

Stagnation and Change in Islamic History

by

Metin Coşgel

Economics Dept.
Unit 1063, 341 Mansfield Rd.
The University of Connecticut
Storrs, CT 06269-1063
Tel: (860)486-4662
Email: Metin.Cosgel@UConn.Edu
Web: www.cosgel.uconn.edu
www.ottoman.uconn.edu

Preliminary Draft for Presentation at the Conference:
“Law and Economic Development: a Historical Perspective”
Utrecht, Utrecht University

Sept. 20-22, 2007

COMMENTS WELCOME

Stagnation and Change in Islamic History

Metin Coşgel

Islamic societies have been characterized as being historically conservative against modern ideas, technological advancements, and legal developments. Various types of evidence have been identified as supporting this view. Modern developments in physics, chemistry, and other natural sciences, for example, were not introduced into the curriculum into the Ottoman Engineering School until the nineteenth century. Similarly, the printing press was not officially accepted until the eighteenth century, almost three centuries after the invention of the moveable type was known in the Islamic World. It also took a long time for some of the fundamental organizational developments, such as the concept of a corporation, to be recognized by the legal system.¹ As a result, the Islamic World missed out or enjoyed only with significant delay the benefits of various scientific, technological, and legal developments that other parts of the World realized in the form of long term economic growth and higher standards of living.

The problem with the view of Islamic societies as being guarded against economic change is that it is difficult to generalize it for all times, places, and types of new developments. The story of economic change in the Islamic World has a brighter side. While some schools did not teach modern natural sciences, others did. Earlier in history, such as during the ninth and tenth centuries, Muslims were at the forefront of

¹ For details and other examples, see Güçek (1987), Huff (2003), İhsanoğlu (2004), Kuran (2005), and Robinson (1993).

scholarly, scientific and technological developments. Similarly, the law was vibrant, changing as necessary to facilitate production and exchange throughout the fast growing Islamic World. Examples of openness and innovativeness can be found not just in distant history but more recently in modern societies, as can be seen in the quick adoption of new technologies, the founding of modern public and private educational institutions, and the development of areas of fast economic growth.²

There appear to be two seemingly contradictory images of economic change in the Islamic World, creating a fundamental difficulty in the literature in developing a satisfactory framework to understand the problem in its entirety. Writers have often focused on either stagnation or change as being more representative and needing an explanation, rarely looking to explain why both images were observed. Those considering stagnation as the more representative and problematic image have typically attributed it to a fixed characteristic of Islamic societies, such as traditionalism or religious conservatism.³ Others considering change as the more representative image, on the other hand, have similarly focused on characteristics like pragmatism and flexibility for explanation, painting a rosier picture of the past as well as the potential for the future.⁴ Although there have been writers trying to resolve the contradiction between the two images, their attempt has typically been in the form of identifying an intrinsic quality, such as usefulness or religious compatibility, of a new scientific, technological, or legal development, to be able to differentiate between those that were accepted and others that were rejected and to make sense of how observed images varied across time

² For examples of openness to change, see Clarence-Smith (2006), Hassan and Hill (1986), Huff (2003), Iqbal (2002), and İhsanoğlu (2004).

³ See, for example, Jones (1987: Chapter 9), Landes (1969: 28-30), Lewis (1982).

⁴ For example, Hassan and Hill (1986), Iqbal (2002), İhsanoğlu (2004), and Pamuk (2004).

and space. By typically relying on ad hoc assumptions about how the attitudes and characteristics of societies or the inherent qualities of new developments have changed over time and across societies, these attempts have also failed to account for the variation in economic change.

What is needed is a framework that can account for the observed complexity as a whole, one that is simple yet flexible enough to explain stagnation and change in Islamic history comprehensively. For a simplified approach to the problem, this article will study it in the context of the relationship between the rulers and the legal community. The legal community has been an influential group in Islamic societies because of their power in the interpretation and adjudication of the law. The rulers have often called upon the legal community to issue opinions on the “legality” of new developments, jointly shaping the society’s decision on how to respond to new scientific, technological, and legal developments. To study the strategic interaction between the rulers and the legal community, I will adopt a political economy approach to Islamic history and use insights from recent studies of institutional change (Greif, 2006; Coşgel, Ahmed, and Miceli, 2007; Kuran, 2004). Such an approach will allow an explanation of change or stagnation not as the outcome of a fixed characteristic of Islamic societies or an intrinsic quality of a new development, but in terms of how it would affect the ruler’s relationship with the legal community.

More specifically, I have three objectives. The first is to extend Greif’s (2006) recent theory of endogenous institutional change to develop an explanation of economic change based on how rulers and legal community reacted to new developments immediately and how their strategic interaction unleashed an endogenous process toward change in the

long run. The second objective is to identify conditions under which new ideas, technologies, and legal developments have resulted in immediate change in Islamic societies. When a new development and its impact was recognized and the cost of change was low, the rulers and the legal community could react immediately in such a way to accept it jointly. Depending on how each development affected the interests of the ruler and the legal community, some new developments could result in immediate institutional refinements, while others could be ignored. The proposed explanation of economic change helps to identify different types of reasons for refusal or acceptance. The third objective is to examine the process of change in the long run, whether and how immediate outcomes could be sustained over time as strategic interaction continued repeatedly. The reactions of the rulers or the legal community and the cooperation between them could be altered over time as a result of external developments and endogenous processes. While some developments could be rejected at first, they could eventually be accepted if there was an endogenous process undermining the initial choice. The cooperation between the ruler and the legal community could also be subject to change. Although cooperation generally could remain a viable and reinforced institution, there could also be processes undermining the relationship and causing episodes of confrontation that required refinements or even reforms to reset the parameters of the cooperation to be able to deal with these developments.

STAGNATION AND CHANGE IN ISLAMIC HISTORY

The evidence appears mixed on whether the typical response to the introduction of new developments in science, technology, and law has been refusal or acceptance. In

some instances, accepting change took a long time or never happened. Some of the refusals to adopt new developments have attracted significant attention. It is well-known, for example, that despite a high demand for books, a clear awareness of the new printing technology, and a successful reproduction of it within Ottoman lands by religious minorities, Ottoman rulers and legal community did not officially sanction printing in Arabic characters until the eighteenth century and did so only for non-religious books.⁵ There were similar delays in the adoption of other new technologies like the mechanical clocks and various modern scientific developments in medicine, astronomy, geography, and other natural sciences (Huff, 2003). Human dissection was forbidden in the teaching of medicine, some of the great centers of astronomic research at observatories were closed, and modern educational institutions for the study of natural sciences were not established until the nineteenth and twentieth centuries.

Change did not come fast in adopting some of the new legal developments and forms of business organization either. As Kuran (2004: 71) has recently argued, “in certain areas central to economic modernization change was minimal...In eighteenth-century Cairo, credit practices hardly differed from those of the tenth century. Likewise, investors and traders were using enterprise forms essentially identical to those prevalent eight centuries earlier.” As late as the nineteenth century, some of the significant components of the institutional endowment of the Islamic World inhibiting the private accumulation of capital had not been removed. The laws of inheritance had not changed,

⁵ For different perspectives on the adoption of printing press in the Islamic World, see Eisenstein (1979), Güçek (1987), Robinson (1993), and Savage-Smith (2003).

the concept of corporation as a distinct legal entity had not been recognized, and rigidities in the private provision of public goods through the waqf system had not been removed.⁶

The image of a conservative attitude towards new scientific, technological, and legal developments in early modern period, however, seems to contradict with openness shown in other areas during the same period. Military technology, for example, remained a vital and fast changing backbone of Islamic states during this period, so much that it has earned them the title “gunpowder empires” (Hodgson, 1974). There were also Taqi al Din’s well-known advances in astronomy in Istanbul observatory and various educational institutions established by the Ottomans for scientific education in applied medicine, astronomy, and mathematics (İhsanoğlu, 2004). Noting the importance of changes made to the madrasa system in the fifteenth century, İhsanoğlu (2004: 16) has argued that with these changes “the Islamic world experienced an unprecedented wave of scientific progress.”

The image of a conservative attitude does not seem applicable to other times, places, and sectors of Islamic history either. This image appears to contrast sharply, for example, with the evidence available on these activities in earlier periods. Though slow to adopt the printing press in the fifteenth century, Muslims were previously very quick to adopt the paper, a Chinese invention of comparable magnitude to the printing press in the history of communications technology. They similarly appropriated the bulk of Greek science and philosophy during the eighth and ninth centuries. Noting these accomplishments, Huff (2003: 325) has argued: “Arab-Islamic culture and civilization

⁶ Gibb and Bowen (1957: volume 1, part II: chapters X and XII), Huff (2003: chapters 4 and 6), Kuran (2004), and Schacht (1970).

had the most advanced science to be found in the world prior to the thirteenth and fourteenth centuries. In optics, astronomy, the mathematical disciplines of geometry and trigonometry, and medicine, its accomplishments outshone those of the West as well as China.⁷

There is also evidence that suggests that Islamic societies were quick to revise the legal system and make institutional changes as necessary. This is particularly evident in the Ottoman public sector, for example in their tax codes and bureaucratic organizations. An urgent task of the Ottomans following the conquest of new land was to draft the tax code, which they immediately performed based on preconquest rules and policies but sometimes also with significant changes as necessary (Coşgel, 2004, 2005). Numerous innovations similarly took place in methods of tax collection, the government switching from the use of cavalymen or salaried officials to private citizens or even lifelong agency relationships in the collection of taxes (Coşgel and Miceli, 2006). The structure of Ottoman bureaucracy and provincial administration, including systems of appointment and remuneration, also changed as necessary (Findlay, 1980). Reviewing institutional change in the Ottoman Empire, Pamuk (2004) has argued that, contrary to the image of the Empire depicted as rigid and unchanging, it was in fact flexible and pragmatic, willing and able to adapt to changing circumstances as necessary.

The image of a general conservative attitude also contrasts sharply with some of the developments that have taken place in the Islamic World more recently. Muslim societies have been very quick to adopt advancements in digital, optical, or transportation technologies in the late twentieth and early twenty first centuries. They have similarly

⁷ See also Clarence-Smith (2006), Goldstone, (1987: 130), Hassan and Hill (1986), Hogendijh and Sabro (2003), Iqbal (2002), and Mokyr (1990: 34-35).

been at the forefront of introducing some of the novel economic institutions and organizational innovations such as the OPEC in the Middle East and microfinancing in Bangladesh, each with significant impacts on economic development and living standards around the World. There are several examples of creativity among the elements of the recent movement called Islamic Economics. The systems of borrowing and lending called Islamic banking based on different interpretations of interest, for example, can now be found in not just the Islamic World but also among the portfolio of services offered by some of the World's largest financial organizations. A similar innovation is the extension of *zakat* obligation from its traditional base of individuals to a system that now includes the earnings of firms, bank deposits, and other assets.⁸ In part due to oil revenues, several Gulf states have achieved some of the highest rates of growth, and they have overseen some of the largest urban development projects taking place in the World (e.g., Dubai) in recent history. One could easily interpret these developments as evidence of innovativeness and fast change in the Islamic World.

Evidence thus appears mixed on whether conservatism or openness better describes the reactions against economic change in the Islamic World. Whereas some sectors and time periods have seen resistance to change, other episodes have seen change welcomed or adopted with some delay. Some changes were introduced quietly, more as institutional refinements than wholesale reforms; others were confrontational and had to be introduced by force or decree, such as the Tanzimat reforms of the Ottoman Empire in the nineteenth century or the Republican Revolution of the early twentieth century. Given the mix of evidence available on change and stagnation, a satisfactory explanation must account for the mixture as a whole, not just the failure to accept some of the

⁸ For a critical evaluation of these developments and Islamic economics in general, see Kuran (1995).

scientific, technological, and legal changes, but also the enthusiasm to accept some immediately and the concession to delay others.

STUDIES OF ECONOMIC CHANGE

A dominant tendency in the literature on economic change in Islamic history has been to focus on one side of the story and offer one sided explanations. Studies of economic change in the modern period, for example, have typically emphasized stagnation in ideas, technologies, and legal systems as the ordinary state of affairs during this period. Historians have singularly focused on such things as the omission of certain disciplines in scientific education, late adoption of printing or industrial technology, or the inability to implement new forms of business organization. Explanations of these phenomena have also been mostly one-sided, typically noting a fixed characteristic of Islamic societies, such as traditionalism or religious conservatism, or an inherent quality of new developments, such as their threat to religious beliefs, as being responsible for the failure to adopt change.⁹

Studies noting change and progress as being more ordinary during this period have also been one-sided, naturally going to the other extreme of attempting to show examples of areas in which significant developments were achieved. This is also true for studies of economic change during the ninth and tenth centuries, where the focus has been on the achievements of Muslim scholarship, science, and technology, without fully acknowledging or questioning why these achievements did not continue into the modern period. Explanations of success in change and progress have similarly identified a

⁹ See, for example, Coulson (1964), Genç (2000), İnalçık (1973: Ch. 18), Jones (1987: Ch. 9), Landes (1969: 28-30), Lewis (1982), and Schacht (1964).

common quality, such as being “reliable and useful”, of those areas in which Islamic societies were open to change.¹⁰

Although there have been studies acknowledging both stagnation and change, their focus has also typically been on one of these phenomena, offering explanations that work well for one side of the story but not necessarily the other. For example, Goldstone’s (1987) study of the disappearance of Ottoman innovativeness after the fifteenth century, Huff’s (2003) explanation of the failure of Islamic science and technology to continue in leadership after the fourteenth century, and Kuran’s (2004) study of the stagnation of the legal infrastructure of the Islamic Middle East by the nineteenth century share focus on stagnation as the more problematic side of the story that needs explanation. It is also typical among this type of studies to identify an intrinsic quality of modern science, technology, or legal systems that does not fit well with a fixed characteristic of Islamic societies.

There have been four general types of problems with previous explanations of stagnation and change in Islamic history. The first is that the methodology of choosing a fixed characteristic of Islamic societies and explaining change by determining whether there was a match with a given quality of a new item often proceeds by making ad hoc assumptions about these characteristics or qualities. While this procedure explains too easily some cases of perfect fit, such as between pragmatism and pragmatic items, it fails to explain anomalous cases of misfit, such as the between prohibiting the consumption but taxing the production of wine and pork and between religiousity and the refusal to print religious texts. The general strategy of attributing stagnation or change to social, religious, or moral attitudes is particularly problematic because they are not directly

¹⁰ For example, İhsanoglu (2004), Hassan and Hill (1986), and Clarence-Smith (2006).

observable and invite ad hoc explanations. A related problem is that the mechanisms behind social attitudes or characteristics are not specified. Even though a certain characteristic like traditionalism might provide an accurate description of a society at a certain point in time, identifying this description goes only so far. It only explains how economic change or stagnation may have happened, but not why. It does not explain, for example, what were the reasons behind this characteristic, whose preferences, motives, and interests were involved, and what was the mechanism that transformed these into social outcomes. We need to know the microfoundations for the social characteristics or attitudes observed in the aggregate. The third problem is to view change as a single event, rather than a possibly long process. When a refusal to adopt a new development instantaneously is viewed simply as a failure to accept change, then various endogenous processes that the new development may have generated may be ignored, processes that might eventually cause change. Such an approach fails to explain why sometimes change takes longer than others. A fourth type of problem with previous studies is their difficulty in explaining shifts over time or differences across societies and sectors. Various reversals of trend have been observed in history, such as the initial rejection of the printing press and its eventual acceptance, or the initial leadership in astronomy and eventual stagnation a few centuries later. These kinds of reversals are usually explained by attributing them to a gradual transformation in a society's characteristics, such as westernization or modernization, but without providing a satisfactory explanation for why this transformation occurred. It is not clear, for example, why different developments are adopted at different times and whether the underlying process of transformation was endogenous. For a more satisfactory explanation of economic change

and stagnation, we need to avoid ad hoc assumptions about the characteristics of societies or the intrinsic qualities of new developments, probe deeper into the micro foundations for the observed macrobehaviors, view change as a process, and identify the endogenous mechanisms underlying this process.¹¹

STABILITY AND CHANGE IN INSTITUTIONS

The difficulties faced by explanations of economic change in Islamic history are analogous to those faced by recent theories of institutional change in general. Greif (2006) has recently grouped these theories into two general categories. There is, on the one hand, the game theoretic approach, in which institutions emerge as endogenously generated equilibria. The challenge this type of an approach faces has been the difficulty of explaining endogenous change (Hall and Taylor, 1996; Greif, 2006). The only way change makes sense in this type of framework is if it has origins in parameters exogenous to the institution under consideration. The other general approach to institutional change is historical institutionalism, which focuses on process instead of equilibria and studies change through positive and negative feedback loops. Change is the result of a process in which negative loops keep undermining the institution and caused the creation of a new institution. Contrary to game theoretic approach that cannot explain change, historical institutionalist approach suffers from the opposite problem of overpredicting change and explaining it too easily (Greif, 2006).

Bridging the divide between the game-theoretic and historical institutionalist approaches, Greif (2006) has proposed a new theory of endogenous institutional change.

¹¹ For examples of other commentaries of the relevant literature, see Clarence-Smith (2006), Goldstone, (1987), Hallaq (1997), Huff (2003: 53-5), Humphreys (1991), İhsanoğlu (2004), and Iqbal (2002).

His theory builds on repeated game theory. Introducing the concepts of “quasi-parameters” and “self-reinforcement,” he studies why and how institutions change or remain stable in a changing environment and the processes that ensure their survival or lead to their eventual demise. Changes in quasi-parameters do not necessarily lead to a change in the behavior associated with an institution immediately but may do so in the long run by setting off an endogenous process that either reinforces or undermines it. An institution is self-reinforcing when it increases the range of situations in which individuals find it in their best interest to adhere to the behavior expected of them. Conversely, it is self-undermining if the process reduces this range. Institutional change would take place at the critical point when the range shrinks so much that the associated behavior is no longer self-enforcing. In addition to developing these concepts theoretically, Greif (2006) has also applied them empirically to paired comparison of institutional change, namely the comparisons of political regimes in Venice and Genoa and cleavage structures in Nigeria and Estonia.

Greif’s approach is useful in studying institutional change in Islamic history. The institution of primary interest here is the shared expectation of mutual cooperation between the ruler and the legal community in shaping the society’s reaction towards change. The legal community has been an influential group in Islamic societies because of its power over the ordinary people and its relationship with the rulers and other influential groups (Coşgel, Ahmed, and Miceli, 2007). The community has historically consisted of individuals trained in the Islamic Law, serving primarily as teachers (*mudarris*) educating the Muslim community, as judges (*qādī*) resolving legal disputes, or as jurisconsults (*muftī*) offering legal opinions. Although there have been various

other influential groups in Islamic history, such as the janissaries or religious minorities, the legal community has been in a unique position in the distribution of power because of its dual responsibilities of providing public goods and services, such as the clarification of property rights and the issuance of legal opinions, for the ordinary people and also acting as the counsellor and regulator for the decisions of the ruler.¹²

To see the nature of the cooperation between the rulers and legal communities in shaping new developments, consider first the potential for a conflict between their interests. Once a new scientific idea, technological innovation, or legal development was introduced, the legal community's function was to issue an opinion on whether to permit or ban it. The rulers had the choice between giving credibility to these opinions by authorizing them in a cooperative relationship with the legal community and ignoring or even prohibiting these opinions in a confrontational relationship. The ruler's choice was thus whether to enter into a cooperative relationship with the legal community, and the legal community's task in this relationship was to choose among available options, including even those that may not have been in the best interest of the ruler. Although it could sometimes be in the best interest of the legal community to choose the option preferred by the ruler, at other times their own interests could dictate other choices. Their strategic interaction, most likely in repeated settings, would determine the outcome.

Many of the new developments in ideas, technology, and jurisprudence could affect the interests of the ruler, the legal community, or both. At any point in time the current configuration of these elements provided the rulers and the legal community direct benefits in the form of tax revenues or remuneration, or indirect benefits from power and

¹² For legal communities in different periods of Islamic history, see Coşgel, Ahmed, and Miceli (2007), Crone and Hinds (1986), Esposito (1999), Ghazzal (2005), Hallaq (2005), Heyd (1961), Imber (1997), Vikør (2005), Zaman (2002), Zilfi (2006), and Zubaida (2003).

status. New developments could affect the self-enforceability of the previous system significantly and alter the set of available benefits. New ideas could change the source and distribution of power in the society; new technologies could reduce the ruler's returns from production and tax revenue or the legal community's remuneration from services or private contributions; and new legal developments could constrain the ruler's coercive powers to tax or spend or the legal community's ability to constrain the ruler or claim a share of the public revenues. Ideas, technologies, and the legal system were thus essential institutional elements determining the returns the rulers and the legal community could receive from their strategic interaction with each other. Any exogenous or endogenous changes in these elements were likely to change their returns, possibly resulting in new outcomes for the society as a whole.

The reaction to these changes could be immediate or gradual, depending on uncertainty about them and the cost of change. Numerous outcomes could be observed, depending on the source of change, direction of its benefits, knowledge about available alternatives, and transition costs. Consider, for example, the simple hypothetical case of a clearly noticed new development that was obviously beneficial to both the ruler and the legal community. In that case, if the cost of change was negligible, one would expect the legal community to accept the change immediately and for the new development to be implemented without delay or controversy. Change in this case could be in the form of a refinement in one of the institutional elements, with no consequences for the expectation of mutual cooperation.

The situation would be more complicated at the other extreme if the new development went unnoticed, its impact was not well understood, change was costly, or

its benefits were distributed conflictingly between the ruler and the legal community.

Very little may be known, for example, about the impact of a new external technology, or it may be expected to affect one of the parties positively but the other negatively. In such cases, the immediate outcome of the strategic interaction between the rulers and the legal community could be to ignore or reject the new development and maintain the status quo in the short run.¹³

Change could come later as a result of the repeated interactions of the rulers and the legal community if the new development unleashed an endogenous process that undermined the stability of existing choices. Two types of change could be observed in the long run, depending on whether the final outcome came as a result of institutional refinement or wholesale reform. One possibility would be a delayed acceptance of change at a later point in time, as the benefits of a new development were better understood and cost of change went down. If, for example, the new development brought positive benefits to both parties but they failed to recognize these benefits immediately, it could be an easy matter for them to accept change eventually as benefits were better understood. Even when change was initially denied because one of the parties expected to lose from the new development, they could eventually find the new technology more attractive as the benefits of existing situation eroded because of an undermining influence. The adjustment in this case could be made by a refinement of one of the institutional elements, say a new technology or legal development, keeping the institution of cooperation intact. Institutional trajectory could follow the past.

¹³ See Greif (2006) for a detailed discussion of how various problems of knowledge, attention, and coordination may cause individuals to follow past behavior despite changes in their exogenous environment. As another possibility not examined here, even if both parties may expect to benefit positively from change, there may be other parties, such as the military, that need to be convinced or coerced into accepting the change at some cost, which may also deter accepting the new developments.

Another possibility is when wholesale reforms were necessary to implement change, ending the expectation of mutual cooperation. The new development and increasing recognition of its existence or impact could create significant tension between the rulers and the legal community, for which minor refinements may not be sufficient. If, for example, the rulers continued to cooperate in the short run despite a loss of revenue caused by the legal community's refusal of a new development, they could at some point have to cease cooperation as the loss grew and the legal community was unwilling to switch. The process undermining their cooperation could be strong enough to cause a gradual divergence of interests and a need to resolve the conflict by an end to cooperation.

It may be informative to illustrate a simplified version of the argument with a formal game-theoretic example. Consider the following game in sequential form showing a simplified interaction between the rulers and the legal community. In this game, the ruler first decides whether to cooperate with the legal community or defect. If he decides to cooperate, then the legal community issues an opinion on whether to maintain an existing state of affairs, say in technology, or to choose a new development.

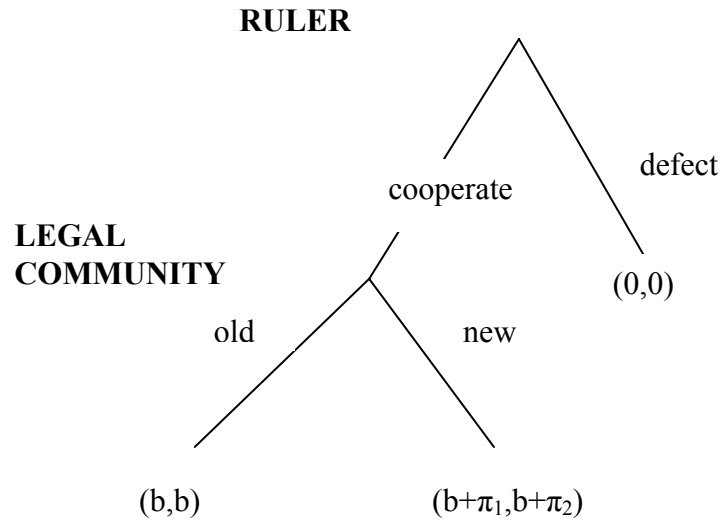


Figure 1

The first number in parentheses shows the ruler's payoff and the second the legal community's. The parameters are designed to show the possibility of asymmetric benefits from change and the resulting possibility of a one-sided prisoners' dilemma type of a situation. The parties receive a payoff of 0 from non-cooperation and positive benefits ($b > 0$) from cooperating under an old technology. Additional benefits of the new technology can vary, depending on the values of π_1 and π_2 .

Consider first the case of symmetric benefits ($\pi_1 = \pi_2$). It is easy to see that if both parties receive positive additional benefits from the new technology, the equilibrium is (cooperate, new). But (cooperate, old) is the equilibrium if the new technology is inferior for both.

But it is also possible for the additional benefits of the new technology to be asymmetric between the two parties. Several subcases are possible. One interesting

possibility is when $0 < b + \pi_1 < b$ and $\pi_2 > 0$. The equilibrium now becomes (cooperate, new) through what might be interpreted as an institutional refinement keeping the institution of cooperation intact. Although the ruler receives a lower payoff under the new technology, he is still better off than the alternative of defecting. Another possibility is when $\pi_1 > 0$ and $\pi_2 < 0$. The equilibrium remains (cooperate, old), even though the ruler could receive a higher payoff from the new technology.

Yet another interesting possibility is when $b + \pi_1 < 0$ and $\pi_2 > 0$, resulting in a game of one-sided Prisoner's Dilemma with properties similar to the well-known symmetric two-sided Prisoner's Dilemma games. Although the ruler would really prefer the (cooperate, old) outcome to anything else, he has to choose "defect" defensively, because the legal community's dominant strategy is to choose the new technology. This would result in an equilibrium of (defect, new). Cooperation cannot be sustained in a single play of this game. The legal community may want to commit to old technology, but they cannot credibly do so if the relationship is of limited duration.

Cooperation is possible, however, when the relationship is repeated. A well-known result of game theory is that an infinite number of repetitions allows cooperation to be realized in this type of situations, where reputation offers a way out of the problem. The notion of infinitely repeated interaction clearly applies to the long term relationship between the rulers and legal community. This may explain why despite numerous instances of potential conflict that could damage cooperation, the rulers and the legal community were for the most part able to maintain a cooperative relationship in Islamic history. In the long run, cooperation could continue and grow stronger if the endogenous

process was self-reinforcing. But it could also get weaker and even discontinue at some point if the process was undermining.¹⁴

IMMEDIATE REACTIONS TO NEW DEVELOPMENTS

The framework developed here can be used to analyze different types of reactions observed against new ideas, technologies, and legal developments in Islamic history. To keep the analysis simple, consider new developments as being exogenous, leaving aside the question of where they have come from. Consider also the immediate reactions to these developments first, leaving to the next section the possibility of long term change following initial reactions. Immediate reactions could be taken against new developments which have been easily recognized, whose impacts have been well-understood, and for which the cost of change was low. The framework developed above helps to distinguish carefully among these reactions. Going beyond simple categories of “accepted” or “rejected,” we can identify the mechanisms behind each reaction and further distinguish between them. Being accepted did not necessarily mean that the ruler and the legal community preferred a new development unanimously; neither did immediate rejection mean that both parties were against it.

When a new development was accepted, several cases could be possible. The most obvious case was when the development was expected to raise the welfare of both the ruler and the legal community, and the development was approved as an institutional refinement without adverse consequences for cooperation. Good examples of this type of

¹⁴ For a theory of endogenous change and examples of reinforcing and undermining processes, see Greif (2006).endogeneous proces

developments that found easy acceptance can be found in military technology, such as the invention of the gunpowder or new types of firearms or cannons, most of which were adopted by Islamic societies as quickly as possible. There was a similar interest in new developments in navigation and mining industries, novel consumption goods like eyeglasses, financial instruments that facilitated banking, and more efficient methods of taxation and tax collection. Both parties stood to gain from these developments, and the immediate reaction was generally positive.¹⁵

But it is also possible for a new development to be approved even though it was not beneficial to one of the parties. This could be the case, for example, if it was expected to raise the legal community's return compared to the status quo but reduce that of the ruler. The legal community could approve the new development, and the ruler could still continue cooperation despite worsening welfare as long as he expected to receive higher returns from cooperation than confrontation. Examples of this type of phenomena may be found in legal developments that transfer resources from the ruler to the legal community.

Perhaps the best example of an approved development despite the possibility of a welfare loss may be the system of charitable foundations known as the waqf (Kuran, 2001). The legal basis for this system was incorporated into the Islamic Law around the middle of the eighth century, also a period during which the legal community was being established and gaining power independently. The waqf was a successful legal instrument, spreading quickly in all successive Islamic societies and receiving immediate support from rulers and legal communities. This is a curious development because the

¹⁵ For more specific examples, see, Coşgel (2005), Clarence-Smith (2006); Güçek (1987), Huff (2003), İhsanoglu (2004), III; Mallat (1996).

rulers stood to lose tax revenues from the endowment of property as waqfs. Granting tax exemption to the earnings of property designated as waqf was a significant component of the system. Although the exemption facilitated endowments of property from wealthy individuals, it is not clear why the rulers would consent to the resulting reduction in tax revenue. True, the waqf system may have been an efficient mechanism as a whole for the delivery of public goods and services. But its benefits to the ruler may have been still negative or at least uncertain. The answer to the puzzle may lie in the benefits of the system to the legal community. Much of the financial support of the community, for items ranging from the education and remuneration of its members to the maintenance of the institutions and infrastructure supporting its activities, were provided by the waqfs. The legal community could thus prefer the waqf system immediately and enthusiastically because they benefited greatly from it. The rulers, on the other hand, indirectly agreed to it, despite losing tax revenues, to be able to maintain cooperation with the legal community by virtue of being better off under cooperation than confrontation. The waqf system was thus adopted as an institutional refinement, keeping intact the cooperation between the ruler and the legal community.

Our framework helps also to separate analytically the reasons for why a new development might be rejected. An obvious basis for rejecting something was if both the ruler and the legal community perceived it as a threat to their welfare. Any new development that had the potential to raise the powers of the general public or other influential groups relative to the ruler and the legal community probably fell under this category and faced an immediate refusal. The immediate reaction to scientific developments such as new theories of the universe that challenged the views or the status

of the ruler and the legal community, new technologies that made it easier for other groups to organize, and threatening legal developments such as those that gave women greater rights (in typically patrimonial empires with male-dominated legal communities), were usually negative. Labelling such developments as being “western” or “foreign,” the rulers and the legal community generally opposed them immediately, not necessarily because of religious or cultural concerns but because they threatened their own interests.

The immediate rejection of a new development did not always mean that both parties were opposed to it. Something could also be rejected because, for example, the legal community was against it, even though the ruler could have preferred it over the status quo. Perhaps the best example of this type of a development was the printing press. The ruler would have preferred the printing press because the faster and wider dissemination of knowledge would be expected to raise production, incomes, and thus the ruler’s tax revenue. But the legal community could lose in the process, because the advancement of knowledge among the general public could eventually break the legal community’s monopoly over knowledge and legal interpretation. Ibrahim Müteferrika, who secured the first official permission to establish the printing press in the Ottoman Empire, knew this well when he stated that this community, “who possess influence in this country, insistently did not give permission for this new invention.”¹⁶ The legal community considered the printing press threatening to their welfare, and it was banned in the Ottoman Empire soon after its invention.

The same could be said about the rejection of the legal concept of the corporation. Since the corporation could have increased investment, production, and tax revenues, the

¹⁶ Güçek (1987: 113). For the effect of printing press on religious authority in Christianity and Islam, see Eisenstein (1979) and Robinson (1993).

rulers could have preferred its recognition as a legal concept. There were, in fact, ad hoc corporate public bodies selectively recognized by the rulers because of their benefits in such things as efficient tax collection. But it was not in the best interest of the legal community to recognize the corporation as a general abstract concept, because doing so could have opened the door to the rise of groups with significant power rivalling their own. Their monopoly in the interpretation of legal texts, for example, rested on their authority as individuals with legal training, and recognizing the authority of an incorporated office or organization would have threatened their monopoly (Kuran, 2005). Granting corporate autonomy to classes of individuals could directly undermine their status and welfare, and they ruled it out.¹⁷ Even if the rulers could have preferred the corporation because of its potential for higher welfare and tax revenue, they went along with the legal community's opinion in declining to recognize the concept because they were better off cooperating with the legal community than breaking the corporation.

INSTITUTIONAL CHANGE IN THE LONG RUN

Immediate reaction to a new development need not determine the final outcome. True, some initial reactions became final, as was the case for the adoption of military technologies, until of course an even better technology would become available. But in other cases initial reactions were later reversed, because they could not be sustained in the long run as institutions continued to evolve and change endogenously. Sometimes, even an immediate reaction that had proved to be self-enforcing in the short run could at some point be reversed in repeated interaction if there was a process undermining its

¹⁷ For a systematic analysis of the reasons for the late adoption of the concept of a corporation, see Kuran (2005).

continuity in the long run. It is also important, therefore, to go beyond initial reactions and examine economic change in the long run.

Sometimes inaction against a new development could become the default negative reaction, not because it was consciously rejected but because it was not observed or recognized appropriately. Given the incompleteness of their knowledge of new developments and the limitations on their capacity to learn and reason, rulers and legal communities could be following institutionalized rules to choose behavior, and the prevailing situation could temporarily survive a pressure toward change. The exogenous influence, however, could have set off a process undermining the status quo. In that case, change could come gradually as more information became available and the ruler and the legal community realized that the prevailing situation was no longer self-reinforcing and that an institutional refinement or change was necessary. The delay in understanding the importance of new developments explains why it took a long time for some items, such as the mechanical clock, to diffuse in Islamic societies despite the lack of significant opposition. A new development could also be rejected by default, despite being known and acceptable, if the cost of change was high. This could be the case for many of the technological developments associated with the industrial revolution, such as the steam engine, especially those that could not be easily imported or replicated. Stability in such cases could be observed despite parametric change due to high uncertainty and cost of change.¹⁸

Even when the immediate reaction was intentional and based on fairly good knowledge of a new development, the reaction could be reversed later based on other institutional developments affecting its cost and benefits to the ruler and the legal

¹⁸ For endogenous process of institutional change, see Grief (2006).

community. If, for example, one of the parties could benefit greatly from a new development but it was rejected because the other party expected to lose, this could set off a process to introduce other institutional refinements to lessen or eliminate the negative effect. At some point, these refinements could make it possible for both parties to accommodate the new development without significantly altering the course of history.

Studying long term developments helps to explain the process of adopting the printing press. In addition to reduced cost of change as a result of enhancements to the technology (for example in its adaptation to the Arabic alphabet), there were refinements to some of the institutional elements meant to reduce the technology's negative effect on the legal community. The threat to their monopoly was reduced, for example, by their ability to allow the spread of knowledge through books but making sure interpretation, especially of religious scripture and knowledge, remained in their own hands. Another refinement was their ability to block the printing of religious books while allowing secular ones. Reducing the effect of the printing press on their monopoly and welfare, the legal community eventually agreed in 1726 to its establishment in the Ottoman Empire. This was not a complete departure from institutional history at the time. Gates of interpretation was still closed to ordinary people, the legal community's monopoly was unchallenged, and the cooperative relationship between the rulers and the legal community was reinforced.

Sometimes smooth institutional refinements were not sufficient to deal with change, and major reforms and a redirection of the path of history could be required to proceed further. Too many developments could have gone unnoticed, eventually creating conflicts among different segments of the society and establishing bottlenecks that could

not be removed easily without creating other conflicts. There could also be network externalities among new developments, requiring changes to be made all at once and making fundamental transformations in other areas a precondition to change. Moreover, the cost of change could be too high due to the vested interests of other influential groups, such as the janissaries or provincial notables, with whom new alliances could be made. These conditions could have at some point forced the ruler and the legal community to enter into a confrontational relationship or reset the terms of their cooperation.

A good example of the need for major reforms may be the Ottoman efforts to reorganize the military in the nineteenth century. Whereas the Ottomans were able to adopt new types of firearms, cannons, and other technological developments quickly, it was much more difficult to change the organization of the armed forces. Reorganizing the existing corps was costly because the janissaries and other powerful groups whose welfare could be affected resisted the changes. Although the military confrontations of the eighteenth century against European armies had shown various inadequacies of the old organizational structure, attempts to deal with the problem with minor refinements did not go far.

The Ottoman ruler Selim III's (1789-1807) efforts to impose major changes despite the high cost ended up in failure, jeopardizing the traditional relationship between the ruler and the legal community. Realizing that minor institutional refinements to the existing organization had not gone far enough, he decided to circumvent the janissaries and introduce a whole new army called the New Order (*Nizam-ı Cedid*). This meant to break his cooperation with the legal community, because significant ranks among this

community had been favoring the old organization based on the perception that Selim's reform efforts were also contrary to their own interests.¹⁹ In 1807, the head of the legal community issued an opinion finding his reforms as being against the law, which essentially became the basis for deposing the ruler and executing him and many of his supporters. The traditional cooperation between the Ottoman rulers and the legal community had suffered a major setback.

Mahmud II (1807-39), Selim's cousin and successor to the throne, rejuvenated the cooperation by changing the terms of his relationship with the legal community and making key appointments at the top levels of its hierarchy. To ensure loyal cooperation from those at key positions, he dismissed the ones showing signs of opposition and replaced them with those willing and able to support him. He also took various measures to reduce the power of the legal community as a whole. Using their loyalty as support, he reintroduced a new army and readily slaughtered those janissaries that had assembled to march in protest, thus abolishing the janissary organization and breaking a powerful alliance with the legal community. He also brought waqf holdings under government control, which effectively ended the financial independence of those supported by waqf revenues. A process of secularizing the legal system started, limiting the scope of religious law and separating the judicial and religious responsibilities of the legal community, thereby relegating the position of the latter to a lower status and reducing the power of the legal community emanating from it (Berkes, 1964). These measures reset the parameters of the cooperation between the rulers and the legal community, lowering

¹⁹ Not all members of the legal community supported the janissaries against the ruler. For divisions within the ulema in their opposition to the ruler, see Heyd (1961) and Levy (1971).

the cost of change during the consequent *Tanzimat* reforms (1839-76) and ensuring the support of the legal community.²⁰

CONCLUSION

Islamic societies have shown different types of reactions against new developments in science, technology, and legal systems throughout history. While the immediate reaction to some of these developments have been negative, others have been adopted as quickly as possible, and some of these initial reactions have been modified or even reversed over time. To provide a comprehensive explanation of these complex outcomes, this paper has used insights from recent studies of institutional change. It differs from previous approaches to the problem by offering not an ad hoc explanation that considers either stagnation or change as being more typical or justifies a reaction by identifying a fixed characteristic of Islamic societies or an inherent quality of a new development, but by examining each reaction in the context of the strategic interaction between rulers and legal communities.

Some new developments, such as those in military technology, were often adopted swiftly because they were expected to make both parties better off or at least no worse off than before. But there were also other developments that were rejected immediately because one of the parties perceived it as threatening to its interests, even though the other party could have benefitted from it. The printing press or the legal concept of the corporation, for example, were initially rejected, because the legal community saw them as contrary to its interests, even though the rulers could have

²⁰ For the relationship between the rulers and the legal community during the Ottoman reforms of the nineteenth century, see Chambers (1972), Findley (1980), Heyd (1961), Levy (1971), Zubaida (2003: Ch. 4), and Zürcher (1997).

benefitted from these developments in the form of higher output and tax revenues. The rulers went along with these outcomes initially despite the associated loss because they were better off cooperating with the legal community than confronting them directly.

Some of the immediate reactions were reversed later through repeated interaction and long run processes of institutional change. In some cases, a new development could be initially rejected or ignored only because it was not fully recognized or its effects were not well understood. As more information became available and its cost and benefits were better understood, these initial reactions could be modified or reversed, as was the case in the delayed adoption of the mechanical clock and some of the technological developments associated with the industrial revolution. Even when the initial reaction was intentional and based on appropriate knowledge, reversals could follow at some point as a result of other institutional developments affecting the expected cost and benefits to one or both parties or endogenous long run processes unleashed by the reaction. This was the case for the the printing press, eventually adopted as its cost and benefits were better understood and various other developments made it more consistent with the interests of the legal community. While many of these reversals could be in the form of minor institutional refinements consistent with the basic cooperation between the rulers and legal communities, occasionally they had to restructure their cooperation and reset the parameters of their relationship to be able to deal with change, as was the case for the Ottoman reforms of the nineteenth century.

WORKS CITED

- Berkes, Niyazi. 1964. *The Development of Secularism in Turkey*. Montreal: McGill University Press.
- Chambers, Richard L. 1972. "The Ottoman Ulema and the Tanzimat," in Nikki R. Keddie, ed. *Scholars, Saints, and Sufis; Muslim Religious Institutions in the Middle East since 1500*. Berkeley, University of California Press, pp. 33-46.
- Clarence-Smith, William Gervase. 2006. "Technological and Scientific Change in Early Modern Islam, c. 1450-1850," paper presented at the IEHC, Helsinki.
- Coşgel, Metin M. 2004. "Ottoman Tax Registers (*Tahrir Defterleri*)," *Historical Methods*, 2004, 37: 87-100.
- Coşgel, Metin M. 2005. "Efficiency and Continuity in Public Finance: The Ottoman System of Taxation," *International Journal of Middle East Studies* 37 (4): 567-86.
- Coşgel, Metin and Thomas Miceli, 2006. "Tax Collection in History: Public Institutions and Institutional Change in the Ottoman Empire," Presented at the International Economic History Congress, Helsinki, Finland,
- Coşgel, Metin, Rasha Ahmed, and Thomas Miceli. 2007. "Law, State Power, and Taxation in Islamic History," presented at the Economic Research on Civilisations Conference on "The Economic Performance of Civilizations: Roles of Culture, Religion, and the Law," held at the University of Southern California in February, 2007.
- Coulson, N. J. 1964. *A History of Islamic Law*. Edinburgh: Edinburgh University Press.
- Crone, Patricia and Martin Hinds. 1986. *God's Caliph: Religious Authority in the First Centuries of Islam*. New York: Cambridge University Press.
- Eisenstein, Elisabeth. 1979. *The Printing Press as an Agent of Change*. NY: Cambridge University Press.
- Esposito, John, ed. 1999. *The Oxford History of Islam*. New York: Oxford University Press.
- Findley, Carter V. 1980. *Bureaucratic Reform in the Ottoman Empire: The Sublime Porte, 1789-1922*. Princeton studies on the Near East. Princeton, N.J.: Princeton University Press.
- Genç, Mehmet. 2000. *Osmanlı İmparatorluğunda Devlet ve Ekonomi*. İstanbul: Ötüken.
- Ghazzal, Zouhair. 2005. "The 'Ulama': Status and Function," in Choueiri, Youssef M., ed. *A Companion to the History of the Middle East*. Malden, MA: Blackwell Pub. Ltd., pp. 71-86.
- Gibb, H.A.R. and Bowen, Harold. 1957. *Islamic Society and the West: Islamic Society in the Eighteenth Century*. Parts One and Two (2 Volumes) London: Oxford University Press.
- Goldstone, Jack A. 1987. "Cultural Orthodoxy, Risk, and Innovation: The Divergence of East and West in the Early Modern World," *Sociological Theory* 5: 119-35.
- Greif, Avner. 2006. *Institutions and the Path to the Modern Economy: Lessons from Medieval Trade*. New York: Cambridge University Press.
- Güçek, Fatma Müge. 1987. *East Encounters West*. NY: Oxford University Press.
- Hall, Peter A. and Rosemary C. R. Taylor. 1996. "Political Science and the Three New Institutionalisms," *Political Studies* 44 (5): 936-57.
- Hallaq, Wael B. 1997. *Islamic Legal Theories*. New York: Cambridge University Press.
- Hallaq, Wael B. 2005. *The Origins and Evolution of Islamic Law*. New York: Cambridge University Press.
- Hassan, Ahmad Y. al- and Donald R. Hill. 1986. *Islamic Technology: An Illustrated History*. New York: Cambridge University Press.

- Heyd, Uriel. 1961. "The Ottoman 'Ulemā and Westernization in the Time of Selīm III and Mahmūd II," *Scripta Hierosolymitana* IX: 334-57.
- Hodgson, Marshall G. S. 1974. *The Venture of Islam: Conscience and History in a World Civilization*. Chicago: University of Chicago Press.
- Hogendijk, Jan P. and Abdelhamid I. Sabra. 2003. *The Enterprise of Science in Islam: New Perspectives*. Cambridge, MA: MIT Press.
- Huff, Toby E. 2003. *The Rise of Early Modern Science; Islam, China and the West*. Second edition, New York: Cambridge University Press.
- Humphreys, Stephen. 1991. *Islamic History: A Framework for Inquiry*. Princeton, N.J. : Princeton University Press.
- İhsanoğlu, Ekmeleddin. 2004. *Science, Technology And Learning in the Ottoman Empire: Western Influence, Local Institutions and the Transfer of Knowledge*, Aldershot: Variorum
- Imber, Colin. 1997. *Ebu's-suud and the Islamic Legal Tradition*. Stanford University Press.
- İnalcık, Halil. 1973. *The Ottoman Empire: The Classical Age, 1300-1600*. London: Phoenix Press.
- Iqbal, Muzaffar. 2002. *Islam and Science*. Burlington: Ashgate.
- Jones, Eric L. 1987. *The European Miracle*. Second edition. New York: Cambridge University Press.
- Kuran, Timur. 1995. "Islamic Economics and the Islamic Subeconomy ," *Journal of Economic Perspectives* 9: 155-173.
- Kuran, Timur. 2001. "The Provision of Public Goods under Islamic Law: Origins, Impact, and Limitations of the Waqf System ," *Law and Society Review*, 35 (4): 841-897.
- Kuran, Timur. 2004. "Why the Middle East Is Economically Underdeveloped: Historical Mechanisms of Institutional Stagnation," *Journal of Economic Perspectives* 18: 71-90.
- Kuran, Timur. 2005. "The Absence of the Corporation in Islamic Law: Origins and Persistence." *American Journal of Comparative Law*, 53 (July 2005): 785-834.
- Landes, David S. 1969. *The Unbound Prometheus*. New York: Cambridge University Press.
- Levy, Avigdor. 1971. "The Ottoman Ulema and the Military Reforms of Sultan Mahmud II," *Asian and African Studies* VII: 13-39
- Lewis, Bernard. 1982. *The Muslim Discovery of Europe*. New York: W. W. Norton.
- Mallat, Chibli. 1996. "Tantawi on banking Operations in Egypt," in Muhammad Khalid Masud, Brinkley Messick, and David S. Powers, eds. 1996. *Islamic Legal Interpretation: Muftis and Their Fatwas*. Cambridge, MA: Harvard University Press, pp. 286-96.
- Mokyr, Joel. 1990. *The Lever of Riches*. New York: Oxford University Press.
- Pamuk, Şevket. 2004. "Institutional Change and the Longevity of the Ottoman Empire, 1500-1800," *Journal of Interdisciplinary History* 35(2): 225-47.
- Robinson, Francis. 1993. "Technology and Religious Change: Islam and the Impact of Print," *Modern Asian Studies*, 27(1): 229-51.
- Savage-Smith, Emilie. 2003. "Islam," *Cambridge History of Science*. Vol. IV. Eighteenth century, pp. 649-68. Cambridge University Press.
- Schacht, Joseph. 1964. *An Introduction to Islamic Law*. Oxford : Clarendon Press.
- Schacht, Joseph. 1970. "Law and Justice," in P. M Holt, Ann K. S. Lambton, and Bernard Lewis, eds. *The Cambridge History of Islam*. Cambridge University Press.
- Vikør, Knut S. 2005. *Between God and the Sultan: A History of Islamic Law*. NY: Oxford University Press.

- Zaman, Muhammad Qasim. 2002. *The Ulama in Contemporary Islam: Custodians of Change*. Princeton: Princeton University Press.
- Zilfi, Madeline C. 2006. "The Ottoman *Ulema*," in Faroqhi, Suraiya, ed. *Cambridge History of Turkey*. New York: Cambridge University Press, vol. 3, pp. 209-25.
- Zubaida, Sami. 2003. *Law and Power in the Islamic World*. New York: I. B. Tauris.
- Zürcher, Erik J. 1997. *Turkey: A Modern History*. New York: I.B. Tauris.