Continuity in Clan Politics: An Agent-Based Simulation

BY

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Post-Soviet central Asian states initially diverged into a variety of different regimes. Kyrgyzstan experimented with democracy, Uzbekistan and Turkmenistan established authoritarian regimes, while Tajikistan succumbed to civil war. Regardless what particular form their government took or whether a stable regime formed or not, each political system contains an underlying clan structure which shapes politics. Clans appear to be a form of cooperation that is long-term stable. Social trust is one mechanism that has been used to understand societal cooperation. It is not clear if social trust can be linked to the development or stability of clan politics. In this paper I use agent-based modeling to explore whether a set of basic social trust assumptions will lead to stable clan interactions or whether a pervasive social trust prevents the development of clans. Individual actors are found to prefer placing their trust in a single clan even when conditions support a more general social trust and when there are no benefits to interacting with one's own clan. The model results in a stable system where each actor places trust in only one clan even when the model's parameters are varied extensively. A complexity-based view of social trust provides a basis for understanding the stability of clan politics and its future course. Political institutions and formal politics may not be effective in limiting the influence of clans. Since clans have their roots in informal behaviors it is societal change, not formal political change, which may challenge clan politics.
Introduction

In 1716 Prince Alexander Bekovich launched one of Russia’s first expeditions into Turkic central Asia. The 3,500 man military force was destroyed outside of Khiva by the local khan and members of his clan (Allworth, 1994; Turkmenistan, 2012). Russia would wait nearly a century before staging another military action in the area. When they returned they found the clans still strong and openly anti-Russian (Roudik, 2007). Although Russia conquered Tashkent in 1864 it was only by slaughtering a mass from the Yomut clan (nearly half of the Turkmen population at that time) and brutally destroying a large military unit in Ashgabat that the clans were pacified. They did not stay quiet. Russian troops were dispatched several times to suppress dissent in Bukhara. Despite having nearly 40,000 troops stationed in Uzbekistan Russia could not disrupt the clan system or the khans until 1920 (Roudik, 2007).

Clans opposed the Soviets from the beginning of the revolution (Abdullaev and Nazarov, 2011; Paksoy, 1995). The Basmachi (bandit) rebellion erupted in 1917 around Tashkent just after the October Revolution. Civil unrest lasted for 20 years and drained military resources during both World Wars. One response was the territorialization of central Asia: new ethnic republics were created. Traditional clan structures were disengaged from one another. Movement across borders was restricted and Party officials scrutinized both public and private affairs. During this time Stalin attempted to collectivize agriculture – a move which weakened much of central Asian society but ironically strengthened clan networks. After Stalin’s death the repressed clan elites were able to capture powerful positions in the republics and a few in Moscow.

Clans could only slowly conspire under the USSR; when the dam broke in 1991 clan politics rejuvenated with their full vitality (George, 2001). High ranking clan elites were able to secure powerful political offices – including the chief executive – in every central Asian state except Tajikistan. Without Russification policies or Soviet oversight government jobs and
public resources could be distributed among clan lines without interference. Kazakhstan’s new president Nazerbayev and his family became multi-millionaires in the weeks after the fall of the USSR. Throughout Kazakhstan, Kyrgyzstan, Turkmenistan, and Uzbekistan new ethnic identities were created based on the old Soviet-imposed ones. Clans resurfaced not only as informal political networks but as a part of new national ethnic identities.

In contemporary politics clans are contributing to conflicts in Afghanistan and China. America and her allies have been fighting Afghan clans as part of the war on terror – the same clans who led armed resistance against the British during the Great Game and a prolonged guerrilla war against the Soviet Union. In Xinjiang, China small clan-like familial groups have contributed to the rise of the Eastern Turkistan Islamic Movement, a Muslim separatist organization, and may have mobilized the 2009 riots in Urumchi.

The history of clan politics shows that clans are remarkably stable. They have survived over 300 years of attempted repression and are still strong. This paper is dedicated to understanding how clans can survive such harsh conditions. What makes them so stable? What factors could destabilize them? Throughout this paper the question is investigated in a theoretical rather than empirical fashion. Theory offers a tool to understand patterns but does not prove that patterns are “real”. Nonetheless, theoretical explication is the first step in understanding these uniquely long-lived political structures.
Literature Review

A clan is fundamentally an extended family unit, but kinship is often fictive rather than biological. Throughout central Asia clans often claim to be descendants of Genghis Khan: the yüz of Kazakhstan are 100 clans each alleged to descend from one of the 100 sons he fathered among the local nomadic people. The literature on clans is political science sparse. Kathleen Collins (2003, 2004) has published a several articles and books specifically about clan politics; her work, alongside a few area studies specialists in other disciplines, is the only direct discussion about clan politics. This review will provide an overview of the current literature on clan politics. Since this literature is not as extensive as one would like, I will also review some expectations from classical works of modernization theory as well as social capital literature to provide a theoretical account of clan politics. After reviewing these topics attention will be turned toward an analytical frame - complexity theory - which is capable of providing insight into clan politics and resolving some of the concerns of modernization and social capital theory.

Perspectives on Clan Politics

With the collapse of the Soviet Union many political scientists expected that ethno-nationalism would drive domestic conflict and international relations among former Soviet republics (Fearon & Laitin, 1996; Huntington, 1996; Roeder, 1991). The Soviet Union had created new ethnic categories to lend legitimacy to their new socialist republics. Each ethnicity was given a “homeland” in the newly created USSR. These ethno-national republics, framed by an international system of morality which encouraged ethnic self-determination, were expected to assert themselves after independence. Without Soviet institutions ethnic violence should have increased, ethno-national political groups should have expanded power to articulate demands for increasing the powers and rights of their category. The result would have been
increased marginalization of Russians and other minorities in favor of the dominant ethno-national categories.

In post-Soviet central Asia these expectations were not met. Although there was mobilization over a few policies such as official languages and social studies curricula, neither ethno-nationalism or religion mobilized citizens or elites on a significant scale (Collins, 2003; Fierman, 1998; Yessenova, 2005). New states beckoned their ethnic diaspora home, but were unable to attract many people back to their supposed homelands. These states also undertook large campaigns to increase their legitimacy through ethno-national identity. Most residents of these countries profess either total ignorance about what constitutes an “Uzbek” or “Kazakh” or disagree that such a thing can exist. Rather than the expected increase in ethnic conflict ethnic cohabitation and cooperation became the norms.

Clan affiliation has proven to be the strongest source of identity useful for both mobilization and elite politics (Collins, 2004; Starr, 2006). Clan power-brokers initially became engaged with the state in order to protect their local interests from Soviet hegemony. Later, it was elite pacts among clan leaders that led to the nomination and acceptance of non-Russian leaders over the Soviet republics after Stalin’s death. Even under the burden of Soviet repression, it was the clans which empowered political leaders. Clan dynamics and pacts were the defining feature of the transitions away from Soviet rule. In Tajikistan a lack of consensus among clan elites led to decade-long civil war. The authoritarian governments in Uzbekistan and Turkmenistan rely on power sharing agreements among clan elites which were driven by promises of large payoffs from privatization. Kyrgyzstan’s fledgling democracy utilized political parties which were divided by clan lines and merely acted as proxies for clan interests. Regardless what formal political institutions have existed clans manifest as the most relevant political actors, not ethno-national identity or religion.
The scant literature on clans’ political activity shows little support for change (Collins, 2003 & 2004; Starr, 2006). Western civil-society organizations are in direct conflict with lower level government officials who rely on clan support for their positions. At the same time many citizens in these countries feel that European and American NGOs don’t understand or belong in their country. Both the clan incentive structure and local culture prevent politics from transitioning away from clan rule. The chief executives of these countries owe their power to clan power sharing agreements. Although they may like to limit the power of clans (and some rulers like Kazakhstan’s Nazerbayev have tried), ultimately the bureaucracy under the President also owe their position to clan affiliations. Parliamentary elections are the most likely source of change, but unfortunately parties in many countries are organized either partially or entirely around clan lines. Collins (2002) summarizes these observations in a simple mid-range theory: informal political factors exist as substructure underneath the formal institutions of a regime. The organization of informal politics can impede the consolidation of state power if informal and formal politics are not organized sympathetically. All the central Asian regimes must eventually return to clan politics so long as informal clan organization remain in place to undermine the state.

Modernization Theory

The relatively sparse transitology literature provides few hypotheses and no comprehensive theory building. Since there is little current development it is necessary to refer to more classic works. The current clan literature was developed from the older modernization theory. The core of modernization theory is a dichotomy between modernity and pre-modernity and the dynamics of developing into a modern society. Although modernization theory is developed from a variety of sources, one of the earliest articulations is in Max Weber’s The Protestant Ethic and the Spirit of Capitalism.
In Weber’s understanding a society is modern if decisions are made based on profitability, which requires an analysis of expected costs and returns. With modernity comes a host of institutions which support this kind of decision making: republican representation, formal articulation of laws, an effective legal system which supports strong property rights, and a division between personal and business property. In a pre-modern society decisions are based on tradition, religion, or private interests not involving cost-benefit analysis. Modern societies have formal institutions whose policies include some notion of utilitarianism. Without the rationalizing character of modernity pre-modern politics is left to benefit private interests, such as the families or friends of rulers. What prevents these private interests from being modern? Instead of comparing the value of losses to the costs necessary to obtain them they only measure apparent gains. Thus, these premodern interests prevent the development of Weber’s rational institutions because they do not have a sophisticated enough understanding of utility to warrant formalization.

No universal law is offered to understand the cause of modernization. Printed in 1905, Weber’s book is a case study of industrialization as the world had then experienced it: in Europe and America. In this context, modernization was dependant on the establishment of societal values which encourage material success. Luther’s Protestant Reformation provided this. His conception of a “calling” linked worldly material success to spiritual health. Weber validated his hypothesis in two ways. First, it is in the Protestant countries that industrialization occurred and capitalism developed. Second, within-country variation shows that wealth is concentrated in the hands of Protestants to the exclusion of other religious categories. Both at the aggregate and individual levels, modernization is coupled with the acceptance of cultural values which encourage material success.

Unfortunately Weber does not explicitly describe pre-modernity. The definition of modernity provides some theoretical expectation of what pre-modernity may be like. Modernity
involves strong formal institutions and supposes some experience with both industrialization and capitalization. Certainly the central Asian countries have not experienced industrialization and capitalism like 19th century Europe, which provides a prima facia validity for considering clan politics to be pre-modern. Furthermore clans are informal institutions with few formal features. They are not supported by a codified set of of laws, but rather by tradition and familial connection (whether fictive or by blood). Modernization, in Weber's hypothesis, requires a shift in values toward materialism. Without this value system there are no incentives to abandon clan structures and adopt democratic or capitalist institutions. However, without a more in-depth picture of pre-modernity this is merely an extension of Weber's hypothesis to a new context.

Comparative politics literature reframed modernization as an economically-grounded political process of transforming from a dictatorship into a democracy (Lipset, 1959; Przeworski and Limongi, 1997; Huber, Rueschemeyer, and Stephens, 1993). Weber's hypothesis was refined to a causal relationship between economic development, usually thought of as income per capita, and democratization. Unlike Weber 20th century political scientists recognized the need to study pre-modern societies as well as modern in order to establish causal linkages. Edward Banfield's *Moral Basis of a Backwards Society* examines an impoverished region of Italy just after establishment of their republic. His purely descriptive work offered a single hypothesis: that these pre-modern actors will maximize the material short-term advantage of their immediate family. This hypothesis presents a number of predictions, articulated in Banfield's case study, which are relevant to clan politics.

In pre-modern society only public officials are concerned with the public good. Since their compensation is based on providing for the public, they have incentives to engage in a public good. Lacking an ideological or material tie to the quality public good they will not work any harder than necessary to maintain their position. For their part voters assume that any significantly powerful group is corrupt. This belief leads them to vote for the benefits a candidate
or party has already provided, rather than the promise of future goods which may never arrive. This bleak view of both elites and the public leads to the authoritarian system synonymous with pre-modernity. Rulers also seek to maximize short-term benefits for their families, which leads to a nepotistic authoritarian system. Since peasants or voters (depending on the regime) act to enrich their own family groups, this system of overt favoritism and corruption is supported by both elites and the masses.

This view helps explain the empirical observations of clan politics in central Asia (Collins, 2003 & 2004; Starr, 2006). Since a clan is an extended family group, clan identity may be useful for elites interested in mobilizing individuals interested in family benefits. It also explains why clan pacts are successful as political agreements: modern formal institutions require a certain faith in either the public process or the people involved. Since premodernity lacks these features, Collins (2002) observations about convergence toward clan politics regardless of regime become necessary outcomes. Regardless what form these institutions take the clan system is always lurking underneath to manipulate the political machinery.

**Social Capital Theory**

Modernization theory posits a process which transforms a pre-modern society into a modern society. This change involves the formalization of a number of institutions including a capitalist economy and democratic government. Banfield’s major contribution is the idea that societal cooperation is important in modernization, but what drives this general social cooperation? Social capital theory provides that answer. The core of social capital theory is Banfield’s relationship between cooperation and public or economic outcomes. By assuming that relationship social capital research attempts to explain why cooperation emerges at all, why cooperative structures develop certain forms, and what the effect of differing forms is. While modernization theory could only posit that organizations like clans would only be found
in pre-modern societies social capital theory may provide an understanding of what specific factors lead to clan’s development and why they are so persistent. Social capital theory can be partitioned into three approaches: culturalism, structuralism, and rational choice.

The culturalist approach to social capital suggests that aggregate cooperation is driven by political culture (Putnam, 1994; Inglehart, 1971; Smith, 1999). This is largely a restatement of Weber’s approach to modernization theory. Although one causal link is retained from Weber (culture influences the development of modern institutions), this theory represents an advancement over modernization theory in that it provides an intermediating factor. Political culture influences the development of cooperation which is a necessary prerequisite for modernization. Political culture is a constellation of related values; while values are personal in nature political culture is an aggregate composed of individuals’ values. Culture is assumed to be stable in the long run, despite the possibility of significant fluctuation in an individual’s values (Inglehart, 1985). When culture does change it is in response to significant system-wide changes such as industrialization.

This demonstrates a second theoretical development of culturalist social capital theory: not only does political culture influence cooperation and political institutions, these institutions can also influence political culture. In Weber’s example not only did the Protestant Reformation induce value changes which drove the development of the modern capitalist economy, this economy also produced fundamental changes in people’s values (Inglehart, 1988). The pace of this change is unknown. Ronald Inglehart (1971) argues that political culture changes with each generation in advanced-industrial societies. Other work, including Putnam’s (1994) case study of Italian politics, suggests that political culture is significantly more stable.

Clan politics has been seen to be extremely durable: in modern history alone clan systems survived Russian colonization, the Soviet Union’s attempts to eradicate them, and independence. They have survived democracy, dictatorship, and autonomy. If political culture
is the prime causal force determining the level and form of cooperation it seems reasonable that clans would not be strongly impacted by any of these factors. Generational change has also not prevented the operation of clan politics. The answer to both change and lack of change may rest in the interaction between central Asian institutions and culture: in this area institutions have shifted radically, sometimes very quickly. Culture only changes slowly. The result seems to be a muted change in political culture which allows clans to remain stable despite significant institutional change.

There is also a thread of institutional social capital theory which examines how institutions directly influence social capital, without reference to culture (Bebbington, 1997; Coleman, 1988; Lin, 1999). Institutions are important for understanding social capital for two reasons: because institutions bring people into contact and because institutions structure access to social resources. Political parties, for example, bring otherwise disparate people into contact through various forms of political participation. They also structure who has access to social resources such as prestige and authority. Changes in social capital are linked to changes in the structure of social relations. While institutions provide a ready tool to analyze social capital in cross sectional research, there is no clear explanation for how institutions change over time. There is currently a discussion about the role of credible commitment or transaction costs (Eggertsson, 1990; North and Weingast, 1989; Shepsle, 1989). Transaction costs are a powerful construct capable of shedding light on why certain institutional arrangements appear and how they change, but it has yet to add much to our understanding of the pace or direction of change.

Institutional theories suggest slow change (North, 1981). If clans are understood to be institutions which hold and limit access to social capital than the expectation would be that clans are not likely to change unless greater changes in their social environment alter transaction costs. Since clans are largely informal, it may be that they are merely organizations which
change as a result of changes in other institutions (for other examples of this kind of responsive organization see Bates, 1981 or Heller & Mershon, 2005). In either formulation the clan system is likely to exist as long as current institutions are in place. Institutionalism does less well in explaining the long-term success of clans. Institutional changes should have resulted from democratization or Sovietization but the clan system still survived.

The economic approach to social capital is relatively new and divided approach (Durlauf, 2002). Methodological individualism, imposed from rational choice theory, takes the focus from institutions or social aggregates and places it on the individual rational agent. This approach is split on the level appropriate for conceptualizing social capital. The first strand constructs social capital as it traditionally exists in other approaches - as an aggregate concept (Poulson and Svendson, 2005). In game theoretic literature, social capital emerges as the aggregation of cooperation preferences. Individuals’ preferences collectively shift when there is sufficient information about each other to allow confidence in other people’s trustworthiness. Institutions have a role in providing information and securing credible commitments; culture may also provide an informal means of securing these ends. Although the economic approach begins from a different position it results in many of the same expectations that other social capital approaches offer.

In keeping with the individual-focused nature of rational choice theory social capital has also been reinterpreted as an individual-level characteristic. Glaeser et al.’s (2002) investment theory constructs social capital as a kind of investment into the value of personal relationships. Individuals invest time, money, and physical resources into the establishment of valuable relationships as well as the social skills and conspicuous luxury goods which may be helpful in liquidating that value. This theory makes a number of novel predictions. For example, social capital is expected to decline with age and mobility since limit the ability to recover invested resources. As an individual level theory, it is difficult to apply to an aggregate like clans or
societies. However, individual social capital does have important consequences for aggregates (Watson and Papamarcos, 2002).

All three approaches to social capital incorporate some element of trust. Either trust is an outcome of social capital, a way to operationalize social capital itself, or trust is important in producing social capital. Fukuyama (2001) is critical of confusing the relationship between trust and social capital. He describes social capital as an “instantiated informal norm that promotes cooperation between individuals.” Trust is merely one way of conceptualizing this cooperative behavioral norm. There is some danger in attributing social capital to any of the things used to describe it such as social networks, values, repeated interactions, or information about others’ preferences. These things cannot have a causal relationship with social capital, because they are merely instances of social capital in a specific context. Trust, like any of these other things, is the manifestation that social capital takes in a specific social situation.

Still, thinking about trust is not a fruitless endeavor. Understanding a particular manifestation of social capital can provide significant insights into the general concept. Comparative political scientists often employ Mill’s methods of similarity and difference to uncover general relationships at work in specific case studies (King, Keohane and Verba, 1994). By examining the different manifestations of social capital in their native habitat and comparing or contrasting the cases, we can understand a more general truth. First, by examining instances of a particular manifestation and searching for variations it is possible to discern the important differences across observations. Second, by comparing cases of each manifestation against each other we can attempt to discern important similarities or constants. These steps are especially useful in generating hypotheses which can be tested in more formal ways.

The clan, social capital, and modernization literatures provide a number of viable questions. Most striking is the lack of theoretical development with regards to clan politics. This
stems from a lack of clan literature within political science, which prohibits the construction of a theory. The two examples of modernization theories both provide avenues of research regarding clans. Following Weber’s theory it should be the case that clans are irrational entities. This idea has neither been tested nor discussed in the scant clan literature. It is not known if Banfield’s observations about Italian families are generalizable to clans also, but if so then it would be reasonable to imagine that stronger clan associations are associated with lower levels of public trust and cooperation.

Social capital literature also provides a number of ideas which are of interest in a study of clan politics. Based on Fukuyama’s (2002) discussion of social capital theory it would be prudent to examine a single manifestation of social capital such as social trust. This prevents confusion regarding the results of the study as well as assisting theoretical development. If trust is one manifestation of social capital, it ought to be the case that increasing trust results in greater cooperation. With regards to clans there are reasons to believe this is not true. Increased trust may simply mean increased trust in one’s own clan, a condition which would preempt the political ends social capital is normally assumed to have. Since trust may develop from past interactions, this relationship (if it exists) involves feedback. Does this trust-cooperation feedback effect empower clan politics? Conceivably clans provide trust among members even if they have no personal history with each other. If this initial trust leads to cooperation and if cooperation increases trust than the feedback mechanism may provide reasonable basis for the clan’s political activity.

Investigating these questions with an eye toward theoretical research will require an analytical frame with several features. First, if the aim is theoretical explication and not hypothesis testing it is not necessary to conduct empirical research. Both philosophic analysis and formal theory provide means to examine a theory without reference to empirical reality. Whatever method is chosen, empirical or otherwise, it should be capable of linking individuals'
trust or cooperation history to the aggregate social outcome. Finally, both rational choice and culturalist approaches contain some notion of iterative behavior. To include these elements the methodology employed cannot utilize static cross-sectional data, but rather must be capable of examining the individuals’ iterative interactions.

Complexity Theory

Complexity theory is a powerful analytical tool which can be applied to a wide variety of problems. Complexity focuses on the emergence of new phenomena from a set or collection of interacting objects (Johnson, 2007). The objects in question may be nearly anything: atoms, machines, packets of information, astronomical bodies, or people. When the collection of objects interact repeatedly new phenomena emerge which were not apparent based on the properties of the objects. For example, although we may know a lot about how atoms behave this knowledge is not useful in predicting meteorological events. Weather is an aggregate phenomenon which results from the repeated interactions of atoms and molecules and the effects of temperature, pressure, etc.

This approach fulfills the analytical requirements of this research project. Iterative interaction is not captured by ordinary statistical tools or field methods. Notwithstanding that these approaches are empirical rather than theoretical, iterative behavior is difficult to capture with traditional social science tools. Complexity theory is uniquely positioned to understand not only iterative interaction, but other requirements for our analytical perspective. Complexity also has a strong focus on the connection between individual behaviors and aggregate phenomena. As will be seen in the rest of this section, the generality of complexity makes it possible to apply it to nearly any problem including the durability of clan structures.
Several different mechanisms contribute to emergence. In complex adaptive systems emergence requires that there be no controller which can manipulate the actions of individual objects. Each object must be independent in the sense that it is capable of making its own decisions. From here two separate approaches to complex systems develop: those focused on how objects interact and those focused on how objects are connected.

Objects interact based on rules. Stephen Wolfram (1983; 2002) has produced a detailed comparison of objects behaving under a wide variety of simple decision making rules. The potentially infinite number of decision making rules can be condensed into four classes of macrobehavior delineated by the regularity of their patterns. In political science Robert Axelrod (1997) has published extensively on different strategies for playing the prisoner’s dilemma. Both researchers have advanced the idea that complex macrobehaviors can be understood as the result of simple decision making rules. The central difference between the approaches of Wolfram and Axelrod is in their conception of the objects. Wolfram’s objects react mechanically to the universe around them. Macrobehavioral complexity is driven by numerical patterns. This is not to suggest the patterns are trivial, in fact the significance of Wolfram’s complexity research is partly because of its generality, but the simple way in which his objects respond to their universe is often too restrictive for researchers interested in utilizing complex systems. Axelrod, alongside John Holland (1962), allow objects to learn from past experiences. Objects interact with each other competitively. Objects’ strategies are dynamic enough to allow them to choose to cooperate or defect in a prisoner’s dilemma game based on their past successes or failures. Although complex macrobehaviors can emerge without this feedback mechanism, learning and adaptation are core components in most complex adaptive systems within the social sciences.

Objects may be connected through social networks or shared information (Johnson, 2007). If objects have access to complete public information stable states often emerge (Downs,
1957; Poulson and Svendson, 2005). Downs’ spatial voting model assumes that citizens have access to all information about parties’ ideological stances. Since every person simply chooses the party closest to their ideology the model does not include complexity. Complexity is best demonstrated with imperfect information. If a model uses imperfect information, that is if objects are not aware of the states of all other objects, the level of information available influences the degree of complexity. In Poulson and Svendson’s (2005) social capital model cooperation developed as information became available. As players randomly interacted with each other in iterated prisoner’s dilemma games their strategies evolved toward cooperation. Cooperative strategies evolved because of information about other players’ preferences which allowed an individual to know who to cooperate with and who to defect against. Similarly in Down’s spatial model imperfect information prevents electoral systems from operating effectively. Interest groups, persuaders, and other agents arise to aggregate and distribute information. In both cases complex emergent phenomena arise only under imperfect information.

Emergent phenomena may manifest in different forms. Three manifestations are prominent in the literature: convergence, spontaneous organization, and nonlinearity. These three manifestations apply to different cases. Convergence may emerge from objects with heterogeneous initial values. If there is no clear reason for the convergence toward a common strategy or property than it represents an emergent trend. Spontaneous organization may emerge when objects’ relationships include feedback. Nonlinearity exists when the relationship between objects and the macrobehavior as not a linear function (straight line). This form of emergence is especially significant in spatial patterns.

Convergence is an emergent phenomena in which the same steady state is reached even when the rules or objects’ properties are varied (Wolfram, 2002). If these properties or rules are important to the research hypothesis typically they would be expected to result in varying outcomes. Complexity theory suggests that many changes can be ameliorated by the
iterated interactions of objects. Outcomes emerge from relationships between objects which are not captured in the objects themselves or certain properties of the system. Schelling's (1971) segregation model showed that segregated housing resulted even when individuals were highly tolerant of other races. The value of this result stems from the departure from expected results: tolerance should allow for mixed race neighborhoods. Convergent model outcomes are valuable when they defy expected outcomes.

Spontaneous organization occurs when objects display the ability to form a pattern and dissolve it without the presence of a controlling agent. In computer simulation the independent variables are exogenously set before the simulation occurs, so changes in the level of organization are the result of choices by objects and their influence on the environment. One application of spontaneous organization is in artificial stock markets (Palmer et al., 1994). These artificial markets become more complex and display richer trading patterns as time progresses. Instead of reaching a steady-state the market displays price bubbles, crashes, and other examples of spontaneous organization (or spontaneous disorganization, as the case may be). These spontaneously arising features are examples of the realistic details which can be achieved with frequent interactions among many objects. Conceptually spontaneous organization demonstrates that a model can achieve many different states based on the local interactions of objects.

Nonlinearity means that the effects of an independent variable are not equal at all values. In a linear relationship each unit of change on the independent variable results in the same amount of change in the dependent variable. Linearity requires constancy. Nonlinearity allows for dynamic interactions and removes the necessity of exogenous shocks to explain change (Richards, 2000). Spatial models, such as Axelrod & Bennet’s landscape theory, utilize nonlinearity to provide dynamic spatial representations of interaction (Axelrod & Bennett, 1993; Bennett, 2000). One application of landscape theory is the formation of coalitions. Coalitions
are seldom organized to reach the maximum utility possible. Instead, coalitions are formed based on a history of interactions with incremental shifts in opinion which lead to dynamic, changing coalitions based on local (relative) maxima. The presence of local maxima is a feature of nonlinearity. Nonlinearity may provide more realistic assumptions and lead to models with greater verisimilitude. These assumptions also lead to more complex behaviors, since the range of behaviors is characterized in greater detail than linearity allows.

Complexity theory focuses on the interactions of objects and the phenomena which emerge from them. Emergent phenomena are driven by the rules of interaction and shared resources. Detailed social simulations can be constructed using fairly simple rules. Objects may be connected through relationships based on repeated interaction or shared information sets. These connections enhance the possibility of emergent phenomena. Three particular forms of emergent phenomena often appear in complexity literature: convergence to a single pattern, spontaneous organization, and locally optimal positions based in nonlinearity. In each case complexity theory provides novel insights to research problems making it a powerful analytical frame for social research. In particular, it includes the necessary elements to investigate clan politics. First, the theory is built on the relationship between objects and emergent phenomena, which matches my substantive concern with the relationship between individuals and aggregate clan politics. Second, both clan politics and complexity theory involve large amounts of iterative interaction between objects (such as members of clans). Finally, complexity theory works well with both theoretical and empirical analyses. Even though this paper is non-empirical, the flexibility of complexity means that future empirical research will not be hampered by the theory’s epistemological constraints.
Model and Methodology

The Inter-clan Trust Model is an agent-based model which simulates the development of individuals’ trust in clans in a multi-clan environment. The model is constructed based on a concept of individuals as agents capable of understanding information and making choices which impact both themselves and other agents. Substantive focus is placed on individuals who develop trust through positive interaction with others. Each agent is faced with choices regarding which agents to interact with and whether or not they should cooperate when asked. Cooperation increases trust while defection and time erode trust. Each agent has their own propensity to cooperate which is improved with trust. Agents only have knowledge about the trustworthiness of clans, not individuals, allowing for interesting dynamics between individual and aggregate levels. Passive agents, who do not take actions or influence the operation of the model, are used to collect information throughout the simulation such as the relative levels of trust in each clan.

A variety of agent-based simulation environments and packages are available. The Inter-clan Trust Model was created using Repast Simphony, which implements Relogo-style simulation using turtles and patches in a Java-based environment. Repast Simphony (repast.sourceforge.net) is made available under a New BSD-style license by Argonne National Laboratories. Repast Simphony presents several advantages over other simulation softwares. Unlike general purpose programming languages Repast includes tools specifically designed for agent-based modeling. Unlike many programming languages designed for simulation, Repast includes data output to text files, charts, and visual representation through animation. Finally, unlike many other environments the Relogo-style is accessible to students as well as adept programmers.
Model Design & Components

For the Inter-clan Trust model to be successful it must be capable of capturing emergent phenomena. This is the hallmark of complexity theory. If the outcomes of the model are clearly anticipated by the mechanisms implemented, then the model does not capture emergent phenomena and fails to present novel facts. Complexity often arises when iterative interactions between individuals are allowed (Bennett, 2000). Since social capital theory posits that social trust is partially built on a network of interactions the existence of complexity in social trust is plausible. Finally, the model should incorporate a sensible account of individual behavior.

**Agents**

Each agent represents an individual who is capable of observing the clan affiliation of other agents and whether or not they cooperate. Based on these choices agents make choices about partner selection and cooperation. The population of agents is allowed to be any non-zero natural number, but throughout the model’s operation I use a population of 200 agents. During a given turn an agent will choose a partner to cooperate with, observe whether or not they cooperate, and then adjust their trust assessment accordingly.

Agents are assigned a cooperation rate representing their propensity to cooperate with others. This number is a random normal variate. The mean and standard deviation of the normal distribution they are drawn from is determined by the user and may be varied.

**Clans**

There exist $C$ number of clans numbered $c_1, c_2, \ldots, c_n$. Each agent is randomly assigned membership into a clan. Clan size is as equal as possible. Clans do not take any actions, but each agent has a subjective estimation of each clan’s trustworthiness. These subjective trust
values are denoted $t_{cn}$, where $t \in [0, 100]$.

**Trust**

Individuals develop trust in a clan by interacting with clan members. When members of a certain clan choose to cooperate with an agent, that clan appears more trustworthy. Similarly when members of a clan defect the clan is seen as less trustworthy. The specifics of the trust mechanism are drawn from Sutcliffe and Wang’s (2010) model of trust in social relationships.

Trust increments or decrements based on the partner’s response to an agent. Sutcliffe and Wang’s results show that logarithmic increases in trust and linear decay provides the most realistic distribution of trust. Based on this I use their formula for altering trust:

$$trust = (\text{maximum change in trust}) - (\text{scale factor} \times \text{trust in partner's clan})$$

The scale factor is determined by the minimum and maximum changes desired in trust per encounter as well as the maximum possible trust value:

$$s = \frac{(\text{maximum change in trust}) - (\text{minimum change in trust})}{\text{maximum possible trust value}}$$

Since $trust$ is defined on $[0, 100]$ the denominator becomes 100. The minimum change could be no less than 0, since at $t = 100$ no more increasing is possible. The maximum change is arbitrarily set at 10. Substituting these values yields:

$$s = (10-0) \times 100 = 0.10$$

Substituting this scale factor into the trust-change formula gives us:

$$trust = 10 - (0.1 \times t_{cn})$$
Each time \( t_{cn} \) is changed (as described above), the trust for other clans is decremented by 0.80. Relationships require maintenance and consistent interaction; without this interaction trust decays.

**Partner Selection**

Each turn the acting agent selects a partner and attempts to interact with them. Intuitively, each agent should prefer to interact with members of clans they trust highly. Stochastic elements in the selection process represents the possibility that agents may mistake the clan membership of some agents or may be unable to choose from their preferred clan.

Sutcliffe and Wang (2012) show that reasonable distributions of trust accumulate if agent’s weight partner selection based on trust. The first problem is to map an agent’s trust in a certain clan with the probability of selecting a member of that clan to interact with. Given an agent’s trust score \( t_n \) I map \( t_n \rightarrow p(c_n) \) where \( p(c_n) \) is the probability of selecting a member of clan \( n \) to interact with. This is accomplished by ordering each clan by the agent’s subjective trust level and using a geometric function to assign a percent-chance of being selected. Once a clan has been selected a random member from that clan is chosen as a partner.

Given \( n \) clans such that \( C_r \) is the clan ranked \( r \) according to the agent’s trust (i.e. \( C_1 \) is the most trusted clan) then the probability of selecting a member of that clan is \( 1/(2r) \). An agent will select a partner from their most-trusted clan 50% of the time, from the second most-trusted clan 25% of the time, etc. This mapping never terminates, since the formula will never return zero. To prevent this problem the last-ranked clan is assigned whatever odds are necessary to make the sum equal 100%. In effect, the two lowest-ranked clans have the same chance of being selected.
Cooperation

A partner’s cooperation rate is influenced by their trust in the calling agent’s clan. The mapping function between clan trust and cooperation is:

\[ \text{Cooperation} = \text{initial cooperation rate} + \text{trustworthiness} \]

Where:

\[ \text{Trustworthiness} = (t_{cn} \times \text{maximum change in } t \times \text{scale factor})^2 \]

The scale factor is initially set at 0.5. The impact of this decision will be tested later in the experimental section. Substituting in the appropriate values yields:

\[ \text{Trustworthiness} = (t_{cn} \times 0.10 \times 0.5)^2 = (0.05 \times t_{cn})^2 \]

Model Operation

The model operates through three phases: setup, initial trust generation, and normal operation. In the setup phase agents are created and randomly assigned clan membership and cooperation rates. Next, initial trust values are “grown” by allowing agents to randomly interact with each other non-strategically and adding a trust-premium for one’s own clan. This phase limits initialization bias by allowing reasonable trust values to accumulate from the natural progression of the model instead of being exogenously determined by the user (Banks et al., 2005). After 25 turns of random interaction each agent increases the trust in their own clan by an amount determined by the user. This value, the clan’s trust premium, is experimentally manipulated later. In the last phase trust is allowed to influence decisions about partner selection and cooperation. This is the normal phase of operation where data about variables are collected and relationships of interest are examined. Unlike the previous stage where partners are selected non-strategically, during this phase agents select partners from clans they believe
Experimental Results

Independent variables can be altered each time the model is operated. The mean and standard deviation of the distribution of cooperation rates, the premium placed on members of an agent’s clan, and the trust scale factor are included as independent variables. Complete control over independent variables provides the laboratory-like setting necessary for constructing experimental research designs. Each experiment below tests a separate feature of the model to observe its impact. Data is collected regarding the aggregate trust in each clan, average trust in agents’ own clans, and average trust in other clans. Data can also be collected at the individual level. Random number seeds are altered between each model run making each observation statistically independent.

(1) Distribution of Cooperative Preferences

In the setup phase agents are assigned a cooperation rate, representing the percentage of the time they will cooperate with other agents. The distribution of cooperation rates is normal, so there are two parameters which have consequences for the model’s operation: the mean and standard deviation of the normal distribution from which cooperation values are drawn. The data used in the figures to follow are ensemble averages (averages across replications) unless otherwise noted.

Figure 1 is a time series showing agents’ average trust throughout the model’s operation. Unsurprisingly, as the cooperation variable’s mean increases average trust also increases. When agents are more cooperative trust grows more easily. Two features are less intuitive: the shape and the long-run average of the time series at high levels of trust. When the
mean cooperation rate is set above 60%, the long-run average trust tends toward 33. When the mean of the cooperation distribution is set above 75% the time series initially increases, but then decreases until it returns to 33. Why does this happen? The setup period creates average trust values which are higher than the agents can sustain. The twin effects of relationship decay and trust-based partner selection result in a drop in average trust. Eventually each agent comes to prefer partners only from a single clan.

One interpretation of this trend is that the initialization period is a form of bias which requires controlling before reaching a clear interpretation of the model's results (Linton and Harmonosky, 2002). A second interpretation is that the first period represents a competing idea of social interaction. Since during the first 25 turns agent's select partners randomly, without observing their clan, this period develops trust as if clans were irrelevant. Although this phase does in-fact limit bias from the initialization process (Banks et al., 2004) it also serves as a baseline for comparison. If clan structures did not matter for the development of trust, we could expect that the time series would be relatively featureless. Once agent's begin observing clan affiliations, they come to prefer trusting a single clan and average trust tends toward 33 (where trust in one clan is 100 and trust in the other two clans is 0). Individual level data on inter-clan and intra-clan trust is provided in the next experiment.

Varying the standard deviation of the cooperation rate has no observable impact on average trust. This is the expected result. Increasing the dispersion of a distribution shouldn't alter the mean. Future iterations of the model use a standard deviation of three.

(2) Strength of Clan Identity

Increasing an individual's trust in a certain clan should lead to increased cooperation with members of that clan. This follows directly from the description of the model and how trust
is expected to operate. Figure 2 shows the results of increasing trust in an agent’s clan on both trust in the agent’s own clan (intra-clan trust), and in other clans (inter-clan trust). Despite the expected relationship, increasing the strength of trust in agents’ in their own clans does not lead to increased intra-clan trust. Even in the most extreme case tested intra-clan trust follows the same pattern that average trust did in experiment (1).

Why doesn’t increasing the premium for agents’ own clans increase intra-clan trust to the detriment of inter-clan trust? Figure 3 contains data from two agents throughout a single replication of the model. Each agent typifies a different kind of response to a sharp increase in clan trust. The large increase in clan 3 (fig. 3a) and clan 1 (fig. 3b) at t=25 indicates that these are the agents’ native clans. Sometimes the trust premium does work as expected (shown in 3a). Much more often this trust slowly decays as trust is developed in other clans (3b). Even with relatively high benefits to the clan an agent is assigned agents are still capable of developing much stronger bonds with agents from another clan. This clan switching phenomenon will be analyzed more in the discussion section, but it is important to note that while agents can switch their trust into another clan the result is always the focus on a single clan.

(3) Trust Scale Factor

The trust scale factor influences how strongly trust influences cooperation. Since the scale factor is not explicitly described in theory, but rather imposed by the research methods employed, it is ideal if changing the scale factor has no strong results on the outcome of the model. The scale factor may represent a threat to validity if varying it represents significant changes in the outcome (Campbell and Stanley, 1966) Figure 4 shows the results of adjusting the scale factor on average trust. Changing the scale factor does not result in a change in macrobehavior. This test does not suggest that the model is invalid.
I have proposed a simple agent-based model of clan trust which links individual trust formation to macrobehavior. The model is based on trust-based social capital literature and Sutcliffe and Wang's (2010) trust formation model. The fundamental principle of the model is that trust accumulates when individuals choose to cooperate and decreases when they choose not to cooperate or with the passage of time. Individuals form perceptions of clans based on their history of cooperation with members of that clan. Users are capable of manipulating the distribution of cooperative preferences, the size of the premium agents attribute to their own clan, and the scale parameter which influences how strongly agents’ alter their cooperation in response to trustworthiness.

Single-clan allegiance is a macrobehavior which emerges from individuals' interactions. This emerges even with several factors suggesting the contrary. Initial trust values are developed randomly and are relatively balanced. Despite this even when individuals cooperate 100% of the time and grant no premium to members of their own clan agents develop strong trust in only one clan. The clan an agent develops trust in is not always the clan they originally belonged to. Since the behavior of agents is stochastic they often develop trust in a clan other than the one they were assigned at the beginning of the simulation, even when large premiums are given to the members of an agent’s original clan. Both this result and the emergent macrobehavior are not altered by changing levels of the trust scale factor, providing some evidence for the validity of the model.
Discussion

The Interclan Trust model’s central result is that individuals should coalesce into clans. So long as we assume that individuals form relationships with members of groups that they trust this result is insensitive to a variety of factors such as the dispersion or level of trust in a population, the strength of clan identities, and how well returns to trust scale. This conclusion is the same as Collins’ (2003, 2003) observations about clan systems in the former Soviet Union. Despite the attempts of different regimes to suppress clan politics clans have not been dissuaded from political activity. Successfully simulating empirical observations suggests that the model is valid. Internal controls were used during the programming of the model to verify that the model operates correctly.

The Interclan Trust model also provides some explanation for the observations and hypotheses Collins (2004) offers. One of Collins’ propositions is that clans will remain strong under repressive regimes and return when the regime becomes weak. In the model simple trust-based interactions eventually return to regular clan-affiliation based interactions. If this is the case clans may persist despite what institutions exist around them - so long as individuals have a way to identify clan affiliation and choose who to interact with based on their clan’s reputation. Clan activity may wane if the regime is successful in depressing general social trust, but the clan system is resilient to all but very low levels of trust. When regimes become weak they may be less able to repress clan-based interactions. This allows for the apparent explosion of clan activity Collins notes. Collins also proposes that clans can make regimes more durable (2004). In the simulation clans turned random trust patterns into single-clan trust in every situation except where trust was so low that sustaining relationships was impossible. Although this doesn’t include any form of event analysis clans may in fact regularize trust. If clans are stable patterns of social interaction it is conceivable that they could support political structures.
She also suggests that elites, institutions, and ideologies have shorter-term effects than clans (2004). While the simulation does not include those elements it suggest that clans are highly stable. The experimental work provided shows that clans are not sensitive to the strength of clan identity. This supports Collins’ assertion that clans are not affected by ideology, since ideology may influence clan identity.

Collins’ (2004) final proposition mirrors the conclusion of Starr (2006): regardless what form a regime takes it eventually converges on clan domination. Regimes may be capable of altering the strength of clan identity. If a state constructs a meaningful national identity it could supplant clans as the dominant form of group identity. Many regimes have tried. Kazakhstan’s President Nazarbayev has attempted to create a Kazakh ethno-political identity, the same has happened in Kyrgyzstan and Tajikistan. All three of these countries have different regimes: Kazakhstan is authoritarian, Kyrgyzstan experimented with democracy, and Tajikistan descended into civil war without developing a state. In all three cases national identities were constructed which failed to counteract strong clan systems. The model results showed that clans were insensitive to the strength of clan identity. However, this only included the strength of a single clan’s identity compared to that of other clans. It is not clear how competing dimensions of identity would influence the results.

If clan systems continue to control politics even when regimes undergo sizable transformation, perhaps it is time to reevaluate what a “transition” is. Focusing political transitions on formal political regimes (democracy, authoritarianism, etc.) suggests that these regimes are important to understanding something about politics. At least in the central Asian experience this assumption does not appear well founded. Although regimes have changed since the days of the Soviet Union, the political lives of many residents of central Asia has not altered (Burke, 2012). Informal clan networks, elite pacts, and traditional methods of community management continue to be the most significant political aspect of many people’s lives. In
Afghanistan, which although never a part of the USSR possess a strong clan system, some people are surprised to hear that they are no longer fighting the Russians (Burke, 2012). The idea of a regime fails to incorporate the central aspects of political life in central Asia and therefore also fails to capture important transitions.

**Modernization**

The two versions of modernization theory reviewed (Banfield 1958; Weber, 1976) erred in their characterization of clan dynamics. Banfield suggest that amoral familism - the preference of individuals to procure short-term advantages for their own families - is only a transitory stage preceding modernization. Weber constructed premodern politics as an inert undifferentiated mass. These views fail to consider the micro-dynamics and macro-stability of trust based clan systems.

Banfield’s modernization theory-based case study suggests that amoral familism could only exist temporarily. In Italy the state and church could externally support the family-trust system but in the end the system would have to change. Eventually citizens would succumb to the urge to modernize and expand their trust beyond the family in order to obtain greater material advantage. The results of the Interclan Trust model show that these family-trust systems can be stable without external support. If these premodern family structures (either central Asian clans or Italian families) can persist without the assistance of exogenous institutions than belief in the necessity of modernization is not well founded. The possibility remains that external forces may catalyze modernization, but the relationship that Banfield proposes is not inherent to clan politics.

Local labor requirements may reinforce family organization. Certain kinds of land tenure rules are an incentive for the development of extended families. So long as labor economics incentivize these large family structures the amoral familist can thrive because a
large and organized family is able to reap short-term material advantage. Family structures, such as clans, can exist and persist even without external forces like land tenure laws or labor economies to reinforce them. In the model, only assumptions about trust and cooperation were included and yet individuals almost universally trusted only a single clan. There are almost certainly factors not included in the model which influence the stability of clan or family structures, but it is also significant that clans support themselves.

Since amoral familists only provide benefits for their immediate family, trust in larger public organizations ought to be impossible. Banfield’s case study and surveys are replete with examples of this lack of public spiritedness. Citizens either do not vote or vote to remove politicians who may have harmed their families, public officials are assumed to be (and often are) corrupt, and public organizations seldom started and never flourish. This assumes that organizations are not family based. In clan politics public organizations, including the state, are subsumed by family groups. This idea, alongside the regularity with which individuals identified with a single clan in the model, suggests that public organizations and a state can be organized and operated by amoral familists - so long as these organizations are aligned with family groups.

Before Banfield, Max Weber provided a more general understanding of modernization. In his theory clans are premodern arrangements because they do not operate on rational cost and benefit calculations. Premodern institutions are largely expected to be inert until the modernization process begins. Although the model does not include either a modernization process or the idea of rationality, it provides a more nuanced idea of premodern political organization. In the model interactions are based on trust and cooperation. Individuals develop trust when their partners cooperate. A steady state is eventually reached where each individual places all their trust in a single clan. This clan is not always the clan they were randomly assigned to. Individuals switch clans when partners from their native clan do not cooperate with
them. This does not strictly challenge the conception of clans as irrational entities, but it does demonstrate that individuals in premodern settings are capable of adjusting their behaviors to earn returns under certain conditions.

**Bridging and Bonding Capital**

Social capital literature contains two types of social capital: bridging and bonding (Putnam, 2000; Svendson, 2006). The relationship between the two is not entirely clear. For example, it is not clear if the two exist in a sum-zero interaction where increasing bridging capital must result in a decrease in bonding capital. The Interclan Trust model suggests that the two are not inherently related.

Increasing average cooperation does not increase cooperation between groups. I use individual agents’ cooperation rates as a representation of individual social capital. This value is an acceptable approximation of Fukuyama’s (2001) definition of social capital as an instantiated social norm which influences cooperation. Although norms are not contained in the model, this intrinsic cooperation rate is a personal trait which controls cooperation and defection. Cooperation requires a partner and the behavioral aspect of social capital is captured in the interaction of the ego agent (who selects a partner) and their partner (who chooses to cooperate). In the model social capital manifests in the form of trust in a clan. Social capital should influence both members in an interaction. Trust influences the likelihood that a partner will cooperate as well as the likelihood that an ego agent will choose a member of that clan.

Increasing social capital in the model did not lead to greater bonding capital. The first experiment varied individuals’ cooperation rates to observe changes in clan trust. Regardless how high the average cooperation rate was trust had a maximum of one-third. Individual level data showed that this number was synonymous with complete trust in a single clan. This is a high bridging capital situation with no bonding capital, similar to Banfield’s field observations.
The problem of poor societal cooperation is not solved by inducing more cooperation. This solution only leads to strong in-group bonds, but no development in the public trust (or civic virtue) believed to be important for the development of modern democracies (Putnam, 1994).

One reason that bonding capital may develop is that individuals prefer to interact with their members of their own in-group. Putnam (1994) and Banfield (1958) both observed this characteristic in Italians and suggested that this in-group preference hindered public spiritedness. During the second model experiment I varied the preference of individuals for members of their own native clan. The result was that this value did not alter either the aggregate level of trust or the balance of inter-clan and intra-clan trust. The trust premium (as I referred to it) temporarily increased average trust, but the system soon returned to its normal steady-state balance. The additional trust did not alter the system’s behavior in any notable way. The trust premium could reasonably have been expected to increase in-group trust while limiting trust between clans. Inter-clan trust was not affected by the trust premium. This result is likely because individuals already preferred single clans without the artificial trust premium.

One problem in this view is that not every individual preferred their native clan. That is, not every agent came to invest their trust in the clan which they were randomly assigned. Although each agent did eventually place their trust in one clan, preserving the system’s steady state, some agents developed trust in foreign clans. If we think of clans as Banfield’s family groups this is strangely counterintuitive. People cannot merely change families. Clans largely rely on fictive kinship and membership is not strictly enforced making it possible for individuals to claim membership in a clan different from their parent’s clan. Bonding capital is not harmed, but rather shifted into another clan. The system is not altered by this change.

The emergence of single-clan membership may be a result of the way trust and cooperation are linked. During the set-up phase of the simulation, when agents choose partners at random instead of observing their clan membership, aggregate cooperation increases
past the normal limit. Although this setup phase is intended to limit initialization bias it also provides insight into the effects of the trust mechanism. All other things being equal, when individuals choose their partners without observing clan affiliation bridging capital develops. Since aggregate trust develops far beyond the normal limit it is possible that bridging capital is enhanced as well. In either case, it is the mapping function between trust and cooperation which seems to dictate the aggregate trust trend.

The key to civil society development in central Asia may not be in the clan system itself, but in understanding how individuals choose partners to interact with. If the system can provide incentives for people to interact without paying attention to clan affiliation than the end result is expected to be expanding social trust (and therefore, social capital) without the burden of high bonding capital. Increasing trust without changing partner selection only results in high bonding capital, which has a fairly low maxima. Limiting the preference for one’s own clan has no effect. It is the relationship between trust, cooperation, and partner selection which outlines the system’s behavior, not the individual parameters.

Limitations and Future Research

Computer simulation is well suited to non-empirical theoretical research but is not useful for drawing conclusions about the external world. The Interclan Trust model is useful for exploring connections between Collins’ field work and social capital theory. Exploration is only a beginning. Empirical field work should be used to evaluate simulation results. There is little positivist research on central Asian politics published. Additional research will therefore serve two purposes: enhancing our understanding of an under-researched geographical area with unique characteristics (like clans), and using this area as test case for evaluating theory.

The Interclan Trust model involves only a fairly simple analysis. Varying the model parameters results in a change in individual behavior, but organizations and institutions are
exogenous. A more dynamic model would have allowed the number of clans or their properties to vary based on individual behaviors. A more advanced model would have allowed the clan system to appear or disappear, making the existence of the clan structure endogenous. Any of these modifications would have provided additional insight into clan politics and the underlying explanatory theory. The choice to restrict the model’s complexity was a compromise. Currently there is little work on central Asian politics and even less theoretical development. Without additional empirical observations a more complex model would fail to provide a meaningful approximation of real world behavior. However, complexity theory is general enough that it can be used in both empirical and theoretical research.
Conclusion

Central Asian clans appear to be highly durable social structures. Throughout history clans have resisted the Russian Empire, Soviet Union, contemporary America, and a variety of other military, social, and political forces. What makes clans so resilient? This research project has established that the linkage between trust and cooperation gives clans their durability. When individuals choose who to interact with based on appraisals of their clan’s trustworthiness the end result is almost invariably that they place trust in only a single clan. This is not always a person’s native clan. If local conditions are right an individual may trust only individuals of another clan. Substantively this may reflect that individuals will change clans if their local politics both allow for it and incentivize it with the possibility of a cooperative population.

Computer simulation was used to investigate the durability of clan trust. An agent-based model was implemented using the Repast simulation package which was capable of matching the substantive concerns of clan politics as well as the analytical requirements imposed by complexity theory. Individual agents were allowed to interact with each other. They were allowed to choose their own partners, whether or not to cooperate, and then could re-evaluate the trustworthiness of a clan based on their interactions. Agents could observe only the clan affiliation of a partner and whether or not they cooperated. The model allowed for independent variables to be exogenously varied, providing the opportunity for laboratory-like experiments. I varied the propensity of agents to cooperate, the value of a trust-premium for members of an agent’s own clan, and a scale factor. None of the parameters significantly altered the aggregate trust patterns, suggesting that clan politics is an emergent feature of the trust-cooperation system.

The project’s central finding is that clans are theoretically very stable. They are insensitive to changes in the average cooperation of citizens beyond a certain threshold,
variance in the average cooperation of individuals, and clan premiums. Since the policies of the
Soviet Union and others have focused on altering these factors (for example, lessening clan
premiums by creating new ethnic identities or imposing modern, rationalized institutions) these
findings have a certain retrospective precision. This research complements the field research
performed and hypotheses developed by Kathleen Collins (2002, 2003). Regime change has
not affected clans because it does not alter the fundamental patterns of interaction which allow
clans to emerge. Different post-Soviet regimes necessarily collapsed into clan dominated
institutions because clans are long-term stable while politicians, ideologies, and other facets
of political life are not. This project has also made contributions to modernization and social
capital theory. Banfield concluded that pre-modern structures (like the amoral familist) could
only survive for a short time without being propped up by external institutions. The simulation
showed the system is intrinsically stable so long as external forces do not unbalance it. Some
social capital theories have posited that general social cooperation is important in developing
bridging capital. This seems intuitive enough since bridging capital represents cooperative
norms between different social groups. However, the model suggests that increasing general
social trust may result only in an increase in bonding capital. How trust gets distributed among
individuals depends on the social structures in place. If individuals only place their social
resources with one group than increasing trust will only increase in-group trust and cooperation.
This has consequences for the development of civil society in central Asia and elsewhere.

This project was constrained by a lack of positivist empirical work on clan politics. The
simple analysis of clan politics was chosen as a compromise reflecting this lack of scholarly
attention. A more theoretical work could have been attempted, however without adequate
data or observations the project would have very limited applicability. Although this work was
not empirical the theoretical findings can be used to generate hypotheses and guide future
field work. A second limitation results from the simulation methodology. The findings do not
represent facts or relationships which I expect to find at work in the world. Instead they are the result of a computerized thought experiment. The results are only the mechanical conclusion of the constructs and assumptions of the argument. These results are still valuable because they provide a way of understanding clan politics and therefore maximize the value of what little knowledge we have of central Asia’s clan politics.
Works Cited


Appendix

Figure 1: Average Trust by Mean Cooperation Rate
Figure 2: Average Trust by Clan Bonus

Average Trust by Clan Bonus

Inter-clan Trust by Clan Bonus

Intra-clan Trust by Clan Bonus

Time
Cooperation mean = 60, Cooperation s.d. = 5
Figure 3: Two Examples of Individuals’ Trust

Figure 3a

Cooperation mean = 60, Cooperation s.d. = 5, Clan Bonus = 50

Figure 3b

Cooperation mean = 60, Cooperation s.d. = 5, Clan Bonus = 50
Figure 4: Average Trust by Scale Factor