

A Simulation Model of Katouzian's Theory of Arbitrary State and Society^{*†}

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Abstract: This paper represents an initial effort to model the volatile behavior of Iran's socio-political-economic system. More specifically, Homa Katouzian's theory of Iranian political economy—a well-established descriptive theory of Iran's unstable economic development—is translated into a system dynamics model, tested for internal consistency, and used for policy analysis. Simulation results confirm Katouzian's claim that periodic episodes of significant arbitrary power are key to understanding the historically less-than-optimal behavior of the Iranian socioeconomic system. They also confirm the significance of oil revenue, economic sanctions, and civil resistance on Iranian economic development. Of note is that experimentation with the model reveals that educational policies that generate increased respect for the law by Iranian citizens can significantly improve the behavior of the Iranian socioeconomic system. The paper concludes with suggestions for future research.

Keywords: Iran, Katouzian, Social Chaos, Arbitrary State, System Dynamics

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Over the last century Iran’s economic growth has been fairly unstable, primarily due to the dynamics of its political atmosphere (Issawi 1971; Bharier 1971; Floor 1998). The unsteadiness of Iranian economic growth can be seen in the time series data presented in Figure 1. In this figure Iranian GNP data is divided into two periods—1900-1960 and 1960-2010—so that the instabilities in the Iranian economy can be clearly identified.

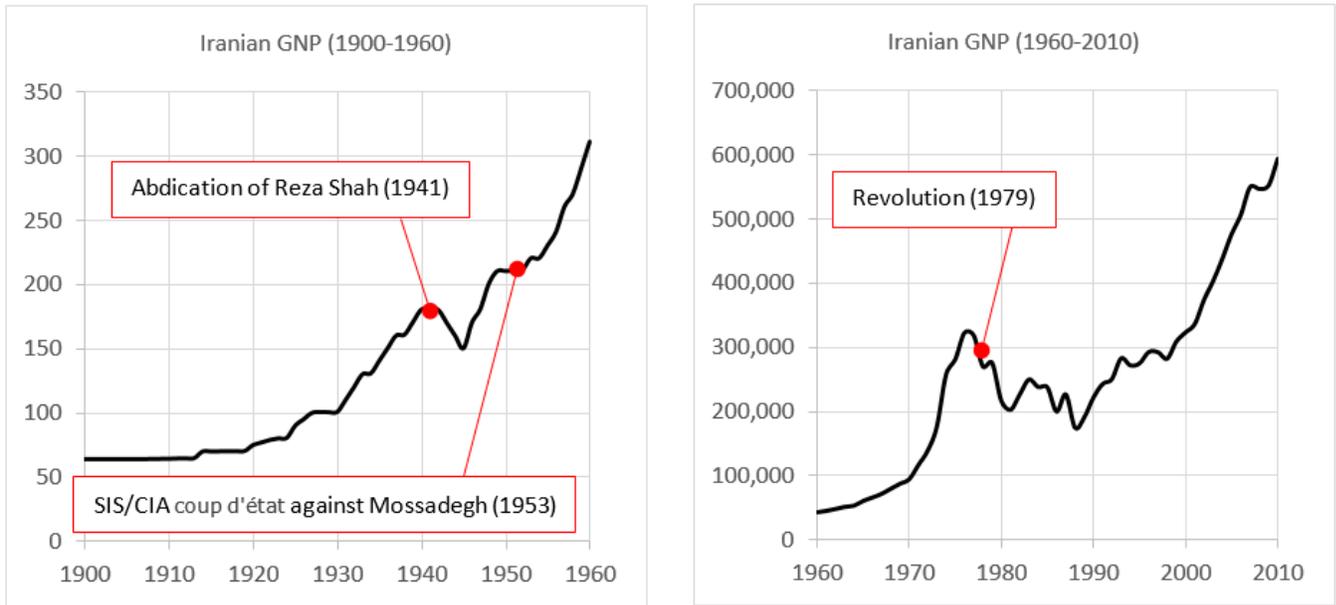


Figure 1: Real Iranian Gross National Product—in Billion Rials at constant prices⁴

An inspection of the figure reveals that the same qualitative pattern of behavior exists in both time periods – i.e., GNP initially grows exponentially until a political disruption takes place. During the 1900-1960 period Reza Shah was forced to abdicate during the Anglo-Soviet invasion of Iran in 1941, which was followed by a coup d’état against the democratic governance of Mohammad Mossadegh in 1953. In the 1960-2010 period the political system endured a crisis in the mid-1970s that precipitated the 1979 revolution. In both cases the Iranian economy collapsed after a period of political instability and it took a while for it to return to its previous pattern of growth.

In terms of a more generic and simplified pattern of behavior, the dynamics inherent in Figure 1 can be portrayed by the growth-stagnation-growth time shape presented in Figure 2. Arguably, a useful theory of Iranian socio-economic development should be able to replicate this qualitative mode of behavior.⁵

⁴ Figure 1 was created from a combination of two datasets. The first source of data, shown in the left-side diagram, comes from the work of Bharier (1971, 59), who provides a realistic estimate of Iran’s real GNP from 1900 to 1960 in *constant 1959 prices*. The second source, shown in the right-side diagram, comes from the online portal of Iran’s Central Bank (CBI 2014), which provides data on Iran’s real GNP from 1959 to 2010 in *constant 1997 prices*.

⁵ Saeed (1992) argues that complex dynamic behavior modes should be “sliced” into simpler qualitative time shapes (i.e., reference modes) so that a system dynamics modeling effort can be directed toward capturing the feedback processes that generate them.

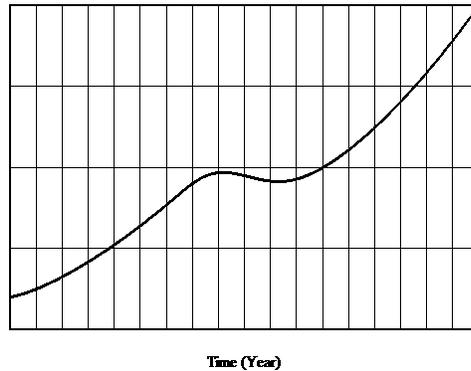


Figure 2: Reference mode representing the qualitative behavior of Iranian GNP

Since the 1970s there have been many attempts to explain the distinctive dynamics of Iran’s macro economy.⁶ The literature on Iranian economic development is vast and can be broadly divided into two major groups: quantitative analyses and qualitative (descriptive) studies. Quantitative analyses⁷, mostly econometric models, are highly dependent on numerical data and thus intrinsically unable to explain Iran’s long-term economic dynamics because most Iranian time series data only goes back to 1959. The reliability of these data is also suspect (Amuzegar 1997). Moreover, the effect of political factors such as revolution and war are normally represented as exogenous inputs into these econometric models, which implies that these phenomena are created by external forces. In fact, the very nature of the methods employed in these studies prevents a modeler from integrating Iran’s socio-political system into a model of its economic system. As a consequence, most of the modeling studies undertaken by mainstream Iranian economists have been unable to incorporate those features of Iran’s socioeconomic system that are key to understanding its dynamics. Stated differently, most quantitative analyses have utilized factors that are merely the *result* of the complex interrelationships that comprise the Iranian socioeconomic system, rather than the root *causes* that define the system’s complex interrelationships and that generate its dynamics.

Qualitative studies of the Iranian economy, on the other hand, go far deeper into the very complicated and interrelated feedback structures that define the Iranian socio-political system. Some of these studies are more general and try to explain the causes of relative economic underdevelopment in eastern societies⁸, while others are case studies that specifically focus on Iran’s socio-economic system and explain “why Iran lagged behind while the west moved forward.”^{9,10} Although these studies provide more detailed—and hence more realistic—explanations for the system’s behavior, they lack two important features that are crucial for rigorous scientific work. First, they cannot generate synthetic data that can be formally compared to numerical data from the actual system. Second, rigorous policy analysis is not possible because they cannot be used to run controlled experiments.

The purpose of this paper is to provide a rigorous explanation for Iran’s pattern of unstable economic growth. The system dynamics model put forth in this paper is based on the work of Homa Katouzian (1978; 1981; 1997; 2003; 2004; 2009; 2010; 2011), an economist and historian who created a well-known socio-political-economic theory of Iranian economic development. The approach taken in this paper is to retain the richness of a qualitative study of the Iranian socio-political-economic system and combine it with the rigor of a quantitative analysis.

System dynamics has already been used to test complex, nonlinear, and feedback-rich descriptive economic theories.¹¹ In the case of Iran the first, and arguably most important application of system dynamics to economics was put forth by Mashayekhi (1978). Mashayekhi developed a system dynamics model to analyze Iran’s long-term economic development options made possible by its oil revenue. Since the focus of this model was oil revenue and its use in economic development, and *not* the more general issues associated with Iranian political economy, it cannot be used to explain Iran’s long-run

⁶ See Esfahani et al. (2012) for a comprehensive review of Iranian macroeconomic modeling efforts.

⁷ See for example Habib-Agahi (1971), Bharier (1973), Heiat (1987), Valadkhani (1997), and Becker (1999).

⁸ Some of the most well-known theories in this area are “the Asiatic mode of production” of Karl Marx (Shiozawa 1966), Max Weber’s “theory of social and economic organization” (1947), and Wittfogel’s “oriental despotism” (Wittfogel 1957).

⁹ This question is the title of a popular book in Iran written by Kazem Alamdari (2010).

¹⁰ See for example (Katouzian 1978; 1981; 1997; 2003; Ashraf 1980; Tabatabaei 2001; Arianpour 2003; Peyman 2003; Piran 2005; Alamdari 2010).

¹¹ Radzicki (2009) reports some of these efforts in his paper.

socioeconomic dynamics.¹² That said, beyond Mashayekhi's work there has been no serious system dynamics modeling effort aimed at analyzing the dynamics of the Iranian socio-political-economic system.

This paper represents an initial effort to model the dynamics inherent in Iran's socio-political-economic system. More specifically, Homa Katouzian's theory of arbitrary state and society¹³—a very well-established descriptive theory of Iran's unstable economic development—is translated into a system dynamics model,¹⁴ tested for internal consistency, and used for policy analysis.¹⁵ Initially, the model's ability to mimic the irregular dynamics of the Iranian economy is presented. Then, the model is used to test different scenarios and policy prescriptions aimed at improving the behavior of the Iranian socioeconomic system.

In terms of building confidence in the Katouzian model, validation tests show that its dynamic behavior is consistent with the qualitative behavior of both Iranian historical data and Iran's socio-political-economic dynamics as described by Katouzian in his theory.

In terms of simulation experiments the effects of both oil revenue and the citizenry's respect for the rule of law on Iranian economic development were examined. It is shown in this paper that periodic episodes of significant arbitrary power are key to understanding the historically less-than-optimal behavior of the Iranian socioeconomic system. Simulation results indicate that if Iran was a less arbitrary system it could experience a greater pattern of economic, social, and political development. The results also show that although oil revenue has had a substantial impact on the economy it has had little effect on the overall behavior of the Iranian socio-political system. Oil revenue helps the state to accumulate more power but doesn't change the generic cycle of "arbitrary rule-chaos-arbitrary rule." Additional simulation experiments examined the impact of economic sanctions and civil resistance on the political economy of Iran. From simulations of the Katouzian model it was possible to generate some insight into the types of policies that might be effective in improving the dynamics of Iran's socio-political-economic system.

The purpose of this paper was to shed some light on the issue of the underdevelopment of a nation with an unstable socio-political environment using Katouzian's theory of Iranian political economy. Therefore, the boundary of the model was limited to Katouzian's theory of Arbitrary State and Society. The analytical capabilities of the model are thoroughly explored and reported in this paper. In particular, it is shown that the model—if customized and elaborated appropriately—can be applied to address the impact of socio-political-economic factors such as resource abundance, economic sanctions, civil resistance, cultural transformation, etc., on the system as a whole.

WORKS CITED

- A. 1978. "Mashayekhi Ali Naghi Strategy of Economic Development in Iran: Of Development on Exhaustible Resources [Book]. - Cambridge : MIT, Sloan School of Management, Ph.D. Dissertation, ."
- Alamdari, Kazem. 2010. *Chera Iran Aghab Mand va Gharb Pish Raft? (Why Iran Lagged Behind & West Moved Forward?)*. 17th ed. Tehran: Iran: Nashre Towse'e.
- Amuzegar, Jahangir. 1997. *Iran's Economy under the Islamic Republic*. London, UK: I. B.Tauris & Company, Limited.
- Arianpour, Amirhosein. 2003. "Marahel Tarikh Iran (Stages of Iranian History)." In *Ketabe Towse'e (Handbook of Development)*. Vol. 12. Tehran: Iran: Nashre Towse'e.
- Ashraf, Ahmad. 1980. *Mavane Tarikhi Roshd Sarmayedari dar Iran Doreye Qajar (Historical Barriers to Capitalism in Iran during Qajar Era)*. Tehran: Iran: Zamineh Press.
- Barlas, Yaman. 1992. "Comments on 'On the Very Idea of a System Dynamics Model of Kuhnian Science.'" *System Dynamics Review* 8 (1): 43–47. doi:10.1002/sdr.4260080105.
- Becker, Tö. 1999. *Common Trends and Structural Change: A Dynamic Macro Model for the Pre-and Postrevolution Islamic Republic of Iran*. International Monetary Fund.

¹² For a detailed and updated review of Mashayekhi's model which explores its capabilities and limitations see (Langarudi and Radzicki 2013).

¹³ The causal relationships that underlie Katouzian's theory will not be justified here as this evidence exists in Katouzian's numerous works (Katouzian 1978; 1981; 1997; 2003; 2004; 2009; 2010; 2011). The interested reader can easily refer to them for additional information.

¹⁴ A system dynamics model is essentially an institutionalist pattern model. See Radzicki (1988; 1990a; 1990b) for a comprehensive discussion of economic methodology and its relationship to system dynamics modeling.

¹⁵ For a lively discussion on the challenges inherent in translating someone else's descriptive theory into a system dynamics model see Wittenberg (1992), Sterman (1992), Radzicki (1992), Barlas (1992), and Wittenberg and Sterman (1992).

- Beharie, Neville Olivier. 1973. "Economic Policy and Development Strategy in Iran: A Macro-Simulation Approach." Ph.D. Dissertation, Urbana-Champaign: University of Illinois.
- Bharier, Julian. 1971. *Economic Development in Iran 1900-1970*. London, UK: Oxford University Press.
- CBI. 2014. "Economic Time Series Database." Economic Time Series Database, Central Bank of Islamic Republic of Iran. <http://tsd.cbi.ir/>.
- Esfahani, Hadi Salehi, Kamiar Mohaddes, and M. Hashem Pesaran. 2012. "Oil Exports and the Iranian Economy." *The Quarterly Review of Economics and Finance*.
- Floor, Willem M. 1998. *A Fiscal History of Iran in the Safavid and Qajar Periods, 1500-1925*. New York: Bibliotheca Persica.
- Habib-Agahi, Hamid. 1971. "A Macro Model for Iranian Economy: 1338-1349." Tehran: Iran: Plan & Budget Organization.
- Heiat, Abbas. 1987. "Econometric Study of an Oil-Exporting Country: The Case of Iran." Ph.D. Dissertation, OR, USA: Portland State University.
- Issawi, Charles. 1971. *Economic History of Iran, 1800-1914*. Chicago: University of Chicago Press.
- Katouzian, Homa. 1978. "Oil versus Agriculture a Case of Dual Resource Depletion in Iran." *The Journal of Peasant Studies* 5 (3): 347-69.
- . 1981. *The Political Economy of Modern Iran: Despotism and Pseudo-Modernism, 1926-1979*. Macmillan London.
- . 1997. "Arbitrary Rule: A Comparative Theory of State, Politics and Society in Iran." *British Journal of Middle Eastern Studies* 24 (1): 49-73. doi:10.2307/195668.
- . 2003. *Iranian History and Politics: The Dialectic of State and Society*. London, UK: Routledge.
- . 2004. "The Short-Term Society: A Study in the Problems of Long-Term Political and Economic Development in Iran." *Middle Eastern Studies* 40 (1): 1-22. doi:10.2307/4289884.
- . 2009. *The Persians: Ancient, Medieval, and Modern Iran*. New Haven, CT: Yale University Press.
- . 2010. "The Iranian Revolution at 30: The Dialectic of State and Society." *Middle East Critique* 19 (1): 35-53. doi:10.1080/19436141003594575.
- . 2011. "The Revolution for Law: A Chronographic Analysis of the Constitutional Revolution of Iran." *Middle Eastern Studies* 47 (5): 757-77. doi:10.1080/00263206.2011.588797.
- Langarudi, Saeed P., and Michael J. Radzicki. 2013. "Resurrecting a Forgotten Model: Updating Mashayekhi's Model of Iranian Economic Development." In *Energy Policy Modeling in the 21st Century*, edited by Hassan Qudrat-Ullah, 197-233. Understanding Complex Systems. Springer New York. http://dx.doi.org/10.1007/978-1-4614-8606-0_11.
- . 2015. "A Simulation Model of Katouzian's Theory of Arbitrary State and Society." *Forum for Social Economics*. doi:10.1080/07360932.2015.1051076.
- Peyman, Habibollah. 2003. "Avamel Baztolid Hokoumathaye Khodkameh dar Iran (Determinants of the Reproduction of Arbitrary States in Iran)." In *Ketabe Towse'e (Handbook of Development)*. Vol. 14. Tehran: Iran: Nashre Towse'e.
- Piran, Parviz. 2005. "Nazarieh Rahbord va Siasat Sarzamini Jame'e Iran (State Strategy & Policy for Iranian Society)." *Andishe Iranshahr* 6 (4): 23-34.
- Radzicki, Michael J. 1988. "Institutional Dynamics: An Extension of the Institutional Approach to Socioeconomic Analysis." *Journal of Economic Issues* 22 (3): 633-65.
- . 1990a. "Institutional Dynamics, Deterministic Chaos, and Self-Organizing Systems." *Journal of Economic Issues* 24 (1): 57-102.
- . 1990b. "Methodologia Oeconomiae et Systematis Dynamis." *System Dynamics Review* 6 (2): 123-47. doi:10.1002/sdr.4260060202.
- . 1992. "Reflections on 'On the Very Idea of a System Dynamics Model of Kuhnian Science.'" *System Dynamics Review* 8 (1): 49-53. doi:10.1002/sdr.4260080106.
- Shiozawa, Kimio. 1966. "MARX'S VIEW OF ASIAN SOCIETY AND HIS 'ASIATIC MODE OF PRODUCTION.'" *The Developing Economies* 4 (3): 299-315.
- Sterman, John D. 1992. "Response to 'On the Very Idea of a System Dynamics Model of Kuhnian Science.'" *System Dynamics Review* 8 (1): 35-42. doi:10.1002/sdr.4260080104.
- Tabatabaei, Javad. 2001. *Dibachei bar Nazarieh Enhetat Iran (An Introduction to Iranian Retrogradation Theory)*. Tehran: Iran: Negahe Moaser.
- Valadkhani, Abbas. 1997. "A Macroeconometric Model for the Iranian Economy." Ph.D. Dissertation, Brisbane: Australia: The University of Queensland.
- Weber, Max. 1947. "The Theory of Social and Economic Organization." *AM Henderson and Talcott Parsons (New York, 1947)*, 341-42.

- Wittenberg, Jason. 1992. "On the Very Idea of a System Dynamics Model of Kuhnian Science." *System Dynamics Review* 8 (1): 21–33. doi:10.1002/sdr.4260080103.
- Wittenberg, Jason, and John D. Sterman. 1992. "Modeling the Dynamics of Scientific Revolutions." *System Dynamics Group D-4334, Sloan School of Management, MIT, Cambridge, MA* 25.
- Wittfogel, Karl. 1957. "Oriental Despotism: A Comparative Study of Total Power." *Yale Univer Sity Press, New Haven*.