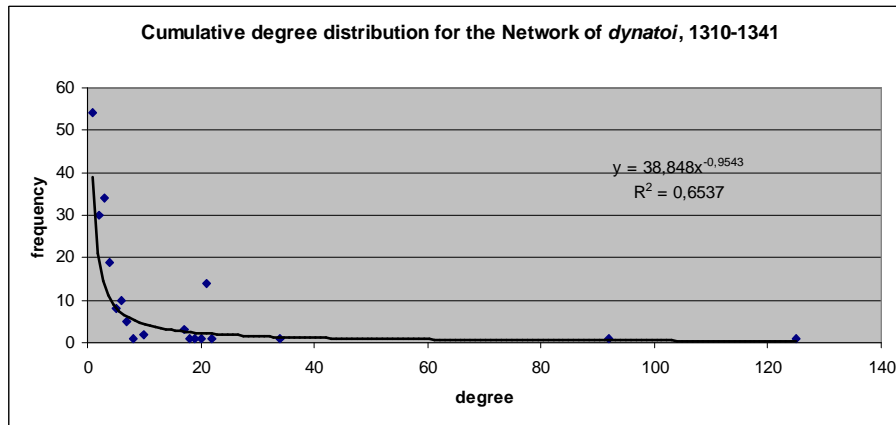


Fig. 24: Cumulative distribution of "points of nobility" among noble families in Byzantium, 976–1204 AD (data from: KAZHDAN – RONCHEY, L'aristocrazia 239–246)

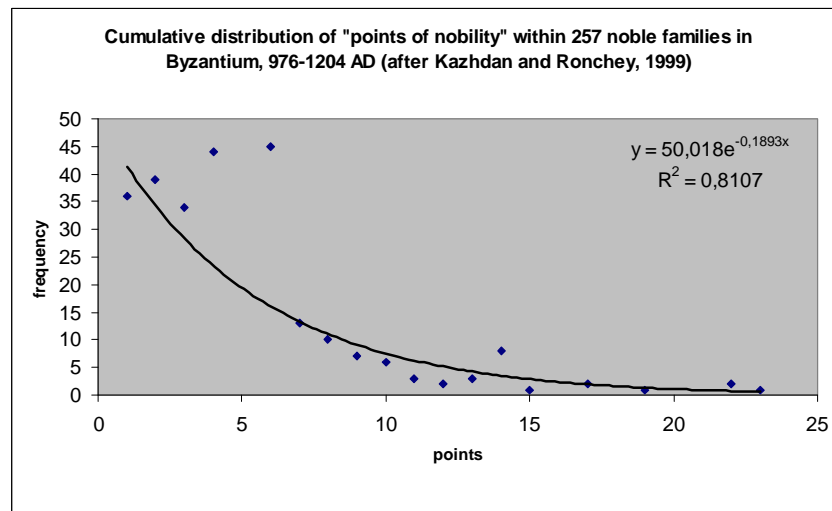


Fig. 25: Visualisation of the network of the *dynatoi* (the powerful), 1310-1341 (n = 186), without Emperor Andronikos II Palaiologos

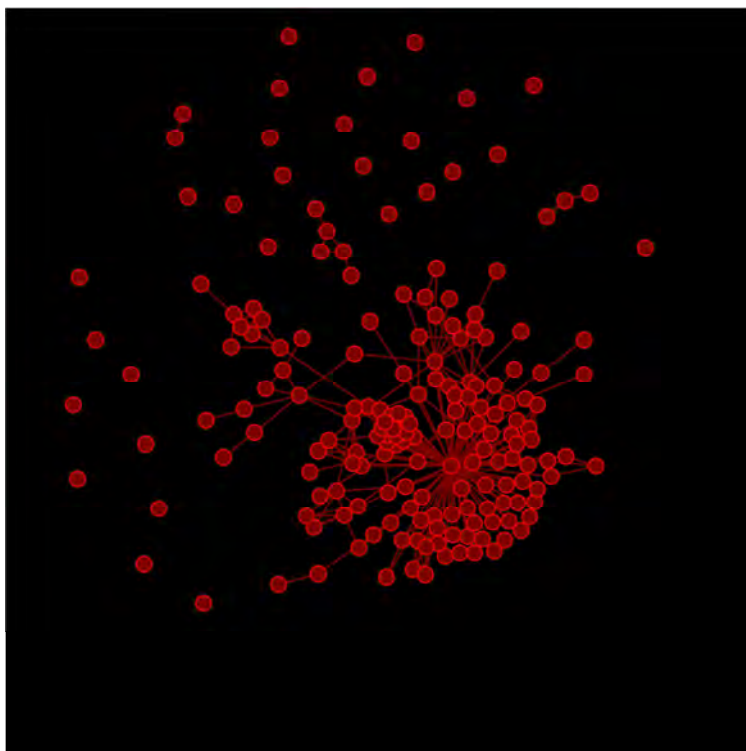


Fig. 26: Visualisation of the network of the *dynatoi* (the powerful), 1310-1341 (n = 186), without Emperor Andronikos II Palaiologos and Emperor Andronikos III Palaiologos

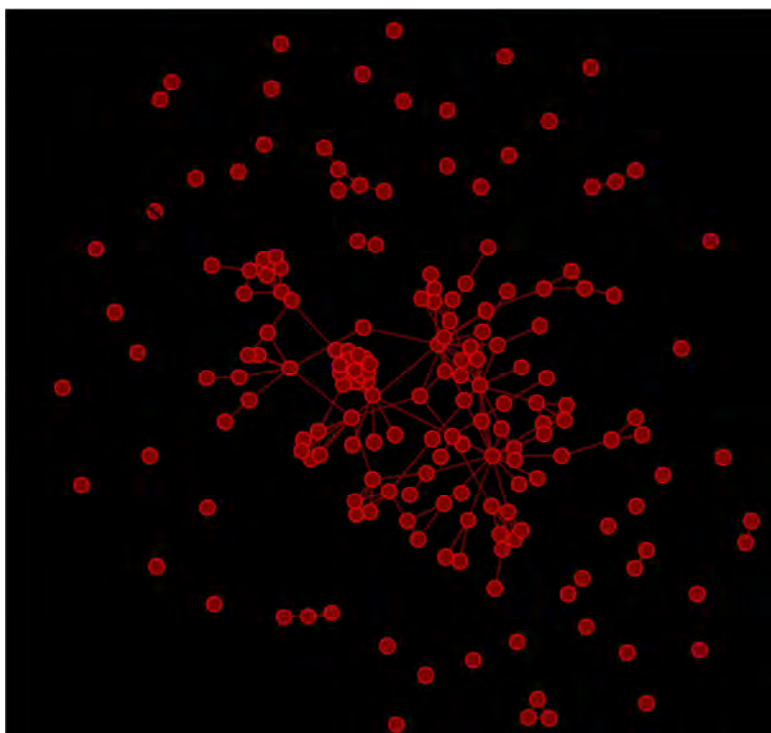


Fig. 27 a and b: Development of central network analytical measurements of the network of the *dynatoi* (the powerful), without Emperor Andronikos II Palaiologos and without Emperor Andronikos II Palaiologos and Andronikos III Palaiologos

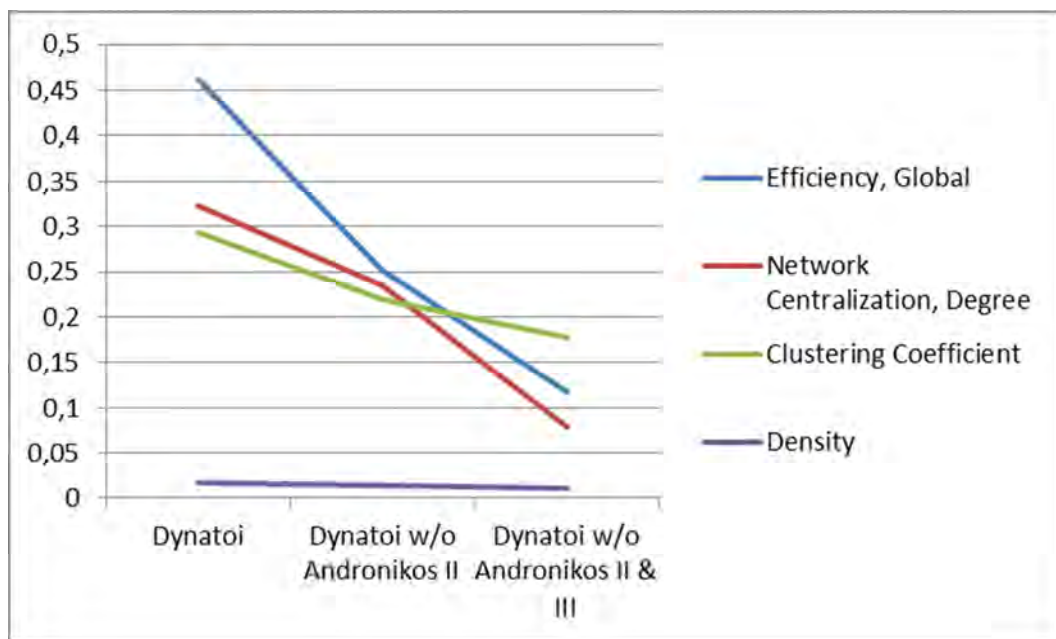
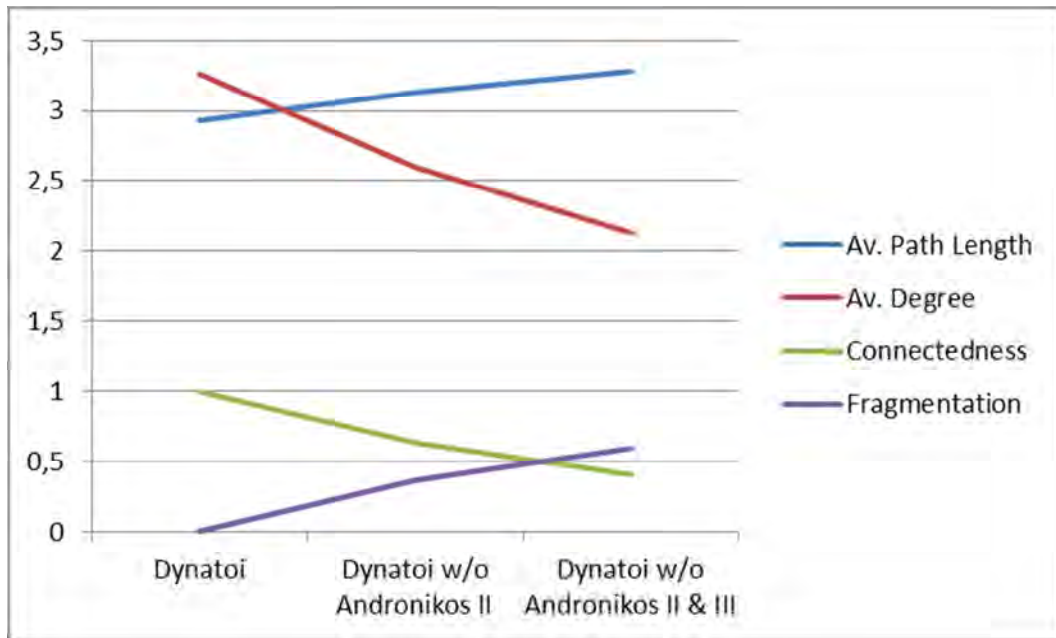


Fig. 28: Visualisation of network of the Ecumenical Patriarch, the metropolitans, archbishops and suffragan bishops in the first half of the 14th century (n = 698)

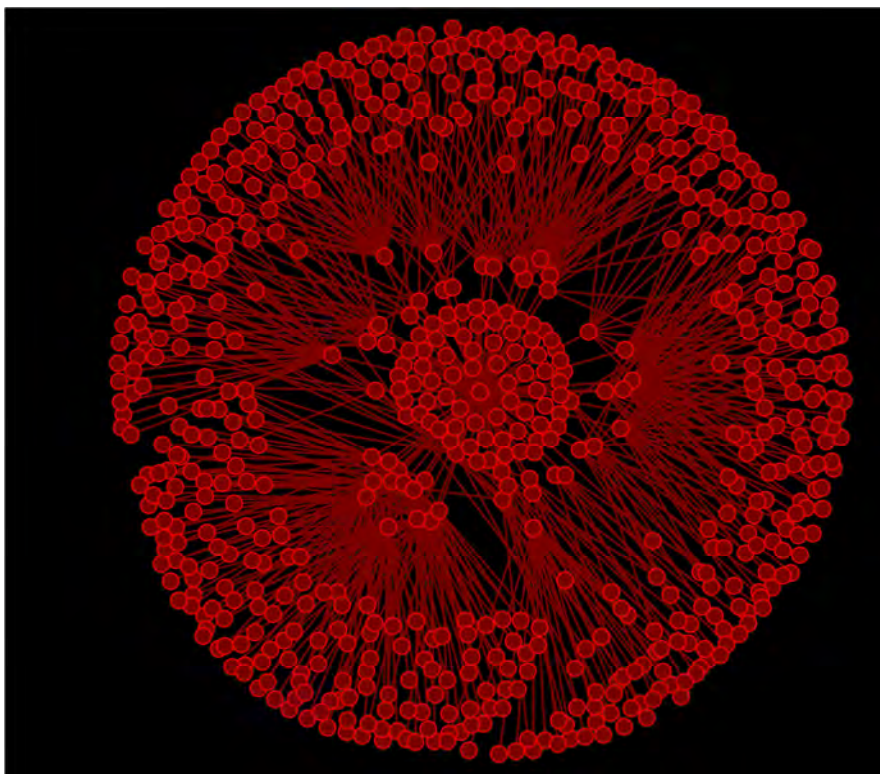


Fig. 29: Visualisation of network of the metropolitans, archbishops and suffragan bishops in the first half of the 14th century (n = 698) without the Ecumenical Patriarch

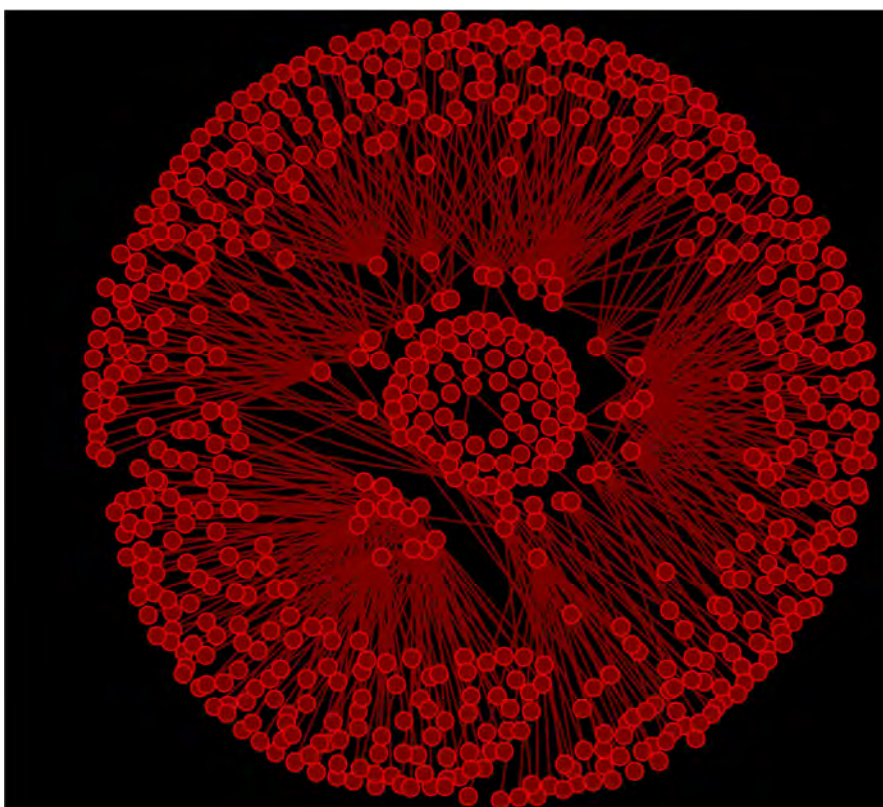


Fig. 30 a and b: Development of central network analytical measurements of the network of the hierarchs without the Ecumenical Patriarch

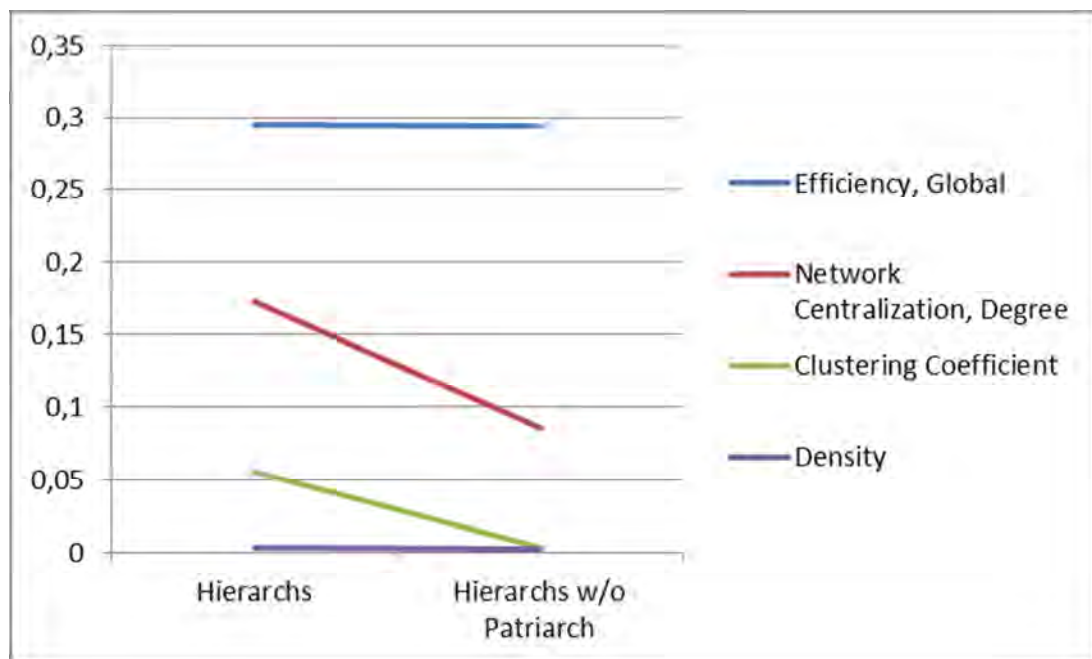
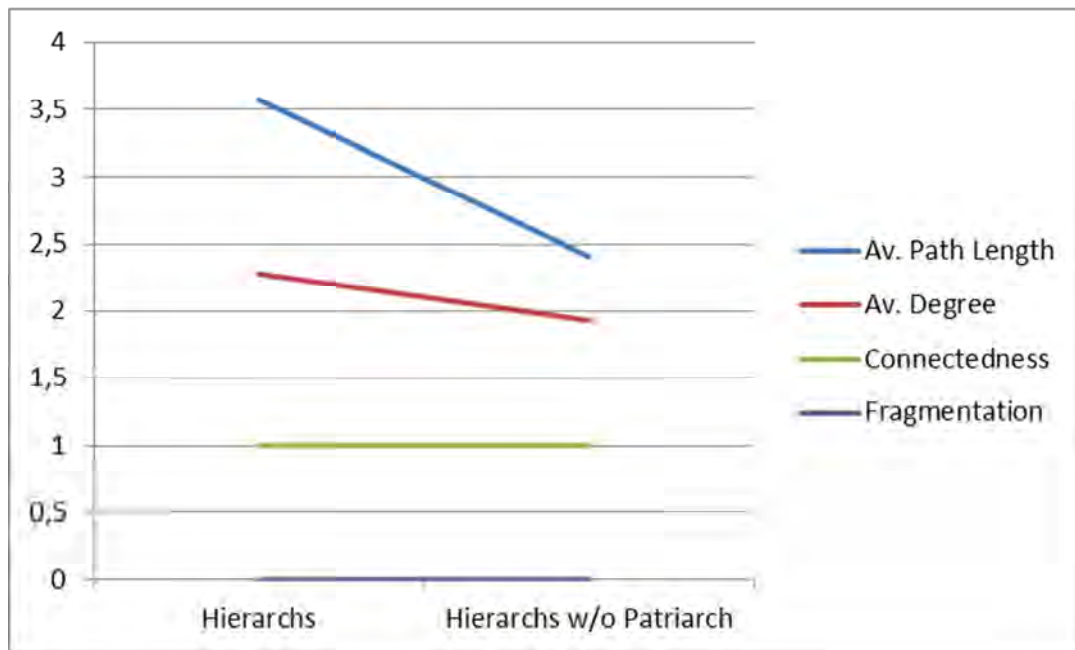
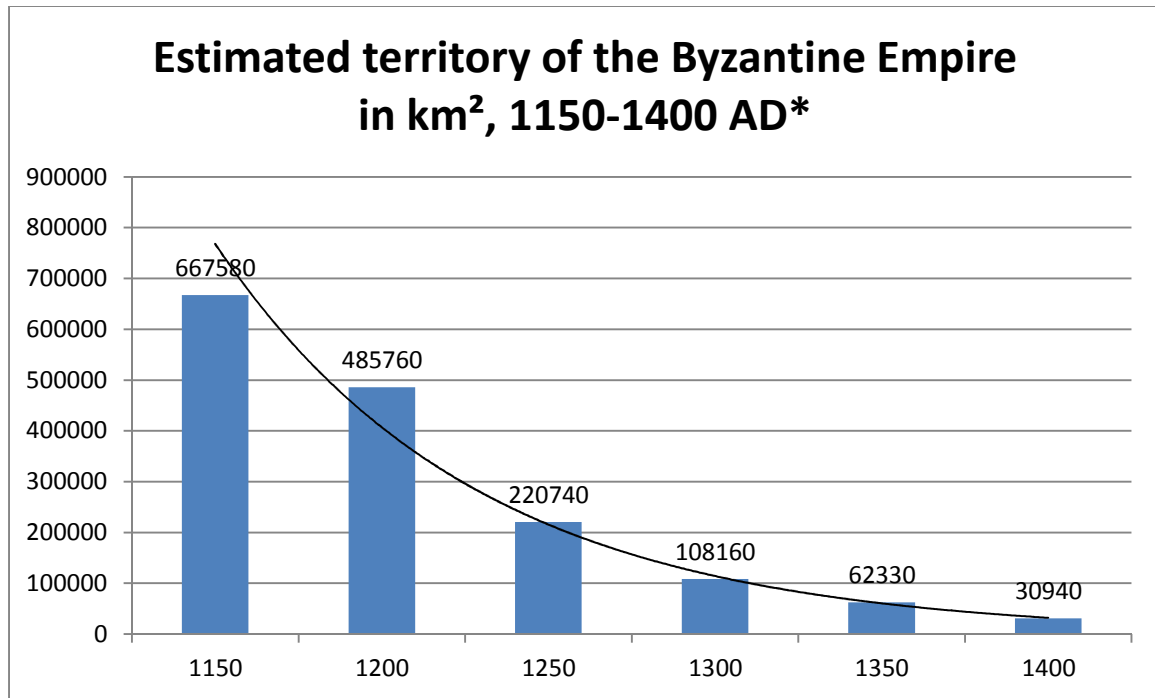


Fig. 31: Estimated territory of the Byzantine Empire in km², 1150–1400 AD



* Own calculation on basis of the surface data given for the provinces of Late Antiquity in: J. KODER, The Urban Character of the Early Byzantine Empire. Some Reflections on a Settlement Geographical Approach to the Topic', in: The 17th International Byzantine Congress. Major Papers. New Rochelle, N.Y., 1986, 155–187.

Fig. 32: Comparison of the number of bishoprics listed in Notitia 13 (12th century) with the number of those bishoprics which are also listed in Notitia 21 (second half of the 15th century)

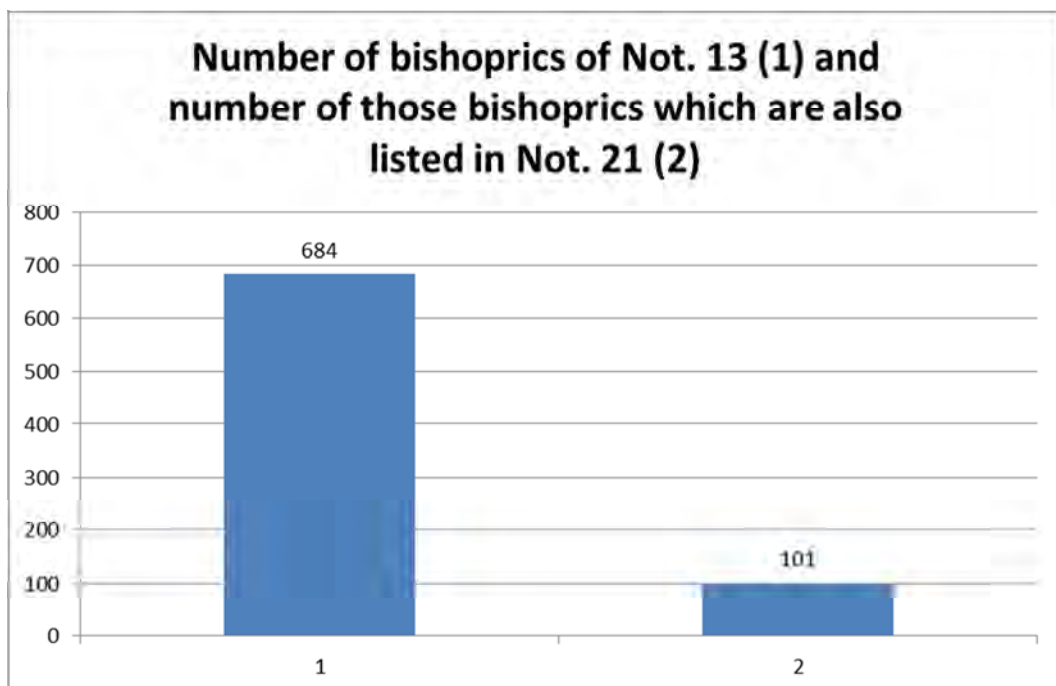


Fig. 33 a and b: Closer comparison of the number of bishoprics listed in Notitia 13 (12th century) with the number of those bishoprics which are also listed in Notitia 21 (second half of the 15th century)

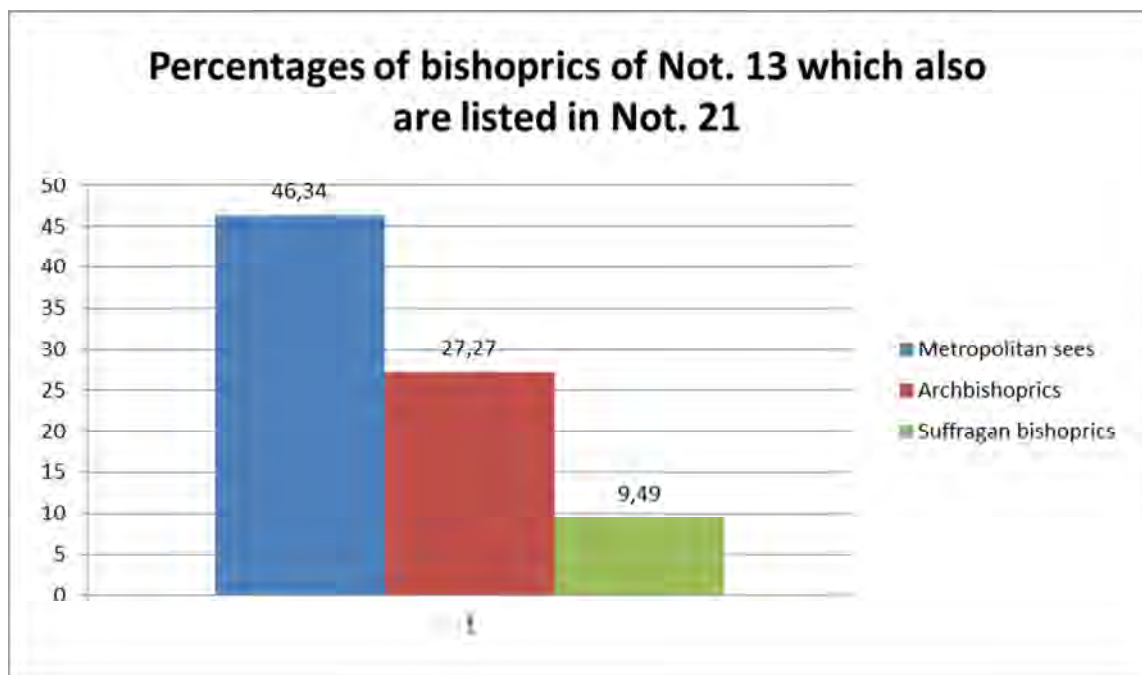
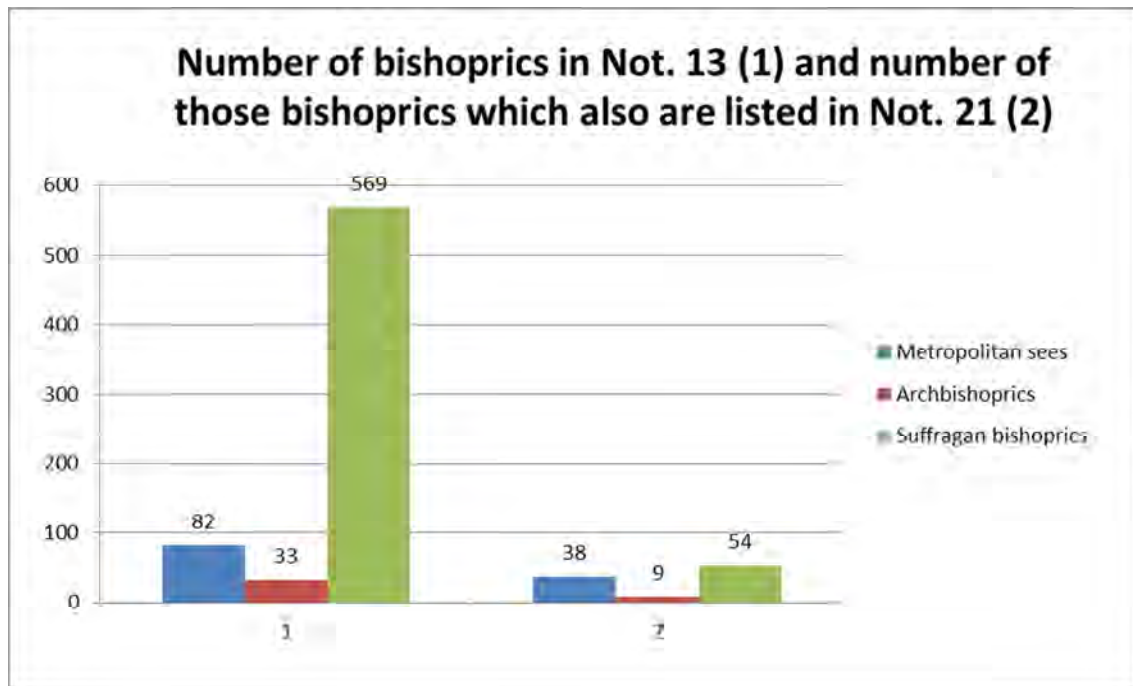


Fig. 34a: Market Price of Venetian Government Bonds (as percentage of par value), 1285-1399 (after KEDAR, *Merchants in Crisis* 139-141)

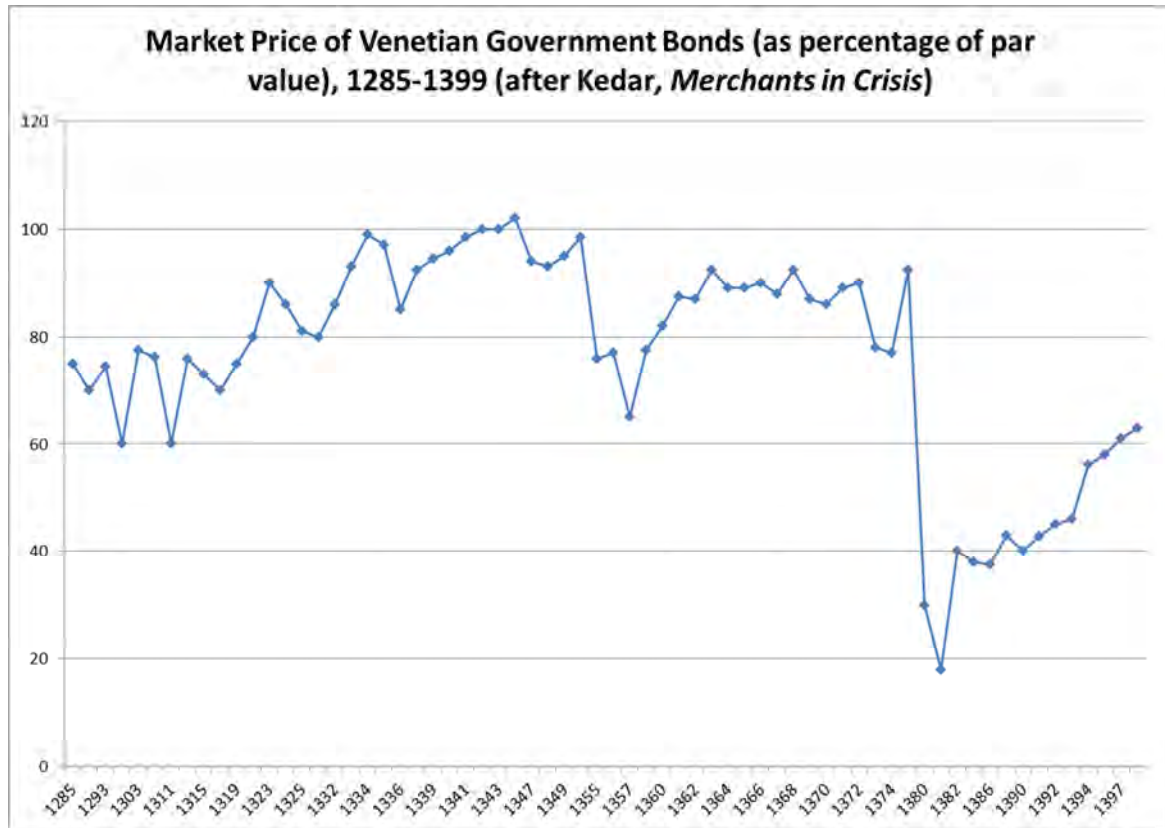


Fig. 34b: Attractor of the trajectory of the market price of Venetian Government bonds, 1285-1399



Fig. 35: Comparative scale of the imperial revenues of Byzantium in the 14th century

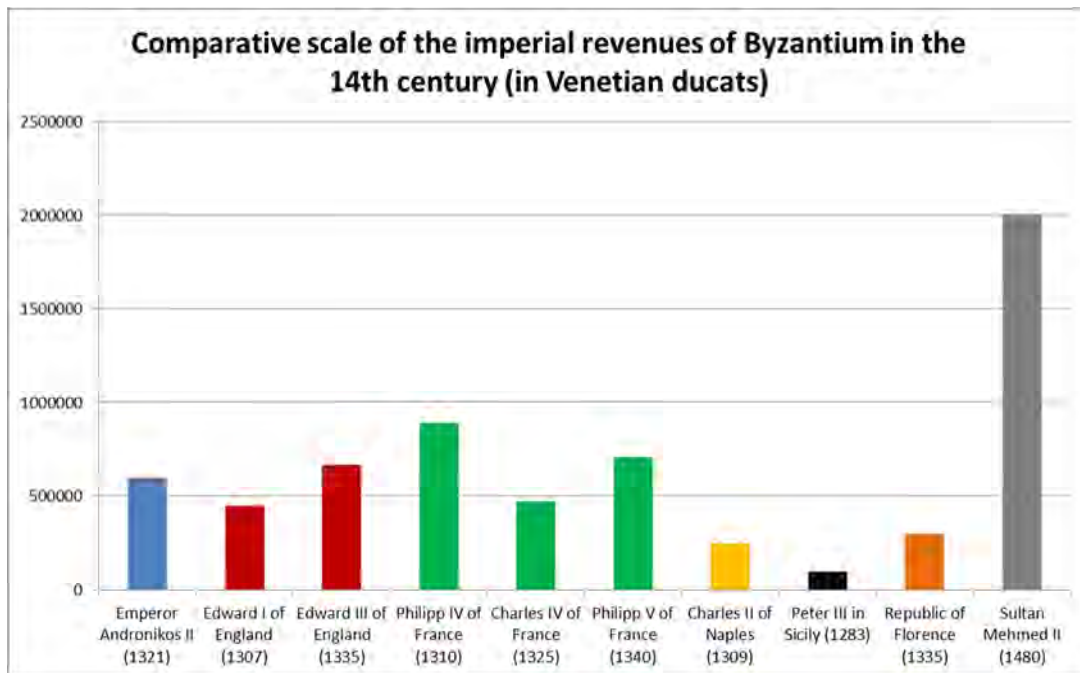


Fig. 36: Comparative scale of the commercial activity of the Genoese and Venetians in the "Romania"

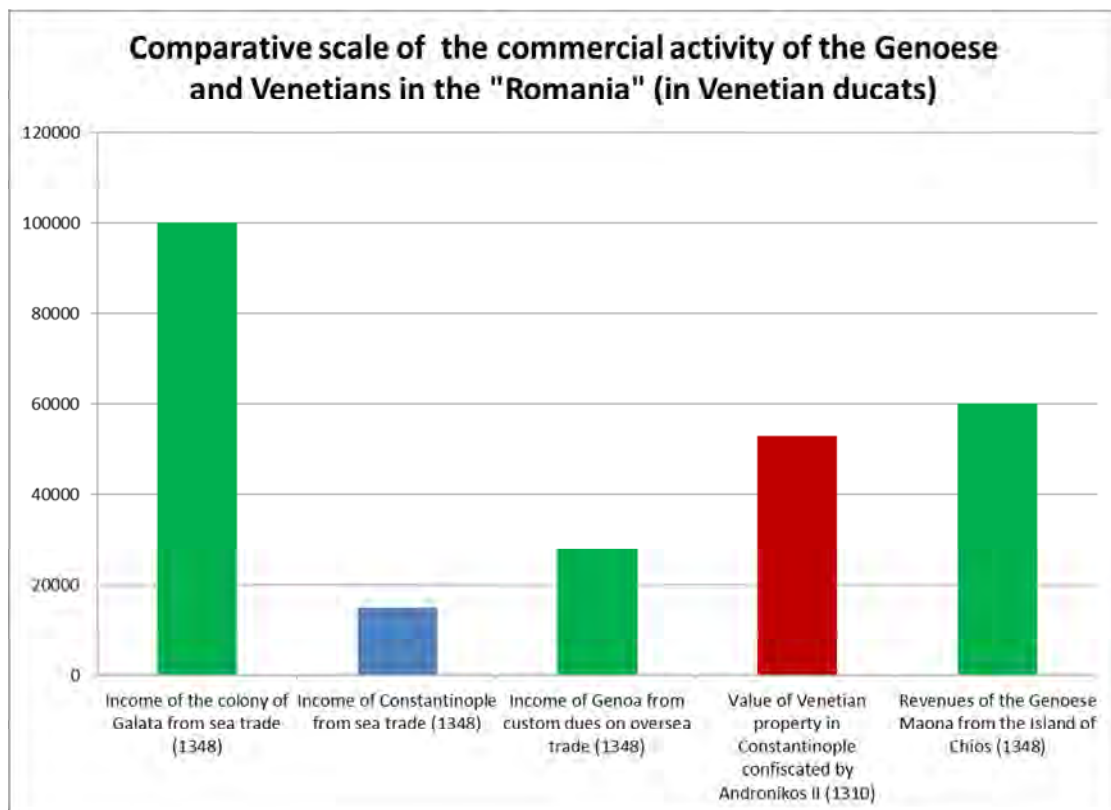


Fig. 37: Comparative scale of aristocratic and ecclesiastic wealth in Byzantium and in Western Europe in the 14th century

