

State Capacity and Democratization in Post-Soviet States: A Panel Data Analysis

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1 Introduction

The political, economic, and social processes of the former Eastern Bloc countries have been studied carefully over the past 24 years. The characteristics of democratization and the causes of the development of different regime types have been ascribed to deep structural and historical factors (Kitschelt 2003; Pop-Eleches 2007; Møller 2009) and to the elite actions during the critical events leading to the collapse of the Warsaw pact and the Soviet Union and the establishment of independent countries (O'Donnell and Schmitter 1986; Fish 1998; Leff 2004). The massive political, social, and economic changes in Eurasia after the fall of the Soviet Union have been diverse and profound. This is particularly so for the fifteen independent former Soviet republics. From democratization, economic liberalization, and European integration in the Baltic states to authoritarian rule and continuity of political elites in Central Asia. From clientelism and oligarchy in Russia to consolidating democracy in Georgia. From territorial and political instability in Ukraine to the cohesion and persistence of the Belarusian regime. This variety despite a common Soviet history are of great interest.

Understanding the causes of democracy and the drivers of democratization are among the most central areas of study in political science (Harriger 2010), and in a post-Soviet context understanding the causes of the variation in political trajectories is of particular interest. The foundation of my thesis is to study the dynamics behind regime formation and differentiation in the former Soviet Socialist Republics.

1.1 Conceptual notion of the state

After the second world war the social sciences to a large degree overlooked the conceptual notion of the state as anything but an object of exogenous influence, in favour of a society-centred social science, such as the class and economy driven Marxism (Marx 2008), modernization theory's focus on social and economic development (Lipset 1959), the market-based centre-periphery relations of dependency theory (Wallerstein 1974), pluralism where the state is a neutral mediator between interest groups (Dahl 1961), etc.¹ Avoiding the state as a direct object for investigation, as an actor, as a source of power, as an interpreter and creator of language and meaning, and as an entity with at least partial autonomy from civil society and the economy lead to a range of problems. A sole focus towards one concept at the expense of another, which both might enlighten and bring new insight to a particular field of study, brings with it one-dimensionality and hides away important discoveries. Conceptually, this ignorance neglects empirical reality in favour of overemphasising social or economic concepts.

With "Bringing the State Back In", P. B. Evans, Rueschemeyer, and Skocpol (1985) published a prime text in a new wave of state-centred research, where the state again became the locus of investigation. For the studies on post-communist transition, the ignorance towards the state lasted well into the 1990s (Kuzio 2001) when Linz and Stepan (1996b) proposed a conceptual understanding of democracy in which 'stateness' were a primary prerequisite.

¹See Krasner (1978) and Kuzio (2001) for a discussion of the state-society divide

With the state-centred literature came the conceptual notion of state capacity into the academic discussion. Mann (1984) laid the groundwork with the concept of the autonomous power of the state. Constructing the state as an actor partially autonomous from social forces and processes (such as class dynamics), Mann held state autonomy to depend on infrastructural power, or state capacity, defined as the ability of the state to “penetrate society, and to implement logistically political decisions throughout the realm” (Mann 1984, p.189). The conceptual notion of state capacity will be the independent variable of primary interest in the following inquiry.

1.2 Why post-Soviet

One may argue that in conducting a statistical analysis of state capacity and democratization one should attempt to include all countries with decent data coverage to facilitate generalizations valid for the generic state, no matter where on earth it is situated and no matter which internal and external effects it has exposed to. Bunce (2000) separated the comparative democratization literature in two distinct subsections based on this planetary-regional generalization divide. While preferring inclusion of all countries for its ability to infer for entire populations of a phenomenon, regional generalization can be preferable given the research question. In a study of state capacity in Latin America, Soifer (2012) argues for regional generalization as this enables capturing the particulars and nuances of a given context with positive consequences for the validity and reliability of the findings.

Post-Soviet countries have, on the face of it, common institutional and political origins, while being distinct from other countries and regions in many aspects regarding its history. To better capture the particularity of the state capacity-democracy association in such similar-origin context, I limit my research to the 15 former Soviet republics. Including former socialist countries in Eastern Europe and elsewhere¹ could be legitimised using the same argument, but I contend solely studying the post-Soviet states captures the distinct heritage of constituting the Soviet Union, not the broader Warsaw pact or socialist world. The included countries are Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan.

1.3 Research question

The research question of my thesis builds on the conceptual revitalization of the state, applying the concept of state capacity to study how and why the former Soviet republics developed as they did after the fall of the Soviet Union in 1991. The research question guiding the following inquiry is:

What effect does state capacity have on the levels of democracy and the regime trajectories of the former republics of the Soviet Union?

Specific hypotheses are specified in the theoretical framework in chapter 3. Focusing on how levels of state capacity affected the post-breakup developments may shed some important light on two key areas of interest. First,

¹Such as Mongolia with its close ties to the Soviet Union or former socialist countries in Eastern Europe.

empirically and theoretically, it is of interest to understand how state characteristics shaped the regime changes in the 15 countries. As the study of post-Soviet trajectories have implied both structural and elite based explanations, theoretical directions often viewed as contradictory, a study of state capacity may shed some light on the validity of different classes of explanations. Secondly, this study brings important empirical contributions to the concept of state capacity and its relation to democracy. Should this study support or oppose a notion of state capacity as associated with democracy, important feedback are provided for further development of state capacity.

1.4 Core concepts and definitions

By *state* I refer to the institutions and processes that successfully claim monopoly on the legitimate use of force within a territory Weber (1919). Such definition aligns with the commonly used conceptualization in political science. This definition also excludes the peace and justice of Salmond (1924) and de facto legitimacy, as the post-Soviet states not necessarily are peaceful, upholding the common perceptions of justice, or being conceived as legitimate. In the following work I utilise the Dahlian (Dahl 1986) conceptualization of the ideal type *democracy* as a political system where non-leaders exercise a high degree of control over leaders. The empirical complement polyarchy are defined as the social processes facilitating such control over non-leaders. A thorough discussion of the use and measurement of democracy can be found in chapter X.X.X. *Democratization* are understood as the social and political process in which a polity move from one level of democ-

racy to a higher level of democracy. Regime change or transition are used to refer to any change in the political system on a democracy-authoritarianism axis. The definition of *state capacity* are discussed in the literature review and research design, but the foundation of the different conceptualizations are the ability of a state to implement its policies throughout its territory.

1.5 Structure

To delimit the scope of the thesis I begin with reviewing some of the contributions to the literature on the development in the former Soviet Union and on state capacity, before the theoretical framework with the conceptual definitions and hypotheses guiding my research are presented. Following the theoretical chapters I present my research design arguing for the choice of methods and discussing the challenges of such a design. The presentation and discussion of the results are followed by model diagnostics and tests of alternative model specifications. Lastly, my findings and the path to finding them are reviewed before some limitations and implications are discussed.

2 Literature review

The dissolution of the Soviet Union, the disbandment of the Warsaw pact, and the end of the Cold War clearly stand out as the most important political changes in the world after the second world war. The literature on these topics and on the development in the former communist states are extensive. To limit the extent of this chapter I will confine the literature review to research on some broad theories on democratization applied on former Soviet and socialist countries¹ and to literature concerning the relationship between state capacity and regime types.

2.1 Democratization

The fall of the so called communist Eastern bloc with the Eastern European revolts of 1989, the symbolic fall of the Berlin wall, and the collapse of the Soviet Union in December 1991 ended the Cold War and substantially changed the international political system. As mentioned, some scholars hold the transitology discourse as central for explaining regime transitions from authoritarianism to democracy (or to continued authoritarianism) in former socialist countries. Primarily defined by two elements. First, the emphasis on elite choices and second, the belief that democratization implies reducing state power (Bunce 2000; Kuzio 2001). Huntington (1996) criticized transitology for overlooking the historical preconditions for democratization. It

¹For an introduction to the end of the Soviet Union see Marples (2004), and for a more extensive review on the fall of the communist world order see Rose (1998) and Dimitrov (2013)

purported successful transition from autocracy to democracy depended on two changes or processes. First, the establishment of representative institutions and some key political and social rights and second, the liberalization of markets and privatization of public property and services (Kuzio 2001). In the terms of Cappelli (2008, p. 533) “destatification”, this implied not only a transition, but also a reduction of the state. Further, such a conceptual understanding of undemocratic regimes understood democratic states as small and weak, while authoritarian states was understood as strong and large. Such an understanding suffers conceptually when important preconditions for democracy are omitted from theory building and empirical analysis. There are also methodological issues arising as such an understanding presupposes a one-dimensional transition with democracy and authoritarianism at either extreme, denying any alternative analyses of regime change. The need for alternative conceptualizations made way for the inclusion of state building (P. B. Evans, Rueschemeyer, and Skocpol 1985; Cappelli 2008) and nation building¹ (Linz and Stepan 1996a) in transitional analyses.

Literature in the tradition of transitology emphasized the actions of political elites and the outcomes of initial elections as determining the regime trajectories in former socialist countries. Leading the way in this line of thought were among others O’Donnell and Schmitter (1986) claiming regime types were determined not by deep structural causes, but rather by the out-

¹This does not mean Linz and Stepan (1996a) requires an understanding where one unified, coherent nation in each state is a precondition for democracy, but rather that the state must facilitate a range of identities, ethnicities, and religions in order to be a successful multicultural state; ‘state-nation’

come of the initial elections following authoritarian breakdown and the presence or absence of a coup by the former elites against a new elected political authority. Some hold the presence of institutionalized, free, and competitive elections in itself to cause consolidation of democracy (Rose and Shin 2001), although this proposition are generally only seen as necessary but not sufficient for democratic consolidation (Carothers 2007). In addition to the mere presence of elections, the outcome of the first election of the newly formed countries are proposed as a key factor of regime development (Schraeder 2002; Marsden 2005). Election outcomes in favour of a liberal opposition is claimed by some to be predicated by economic modernisation, and entails that the subsequent institutional arrangements and public policies contribute to a democratic development (Bunce 1999). Others emphasise the availability of any alternative political elite as a determinant for first election outcomes, downplaying structural and institutional factors (Fish 1998). If the opposition wins, democratic development becomes far more likely, if the position wins, authoritarian development can be expected. Oppositional loss may come not from resistance against change among voters, but weak organization of the opposition rendering it unable to negotiate with power-holders (Frison-Roche 2007). In fact, Fish (1998) found the bare availability of alternative leadership to greatly influence the prospect of democratization.

Of the possible actions of political elites before and during regime breakdown manoeuvring political forces and interests to pact with one-another is assumed to benefit the prospects of democratic development (Bunce 2004; A. B. Evans 2011). A pact between ruling groups and proponents regime

change presumably ensures integration of oppositional forces without excluding the powerholders of the old regime, thus laying the best foundation for democratic transition (Higley and Burton 2007). However, in the context of former socialist regimes, the elite pact hypothesis has not been found valid (Hellman 1998; Mcfaul 2002). Bunce (2004) noted that a complete break between the new position and the old elites is the pathway to successful democratization in post-socialist countries.

The form of government in post-authoritarian countries is another proposed contributing factor to democracy often held as dependent of choices and conscious actions. There is a clear tendency in the former Soviet Union for countries with parliamentary systems to be more democratic and presidential systems to be less democratic. Presidentialism is said to impair political routines and hinder change as it keeps the political elites of the old regime and its systems of governance in power (Bunce 1999; Fish 2006; Møller and Skaaning 2011a). In a context where the lack of political culture prevents parliamentarianism, transition outcomes in terms of presidentialism or semi-presidentialism influence the prospects of democratization. When oppositional forces were unable to provide political alternatives in a presidential system, the office of president became a successor to the General Secretary. Yet the president did not control a bureaucracy equivalent to the party, rendering the president to be far weaker in terms of political capacity, hindering democratic development (Frison-Roche 2007). Presidentialism also favours a winner-takes-all system (Linz 1985), produces deadlocks between executive and legislative branches, and bipolarity (Mainwaring 1993), all reducing

the prospects for democracy and destabilizing existing democratic systems. Should semi-presidentialism be manifested, authoritarianism will be reduced as the parliament and prime ministers from other political factions restrict the presidency (Huskey 2007). The system of government established is thus assumed to be of great importance to the development of the political regime, but criticisms of presidentialism, such as Shugart and Mainwaring (1997) arguing for the benefit of presidentialism when the legislature and party system is weak and fragmented, is also present.

Now the actor choices held vital in the transitological literature may very well be predetermined by deeper, structural causes (Coppedge 1999; Møller and Skaaning 2011a). In former socialist states voices have argued both that structural causes determine the actions of political elites and thus the trajectory of regime development (Kitschelt 2003), and that polities with varied structural backgrounds reached the same regime outcome indicating elite actions to a large degree to be autonomous from structural conditions (O'Donnell and Schmitter 1986). Moving away from the actions of conscious elites, other causes of democracy in post-Soviet countries will be reviewed.

The element of nationhood and the need for a more or less united nation, or a state capable to incorporate different nations, religions, linguistic groups, and ethnic groups have been seen as necessary for democratic development and consolidation. Roeder (1999) supported some of the theoretical assumptions of Linz and Stepan (1996b) and found a consolidated nation as a primary necessity for successful democratization in the post-communist

context.

Weiner (1987), Huntington (1993), Fish (2002), and White (2003) saw a covariance of regime types and the religious composition of post-socialist countries, echoing the Weberian view on protestant Christianity as a precondition for Western capitalism (Weber 2013). Democratic regimes are primarily protestant or roman catholic, hybrid countries tend towards orthodox Christianity, while authoritarian countries typically are Muslim. This could be due to more orthodox religious countries lacking the liberal separation between the state and religious institutions and traditions (Fox 2006). It could also be no more than a coincidence of random variation and other causes than religion should be found, or religious attitudes could be a result of the same complex, elusive, historical factors causing particular regimes to manifest the way they do.

Modernisation theory links democratisation to economic development through norms for political participation and social tolerance developed through education which increases when prosperity in the form of economic development increases (Lipset 1959). Though criticised conceptually for focusing on changes within subjects instead of changes of subjects (Huntington 1971) and empirically for being a theoretical construct not resonating with the world it studies (Rudolph 1967; O'Donnell 1973), refinements in modernization theory have pointed out that high GDP per capita affects the consolidation of democratic systems, rather than cause democratic development per se (Przeworski and Limongi 1997). Huntington (1993) found economic

progress driving democratization as this increases levels of education, facilitates cooperation over conflict, and expands the middle class, all of which lays the foundation of democracy through a culture for participation and liberal virtues. Empirical support for the traditional hypotheses of Lipset can still be found (Epstein et al. 2006), particularly in the post-Soviet countries the cases with higher levels of economic development tend to be more successful in transitioning towards democracy (Møller and Skaaning 2011a).

Class as a driving force behind democratisation has been contended by many researchers. Disagreements primarily concern which classes drive democratisation and how changes in the class structure in a society promotes or opposes democratisation. Both the bourgeoisie and the working class are primarily an urban phenomenon (Moneris 2006), but giving way to distinct theoretical contributions. The impact of theories evolving the middle class, the bourgeoisie, and how the struggle between the new urban and the old rural classes shaped the evolution of political regimes (Moore 1966) were substantial, but have faced criticism for not being empirically valid (Møller and Skaaning 2011a). As an alternative theory the political demands of the growing working class could be said to link modernisation with democratisation (Therborn 1977) when the ruling classes exchanged participation with political stability.

Inequality or poverty may pressure governments into democratization. If the material conditions of citizens is reduced sufficiently, the benefit of revolt against the government exceeds the costs. In such event the ruling elite may suppress oppositional forces or lessen the burden on citizens by

allowing some representation (Epstein et al. 2006). Conversely, if the cost of resisting change becomes overwhelming on the powerholders, reducing repression and allowing representation and participation is a possible outcome (Boix 2003; Dimitrov 2013). Where Boix saw low inequality to contribute to the prospects of democracy, Acemoglu and Robinson (2000) found median levels of inequality to increase the likelihood for democracy. High equality reduces the will to revolt in the population, while inequality subdues the masses so that repression is successful. Ansell and Samuels (2010) differentiated between the effect of income and land equality. Whereas equality of land ownership promoted democratization, for income it is inequality that promotes democracy.

Government revenue stemming from petroleum and other natural resources reduces the necessity of taxation as a source of state income, thus hindering democratization as the contractual trade of taxation against representation does not arise (Huntington 1993). The 'resource curse' is found in many cases (Ross 2001; Boix 2003; Ramsay 2011), also within the former Soviet Union (Gelman and Marganiya 2010), but theories holding resource dependence as inhibiting on democratization have been criticized for not acknowledging access to resources as a proponent of economic growth and as such contributing to democratization (Brooks and Kurtz 2012).

Other proposed contributing causes of democratization are indirect exogenous intervention (Huntington 1993) and diffusion and learning effects (Bunce and Wolchik 2013), the presence of a civil society spreading norms of

participation and facilitating oppositional organization (Shlapentokh 2003), forceful integration in the Soviet Union has had an effect on the resistance against socialist rule in the Baltic states (Dimitrov 2013), the liberalization of the economy (Kuzio 2001), and previous experience with democracy before authoritarian rule and the length of time under non-democratic rule (Turley and Luke 2011). This has not been an exhaustive review of the extensive and diverse literature on causes of democratization, but some key effects it is necessary to control for in an analysis have been presented. A presentation of the operationalization of the control variables will be presented in the research design chapter.

2.2 The state in comparative literature

As discussed in the introduction the state as a concept of study was not particularly vital before the late 1980s and early 1990s. The demise of institutional theories was to a large degree abandoned after the second world war. There were naturally attempts by some scholars, such as Nettl (1968), to argue for bringing the state into the limelight. Nettl found, in addition to the ideological bias in the post-WWI world, two factors contributing to the depreciation of the conceptual notion of the state. First, the historical development of the state, the plurality of state characteristics across countries, and the confusion of 'state'-'nation state' has lead to a conceptual ambiguity of what the state is, and thus problems of using 'the state' empirically have arisen. In facing this problem Talcott Parsons (1963) overlooked the state in

its entirety and instead studied 'the political' and 'political power' without reference to states monopoly on legitimate use of violence or its representative institutions. Second, since Watkins (1934)'s work on the state, autonomy of the associations within and below the state displaced sovereignty as a political characterization of the state. With the demise of sovereignty the analytical concept of the state also faded out of scholarly interest. Nettl exemplifies the lack of interest in the state with Lipset's (1963) work on American society, saying it "leaves no room for any valid notion of state" (Nettl 1968, p. 561).

The broad academic acceptance of the state as a phenomenon deserving attention as an autonomous actor first came after the seminal work of P. B. Evans, Rueschemeyer, and Skocpol (1985). They criticized "[d]ominant theoretical paradigms in the comparative social sciences [for not emphasizing] states as organizational structures or as potentially autonomous actors" (P. B. Evans, Rueschemeyer, and Skocpol 1985, p. vii). This duality of the state, 'Tocquevillian' as a structure mediating societal and economic forces and demands, and 'Weberian' as an actor directly initiating and implementing political action, required increased theoretical attention. Summarizing 23 years later, the 'Tocquevillian' structuralism is by far the most prevalent of the two (Skocpol 1985).

The relation between the state and political regimes is prevalent in the literature. Leading the way in such studies are Linz and Stepan (1996; 1996). Criticising the overemphasis on elections and economic liberalization of the

'third wave' literature¹ they argued for an understanding of democracy where the existence of a state is a necessity for the possibility of democratic development and consolidation, they wrote (Linz and Stepan 1996b, p. 14):

“[...] in a modern polity, free and authoritative elections cannot be held, winners cannot exercise the monopoly of legitimate force, and citizens cannot effectively have their rights protected by the rule of law unless a state exists. [...] No state, no democracy.”

Their understanding of the requirements of 'stateness', i.e. a functioning state, was twofold (Linz and Stepan 1996b). First, the state must have monopoly on the legitimate use of violence. Implied in this is little substantial conflict over the authority and domain of the state, such as political groupings contesting state power and legitimacy. Second, consensus over the rights to citizenship and a widespread loyalty to the state must be present. If the population does not identify with the state, such as portions of the Russian minority in Ukraine, the 'stateness' of the state wither. Should one or both of these requirements not be present a 'stateness problem' arises and democracy becomes an impossibility.

Subsequently a wave of research emphasized the state's role, particularly as a structure, but also as an actor, in studies of democratization, armed conflict, post-colonial development, and political economy.

¹The third wave of democratization were the widespread regime changes following the revolution in Portugal in 1974. Heavily elite lead. See Huntington (1993) for an elaboration.

The state and its characteristics have been found to be the most important civil conflict reducing mechanism. Hybrid regime states are more prone to civil conflict than democratic or authoritarian polities (Gates et al. 2006; Hegre et al. 2001; Muller and Weede 1990) and well functioning political institutions accommodate non-violent channels of influence (Cederman, Wimmer, and Min 2010), thus contributing to reducing violent conflicts. In inter and intra state wars and conflicts the state also plays a vital, but different role, this time as a directly involved conflict actor (Sarkees, Wayman, and Singer 2003). In facilitating functioning markets by upholding the property rights and the validity of contracts (Martin and Thelen 2007; Weingast 1995) and providing the physical and legal infrastructure for production and trade (C. Yanushevsky and R. Yanushevsky 2014) the state organizes and regulates the economy, without which economic growth and the well-being of the population would suffer. In international relations the state is subject of debate, particularly realism (Donnelly 2000), liberalism (Hobson 2000), and its derivatives hold the state as a central object of study and as an agent with a varying degree of autonomy from social actors and the international context.

To maintain representative institutions the state must be strong enough to formulate goals independent of non-state social interests and to implement its policies (Barkey and Parikh 1991). Lacking such autonomy and capacity the state becomes dominated by interest groups acting contrary to the general interest of the population, the state becomes 'captured' (Krastev 2003).

Møller and Skaaning (2011b) argue against the 'stateness'-thesis of Linz and Stepan on the basis that the synthesis of monopoly on violence and consensus on legitimate citizenship are not both necessary and sufficient for democracy to be established and consolidated. Their findings support the notion of stateness as one contributing factor to democracy, but it is far from sufficient on its own. In fact, when separating the concept of democracy into four subcomponents they find that 'stateness' is of great importance for the rule of law and for social rights, and contributing to, but of less importance for electoral rights and political liberties. Further, they argue for an understanding of state capacity as a related, but distinct, concept entailing "the ability to implement policies" (Møller and Skaaning 2011b, p. 2-3). Such a definition encompasses far more than 'stateness', and equating 'stateness' with capacity entails a conceptual overlap of 'stateness' and the rule of law, which by definition require some administrative capacity.

2.2.1 State capacity

The definitional discussions on what the state is and which properties underline the basic functions of modern states have been widely discussed. Terming the essence of the state 'stateness' Linz and Stepan (1996a) holding a monopoly on violence and a consensus on citizenship rights as vital for the development and consolidation of democratic regimes. The literature building directly on the stateness concept are institutional in that it describes how the state appears regarding some vital and stable structures regulating the social order. Of primary interest in this thesis are the more functional

aspect of the state. How the state copes with its tasks and how this affects other state characteristics (i.e. democracy). Commonly acknowledged functions of the state are administrative control, infrastructural services, market formation, monopoly on the legitimate use of force, the rule of law, managing public finances, etc. (Ghani, Lockhart, and Carnahan 2005). Key state capabilities are the ability of to penetrate society, regulate social relationships, extract resources, and determine the appropriate use of such resources Migdal (1988). Coping with these functions are presumed to depend on, and be a result of, *state capacity*.

Conceptualizing state capacity is imperative for the understanding of many aspects of the state. Common definitions revolve the ability of the state to implement its decisions; “the capacity of persons or collectives ”to get things done”” Parsons (1963, p.232), “the ability of state institutions to effectively implement official goals” (Hanson and Sigman 2011, p.2) and “the ability to implement policies” (Møller and Skaaning 2011b, p.2-3). Skocpol (1985) argues for an understanding of the fundamental qualities of the modern state to be access to resources, territorial control, and a Weberian bureaucracy. Capacity in this sense is the ability to take autonomous action independent of societal demand. The power of the state relative to societal groups are held as the primary characteristic of the state and such autonomous power depend on the ability of the state to penetrate its territory and implement political decisions. This ability are by Mann (1984) referred to as infrastructural power and are the key characteristic of modern capitalist states. The combination of a working bureaucracy, relative autonomy from

non-state actors, and the penetration of society are synthesized in Soifer and Hau (2008).

Building on Skocpol's, Hanson and Sigman (2011) pins down the ability to extract resources, the ability to maintain law and order through means of force, and the ability of the administrative apparatus to function independent of micromanagement by higher state officials. These three dimensions are said to cover the "core functions of the state" (Hanson and Sigman 2011, p.3) while reducing conceptual overlapping with concepts such as quality of governance, power, stateness', legitimacy, etc., to a minimum. Another central challenge when conceptualizing state capacity is to distinguish between the ability to implement policies and the decision on what to implement. Choosing to emphasize the protective functions of the state at the expense of say providing free universal health care does not logically imply weak capacities, but rather a conscious political choice. The strength of a state must be conceptually separated from the scope of state actions(Fukuyama 2004).

Generally state capacity are conceptualized equally across regional and political boundaries ¹ Hanson and Sigman (2011) views geographical and temporal coverage as one of the main challenges in concept formation. Soifer (2012) criticises the use of generic concepts and argues for adapting conceptualization to regional particulars. As abstraction of concepts are a prerequisite for its application to varied and universal phenomenon (Sartori 1970), Soifer

¹See Hanson and Sigman (2011) and Mata and Ziata (2009) for examples of what Soifer (2012) considers to be common measurement schemes.

holds that one risks making concepts “blunt” (Soifer 2012, p. 588) thereby emptying it for any useful meaning and making it less useful for empirical analysis and reducing the validity and reliability of the measurement. Taking the consequence of this argument Soifer constructs a concept of state capacity for the Latin American context and analyses data collected particularly for analysing this conceptualization.

2.2.2 Causal directions

Linking the presence, intensity and quality of state capacity, whatever such capacity is perceived as, to democracy and democratization are a thoroughly studied aspect of the state and political regimes. Historical experiences of armed conflict and military interventions have shown democracy building to consist of far more than simply removing despots from their positions. Democracy presupposes a state. This is shown through both theoretical/analytical discussions and empirical research. Without a underlying state none of the functions necessary for political representation, accountability, or the exercise of legitimate political power exists (Linz and Stepan 1996b). As such, democracy are not directly caused by state capacity, but rather a state with some basic functions are a necessary precondition for the development of democracy. There are, however, literature reversing this causal link. Some studies have found democracy and regime type to determine levels of state capacity. The presence of a basic political infrastructure are still necessary for democratization, but the levels of democracy increases political order and state capacity by legitimizing the state through political inclusion, competition, and elections (Carbone and Mimoli 2015). Others again, such

as Cappelli (2008) argues for an understanding where state capacity also are necessary for authoritarian regimes to hold power. Without some quality of its power apparatus authoritarian regimes cannot maintain dominance over its citizens. Such capacity falls under the term despotic power, the ability to implement policies and maintain power without legal or democratic restraint to the exercise of power (Mann 1984).

2.2.3 Administrative capacity

Administrative capacity is primarily a property of bureaucracy and other administrative aspects of the state. Weber (1947) defined the bureaucracy as a impersonal hierarchical organization of specialists implementing policies. Considered the back bone of the modern state, bureaucratic quality affects levels of poverty and inequality, economic growth, the neutral implementation of political decisions, and the rule of law (Beasley and Persson 2009). The ability of a state to develop policies, to produce public goods, to create and regulate social and economic infrastructure, and to regulate the economy are vital to modern democratic policies (Hanson and Sigman 2011). Contrary to this, Bäck and Hadenius (2008) found levels of administrative capacity in general to have reduced over the last 25 years, and detected a clear tendency for both democratic and authoritarian regimes to have higher levels of administrative capacity than hybrid regimes.

2.2.4 Coercive capacity

Coercive capacity refers to the ability of the state to maintain external territorial sovereignty and internal law and order, and to implement policy.

The coercive ability of the state were defined as a definitional quality of any state by Weber (1919). Being conceived as axiomatic for the existence of a state, coercive capacity are a central part of the capacities of the state (Hanson and Sigman 2011).

2.2.5 Extractive capacity

A central and recurring theme in writings on the state has been the role of taxes and revenue as the core of the state. This has particularly been seen in classical conservative and liberal theories. Hobbes (1996) saw protection of inhabitants, execution of the law, and raising of revenue as the essence of state sovereignty, while Edmund Burke claimed that “[...] [t]he revenue of the state is the state” (Burke [1790] 1988, para. 377) and that it is from state revenue all its powers originate. On his writings on sovereignty Jean Bodin wrote “The financial means are the nerves of the states” (Wang 2001a, p. 229). While Joseph A. Schumpeter argues that history best can be viewed through fiscal history, when all unnecessary elements are stripped away; “[...] the budget is the skeleton of the state stripped of all misleading ideologies” (Schumpeter 1991, p. 100), the modern state is to him a taxation state. Building on such classical theorists, the ability to extract revenue is prominently featured also in modern literature.

Some modern researchers view state capacity and revenue extraction as virtually synonymous, and further, that revenue-raising institutions imply a strong civil society (Møller 2009), unifying state and society spheres. The ability to finance its activities is a necessary condition for the rest of the

states affairs, such as establishing and maintaining a bureaucracy, upholding justice, providing public goods, protecting property rights, and maintaining the sovereignty of its borders and institutions (Bräutigam 2002). Without revenue, the state will disintegrate or collapse, its 'stateness' will seize. In order for a state to increase its power, an increase in the ability to extract taxes is essential (Wang 2001b). Without the ability to finance its activities, no such state activities may be maintained.

Historically, the link between times of war or conflict, thus the need for financing the military and state apparatus ability to sustain territoriality and sovereignty, and the emergence of revenue-raising institutions and systems is apparent in the history of Britain (the rebellion of America and the Napoleonic wars), the United States (the civil war), and others (Beasley and Persson 2009; Ross 2004). According to Beasley and Persson, military spending is the most fundamental public good that all citizens depend on, and as such it becomes vital for the building of state capacity to also enhance military spending through revenue-raising. This theory is thoroughly investigated by Tilley (1990) who assert that state capacity in the form of revenue-raising institutions have evolved as a response to the increasing costs of war.

Several mechanisms have been observed which indicate a positive covariance between revenue-raising by taxation and democratic development and liberty. According to Montesquieu (1989, pp.220-221) state demand for higher taxes to support itself and provide services forced the state to com-

compensate its inhabitants with liberty, while states with little need for taxation (ie. States rich in resources or other sources of revenue) needed not exchange taxation for liberty. Unfree states may also compensate the lack of liberty with low tax levels (Ruggiero 1927). Taxation renders the state and its citizens mutually dependent of one another so that representation, accountability, and capacity grows from taxation, at least in the cases where elites are directly affected by taxation (Bräutigam 2002). Despite this, taxation as a system for enhancing the capacity and accountability of the state is absent in policy practice in developing states (Bräutigam 2002).

Some studies have contested the direct causal connection between taxation and representation and shown how in oil economies countries that depend on taxation as an income source tend to have a more efficient bureaucracy, less corruption and stronger rule of law (Chaudry 1989; Karl 1997), properties which in turn may lead to more democratic (that is, representative and accountable) government. Taxation as a revenue source might affect democratic rule through the mediator variables of strong state institutions, state capacity or stateness. Michael Ross (2004) have shown that increased taxation relative to income does not lead to democratization, but rather that tax level relative to government services force representative and accountable rule into existence. Others again have completely dismissed the taxation-democracy link completely. In a study of 108 countries between 1970 and 1990 Jose Antonio Cheibub (1998) argued that other factors than regime type influence tax levels, such as the availability of non-tax revenue.

2.3 Research gaps

Bringing the literature review to a conclusion, I delimit some gaps in the research. The studies on state capacity have primarily been focusing on either studying one or two countries or all available countries. A lack in studies limiting the scope to a region or a group of countries make a region specific study relevant. There also are more prevalent case and historical studies, so that a statistical approach could fill a gap in the existing literature. Also, studies on former socialist countries in general are targeted at all former socialist countries, far fewer studies are targeted at only the Soviet Union.

3 Theoretical framework

Before commencing to chart out a research design with method choices and operationalizations I will present a theoretical framework for the analysis. This section are twofold. First, the theoretical background of subsections of the research question will be presented and condensed into hypotheses. Second, I will discuss the conceptualization of democracy and state capacity utilised in the analysis.

3.1 Hypotheses

3.1.1 Capacity and democracy

Grounded in the traditional, one-dimensional democracy-dictatorship dichotomy, this hypothesis are to test the assumption of transitology that democracy implies a weak or small state, while authoritarianism implies a strong state. There were assumed to be a struggle between the state and civil society (Shlapentokh 2003), regime-change were implied to require state-reduction (Cappelli 2008; Kavalski 2010), and democratization presumably necessitated economic liberalization (Kuzio 2001; Bruszt 2002; Cappelli 2008). Such relationship have been found in post-socialist countries (Melville, Stukal, and Mironyuk 2013; Kavalski 2010; Fortin-Rittberger 2012; Fortin 2012) and in polities in general (Bunce 2000).

Hypothesis 1a: *Higher state capacity leads to higher levels of democracy.*

I also include the reverse assumption, that state capacity are associated with low levels of democracy.

Hypothesis 1b: *Higher state capacity leads to lower levels of democracy.*

3.1.2 J-shaped covariance

Criticisms of transitology have particularly challenged the emphasis of state-reduction in the building of democracy (Kuzio 2001; Cappelli 2008). As argued for hypothesis 1, this one-dimensionality characterized the writings on the third democratization wave until the early 1990s. Both theoretically and empirically this assumption have been challenged by newer research. In studying the effect of democracy on levels of administrative capacity Bäck and Hadenius (2008) found a J-shaped relationship where low levels of democracy were associated with moderate levels of administrative capacity and high levels of democracy with high levels of capacity. The median values, or hybrid regimes, were associated with low levels of capacity. The relationship are explained with reference to rule from above and below. In authoritarian polities administrative capacity increases as the bureaucracy are a tool for political control. In democracies administrative capacity increases as the bureaucracy are relatively autonomous from direct arbitrary control, thus allowing the bureaucracy to function as intended by a Weberian definition. However, in hybrid regimes political power are shifting and unstable. Elites are characterized by ever shifting relations, clientelism, and

patronage. The direct political power of the state are often weak and dependent on bargaining between elites. In such an environment, administrative capacity are weak, and the bureaucracy may be corrupt and not rule-bound, in essence not qualifying for the denotation of bureaucracy.

These findings are supported by Charron and Lapuente (2011) and Kuthy (2011) who found prolonged authoritarian single-party rule to increase the quality of government¹, Skocpol (1979) arguing that the state capacity in authoritarian states aids the suppression of popular discontent and the political opposition despite its lack of legitimacy, Seeberg (2014) continues the argumentation of Skocpol and includes the interaction of state capacity and elections as stabilizing the regime as high capacity governments can prevent oppositional mobilization leading the election results to legitimize the regime. It has been countered that despite being capable of repressing opposition, authoritarian polities may not always desire to use such ability. Lack of will to resist political opposition may arise from lacking international support or international pressures for regime change, the level of institutionalization of the coercive apparatus as an rule-bound, meritocratic, and predictable apparatus are less likely to resist political change than arbitrary and crony institutions (Bellin 2004), or the lack of, or risk of future lack of financial resources. The prospects of being under-financed as a result of lacking legitimacy and thus little will to pay taxes, may reduce the will to suppress oppositional

¹By Charron and Lapuente (2011) treated as synonymous with state capacity, essentially equating state capacity with administrative capacity. The International Country Risk Guide includes corruption, law and order, and bureaucratic quality in its measure of the quality of government, while the Quality of Government survey uses the impartiality of the public administration.

movements and voices. Such an argumentation correspond to the argument of Cappelli (2008) that certain levels of 'stateness', in his article composed of capacity and autonomy, are required to qualify as either democratic or authoritarian. Without such 'stateness', countries may not even qualify as a polity in the sense of being either democratic, authoritarian, or in-between the two.

Hypothesis 2: *Democratic and authoritarian polities have higher levels of state capacity than hybrid regimes.*

3.2 On concepts and measurement

Avoiding insufficient correspondence between the theoretical concept and its counterpart the empirical phenomenon, what Sartori (1970) labels 'conceptual stretching', is imperative in social scientific measurement. Such concept validity ensures important aspects of research such as correct inferences and convergence of theoretical framework and empirical measurement, yet, there is no right way, no best solution, only "more or less acceptable alternatives" (Gerring 1999, p. 367) and the weighing of benefits and consequences. As a measure are valid when "score [...] meaningfully capture the ideas contained in the corresponding concept" Adcock and Collier (2001, p. 530), both the concept and the measure must be discussed.

3.3 Measuring democracy

To ensure good correspondence I will discuss the theoretical foundations of the concept of 'democracy' before a suitable measure are presented. The primary concern for my arguments is not what democracy ought to be in the sense of embarking on a broad philosophical debate of the history of democracy and the state, but rather the focus is on what democracy is perceived to be, how it is conceptualised by researchers and theorists. As such, the discussion will be limited to a brief overview of some central theoretical contributions and a presentation of some relevant conceptualizations.

3.3.1 Dahl's polyarchy

Robert A. Dahl (1972; 1986; 1989) were presumably one of the most influential post-war theorist of democracy. His work expanded the concept of democracy from the narrow Scumpeterian democracy to a broader concept of polyarchy. The latter concept were used alongside democracy for two reasons. First, polyarchy was used to hold concrete properties, while 'democracy' were considered as an unattainable ideal type. This facilitated clarity of arguments as one concept implied the goal or moral-philosophical idea, and another concept applied to describe the empirical features of what we label Western liberal democracies (Dahl 1986). Using polyarchy allowed imperfect countries to be graded empirically and using democracy facilitated a more philosophical discussion (Saward 2003). Second, there are no single unified theory of democracy, only many competing theories. Using polyarchy

allowed for empirical analysis of the political systems of states while still acknowledging the lack of consensus on what democracy are.

At the heart of polyarchy lies what, presumably, are the heart of democracy; the responsiveness of governments to the preferences of its equal citizens. Such responsiveness can be attained through two different paths. First, competition or contestation may, as in a Schumpeterian regime, aggregate the interests and desires of the population and hold political rulers accountable through elections. When no political position are permanent the rule should ideally be guided by the desire to continue in office, and a strong incentive to follow the 'popular will' are present in the political elites follows. If competition are free, fair, and open the government are forced by competitive mechanisms to be responsive to the preferences of the people. Second, participation incorporates popular preferences directly in political processes and in policy making. When those holding political preferences themselves actively participate in the policy formation and decision making processes their preferences are more clearly stated and integrated in the output of political practice.

Polyarchy refers directly to these two paths. Polyarchy are defined as “[the] constellation of social processes that makes [...] non-leaders exercise a relatively high degree of control over leaders” (Dahl 1986, p. 229), i.e. what commonly are perceived as the democratic goal. Contestation and participation are the core of these social processes aiming at making governing elites responsive to the preferences of citizens. Table 3.1 demonstrates a Dahlian

Table 3.1: Dahl's polity typology

Participation	+	-
Competition	+	-
+	Polyarchy	Competitive Oligarchy
-	Inclusive Hegemony	Autocracy

From Dahl (1972)

typology based on these two dimensions.

Assuming these two paths towards government responsiveness as dimensions of a political space, Dahl (1972) defines a typology of regime types. If both dimensions are scored low a polity are categorized as an 'autocracy'. Polities scoring low on contestation but high on participation are labeled 'inclusive hegemony', conversely a polity scoring low on participation and high on contestation are labeled 'competitive oligarchy'. Lastly, the term 'polyarchy' are given to polities scoring high on both dimensions.

Dahl (1972) defined seven criteria for empirically investigating the presence or absence of polyarchy in a given polity. (1) The right to vote are bestowed to most adults in an equal and fair manner, (2) most adults have the right to be elected to political positions, (3) political leaders and groups have the right to compete for the votes of citizens, (4) elections are free and fair, (5) freedom of association are present regardless of political affiliation, (6) freedom of expression are present regardless of political affiliation, and

(7) political decision making institutions rely on voting and other expressions of political preferences.

The polyarchy concept are a form of a minimalist notion of democracy. It only includes the social processes deemed necessary by Dahl for the population to exercise relatively high levels of control over leaders. According to Vreeland (2008) grounding social science in a minimalist conceptualization of democracy offers clarity of analysis and avoids conceptual and causal overlapping and confusion. Dahl (1972) considers polyarchy as a minimalist notion of democracy, elaborating on the Scumpeterian (1991) electoral democracy. Møller and Skaaning (2011b) finds this proposition justified as the presence of the rule of law is what distinguishes liberal democracy from polyarchy.

3.3.2 Freedom House index

The Freedom House index (Freedom House 2014b) is a two-dimensional measure of the 'freedom' of political regimes, yet it is often used as a measure of the level of democracy in polities. The first dimension captures participation and competition as 'political rights', while the second dimension captures civil rights and liberties as 'civil liberties'. Freedom House are together with Polity IV the most used continuous measures of democracy. Bogaards (2012) have identified no more than 38 *unique* operationalizations of democracy deriving from these two data sources. Scores are awarded by country experts for performance indicators in different categories. The 'political rights' dimension have the categories 'electoral process', 'political pluralism and participation', and 'functioning government', while the 'civil liberties' dimension have

the categories 'freedom of expression and belief', 'associational and organizational rights', 'rule of law', and 'personal autonomy and individual rights'. Scores in the two dimensions are given from 1 (greatest degree of freedom) to 7 (smallest degree of freedom) and the final Freedom index score are given as the mean of the two dimensions. According to these scores each country in a given year are labelled as either free (1.0-2.5), partly free (3.0-5.0), or not free (5.5-7.0).

Freedom House have been criticised for lack of transparency and use of subjective criterion in the development and score of the freedom index particularly compared with other democracy indices such as Polity IV, for projecting and representing "western" values (Coppedge et al. 2011), and for using the arithmetic mean to aggregate scores (Denk 2013). It has also met critique for some changes to the methodology claimed to affect the internal consistency of the index (Giannone 2010). Freedom House contends that such methodological changes have been moderate and aimed at keeping data consistent (Freedom House 2014b).

Denk (2013) argues for such an minimalist understanding of polyarchy which can be mirrored in FHI, despite FHI's inclusion of civil liberties given some modifications, to Denk polyarchy are not liberal democracy as polyarchy are primarily concerned with the procedural sides of political systems and not social rights and civil liberties. As Freedom House only provides subcategory scores back to 2006, the critique and proposed changes submitted by Denk (2013) to better aggregate scores and closer resemble Dahls polyarchy

by dropping the subcategories and aggregating subcategories into dimension by multiplication could unfortunately not be fully utilised in this thesis. But the aggregation of the two dimensions into one democracy/polyarchy measure will be done by multiplication instead of by arithmetic mean. For a closer description of and argumentation for this procedure see chapter 4.2.2.

The reason for using Freedom House as a measure of democracy in the form of Robert A. Dahls polyarchy are threefold. First, the strong support in the literature for such conceptual-operational link increases concept and measurement validity. Second, the use of Freedom House facilitates longitudinal research with good coverage of the post-Soviet states, research not possible with indices such as the Democracy Index (sporadic year coverage) and Vanhanen's Index of Democracy (ended in 2000). Third, the measure are continuous which enables differencing more and less democratic or authoritarian regimes, avoiding unintentional concealment of important empirical differences. Despite arguing for the validity of the use of the modified Freedom House index as the dependent variable, this is still just a choice among many possible and valid alternatives. Choosing between alternatives where no correct choice exists and where no best alternative can be definitively identified, an element of ambiguity characterizes the following research process. I hope the previous discussion has brought some transparency to the process of conceptualization and operationalization of the dependent variable, and as such have led to greater validity in its use.

3.4 Measuring state capacity

As the writings on state capacity contain several different conceptualizations of capacity, I base my analysis on the subcomponents that appears to be present in most multi-dimensional conceptualizations. Disagreements on the essence of state capacity differ, as seen in the literature review, so a careful choice of dimensions are needed. Following Skocpol (1985) defining access to resources, territorial control, and a Weberian bureaucracy as vital for the functioning of modern states, Hanson and Sigman (2011) conceptualizes state capacity with the three sub-capacities; administrative, extractive, and coercive capacity. These dimensions compose the primary generic state capacity defined as the properties “that are minimally necessary to carry out the functions of contemporary states” (Hanson and Sigman 2011, p.3). Extractive capacity are measured as tax revenue as proportion of GDP. Administrative capacity are measured with a range of indicators of such aspects as bureaucratic quality, civil service confidence, census frequency, and contract intensive money. Coercive capacity are measured by several indicators such as military expenditures per million inhabitants, political terror, and anocracy. Such a measure captures the broad and multi-faceted nature of the tasks and abilities of states. States need coercive capacity to maintain internal and external sovereignty, and to implement policies. Extractive capacity is necessary to finance the activities of the state and is beneficial as it binds the state and the people together in a contractual relationship. Administrative capacity is needed to organization and coordination of the activities of the state, to formulate and implement policies, and to deliver public goods.

The composite variable are taken from a preliminary version of Hanson and Sigman (2011) State Capacity Dataset, a attempt at creating a measure of state capacity based on the dimensions commonly assumed to be fundamental for state functions without overlapping with other concepts such as regime type, good governance, state autonomy, and institutional quality. Such measure are made aiming at broader use in the research community, so that studies of state capacity are based on the same conceptual and operational definition of capacity. Data are gathered from a range of different sources and by using Bayesian latent variable analysis, a measure of state capacity are compiled. The measure are standardized with $\mu = 0$ and $\sigma = 1$, and are approximately normally distributed.

3.5 Summary

In this section I have presented the hypothesis used in the further research, and defined the conceptualization and operationalization used for the dependent and independent variables. Next, the research design used will be presented.

4 Research design

In this chapter I will present a research design with the purpose of testing the hypotheses in question. While the previous chapters have narrowed down the research questions and presented the theoretical framework for the analysis, this chapter will present the methods and procedures for analysing the empirical material. First, the choice of statistical methods are argued for. Second, panel data analysis are presented. Third, the methods for non-linear analysis are discussed. Forth, the dataset and control variables are reviewed. Fifth, the treatment of missing data are presented. Lastly, some methodological challenges are discussed.

4.1 General direction of methods

Deciding the methodological starting point and the practical methods of a scientific work is by some characterized as a choice which only can be decided by a pragmatic discussion of the data, the research problem, and the purpose of the study (Collier, Brady, and Seawright 2004). Others contend that differing methods often are equally valid, and that the choice more often than not comes down to the personal preferences, skills, and beliefs of the researcher, the demands of project financial sources, etc. (John 2010).

As seen in the previous chapters both qualitative and quantitative methods are prevalent within comparative political science, and both have their distinct benefits and disadvantages. However, there are in the literature some strong voices prioritizing statistical approaches to social science. Lijphart

(1971) defines scientific explanation as finding an empirical relationship between variables while other effects are controlled for. He further holds that when possible statistical methods should be preferred over comparative methods and case-studies. Continuing this argument King, Keohane, and Verba (1994) holds that qualitative and quantitative methods builds on the same logical foundations, but that the latter outranks the former as a tool for analysis. Also in a purely philosophical discussion statistics have in 'positivist-oriented' thought priority over other methods (except the experiment) as it facilitates manipulation of social data in an controlled 'experiment-like' environment (Moses and Knutsen 2012). Critics have argued against statistical methods on the grounds of overlooking the complexity, contextuality, connectedness, and constructiveness of the social world (Baert 2005). Aiming at describing and explaining the changes and effects in the relationship between state capacity and democracy in all former Soviet republics, statistical methods facilitates finding general trends and effects for these countries.

As seen in the literature review studies of democratic transition and state-building of post-Soviet states ...

4.2 Cross-sectional time-series analysis

Statistical inference with as little as 15 units will not suffice as small-N reduces degrees of freedom with efficiency loss and increased the probability of type II errors. Cross-sectional analysis alone is thus out of the question. To achieve N high enough for valid inference I turn to cross-sectional time-series

analysis, or panel data analysis. For each country a range of annual observations from 1992 to 2009 are gathered to form a panel dataset with dimensions $(N = 15) * (T = 18)$. This gives 270 observations for each variable rather than 15. Panel data analysis increases the degrees of freedom and introduces more variability facilitating more precise parameter estimation, it facilitates understanding changes over time, and it does so in a computationally simple manner (Hsiao n.d.).

Within a panel data framework there are several possible estimators. Choosing between estimators are usually done by a Hausman test revealing inconsistencies in an estimator (Hausman 1978; Wooldridge 2002; Rabe-Hesketh and Skrondal 2012). Alternatively it has been argued that this approach gives results due to insufficient statistical power rather than results indicating consistency in one estimator and that the decision on which estimator to use should be guided by a theoretical discussion of the purpose and demands of the analysis (Clark and Linzer 2015). To avoid this pitfall estimator selection should primarily be guided by the purpose of the analysis.

4.2.1 Fixed effects

The main hypothesis of this thesis are that an increase in state capacity gives an increase in levels of democracy. This enables using a estimator based solely on within-subject variation. Fixed effects models estimate parameters by using such within-variation and by removing and controlling for time-invariant effects. The primary benefit of fixed effects are the reduced possibility of omitted variable bias as any unobserved time-invariant effects

are controlled for, it also lessens the burden on variable selection as a range of vague and incomprehensible background factors does not explicitly need to be measured. Naturally, employing fixed effects presupposes that estimating time-constant factors are not of direct theoretical interest.

Models for fixed effects estimation are transformed to remove time-invariant factors. Beginning with the general model:

$$y_{it} = \alpha_i + \sum \beta x_{i,t} + v_i + \epsilon_{it} \quad (1)$$

Where y_{it} is level of democracy for a given country i in a given year y , α_i is the time-invariant individual specific effects, $\beta x_{i,t}$ is the estimated predictor for a independent variable in a given country in a given year, v_i is the time-invariant individual specific error term, and ϵ_{it} is the overall error term. To remove time-invariant effects the within transformation of the average over time for each country are calculated. This gives the following:

$$\bar{y}_{it} = \alpha_i + \sum \beta \bar{x}_{it} + v_i + \bar{\epsilon}_{it} \quad (2)$$

Subtracting the averages from the model:

$$(y_{it} - \bar{y}_i) = \sum \beta (x_{it} - \bar{x}_i) + (\epsilon_{it} - \bar{\epsilon}_i) \quad (3)$$

With the demeaned model the time-invariant country specific effects are re-

moved. The following are a simplified writing of the same model:

$$\ddot{y}_{it} = \sum \beta \ddot{x}_{it} + \ddot{\epsilon}_{it} \quad (4)$$

Fixed effects estimation are performed on equation 3/4 using ordinary least squares estimation. The alternative estimator between effects are estimated by OLS on equation 2, while random effects are a weighted average of the estimates of fixed and between effects. Note how equation 4 does not contain a β -intercept. The reported constant are the estimated average of all country fixed effects.

Both support and criticism of the fixed effects approach have been raised. Some voice concern for its lack of emphasis on institutional effects on between-variation (Kittel and Obinger 2002) thus preferring approaches such as random effects, others maintain support for its use as controlling for unobserved historical factors are of vital importance for the political analysis of countries (Garret and Mitchell 2001). As long as hypothesis testing is limited to the within-variation, fixed effects approaches are generally efficient and unbiased (Plümper, Troeger, and Manow 2005).

4.2.2 Endogenous heterogeneity/Omitted variable bias

One can assume that the effect of many cultural, religious, institutional, geographical and historical factors that is correlated with both dependent and independent variables is constant through time, and subsequently being controlled for by the fixed effects estimator even when excluded from the

model. Effects mentioned in the literature such as complex historical fabric of each state, previous experience with democracy, geographical features, elite actions during the Soviet breakup and the preliminary post-Soviet development, etc. Excluding easily measured factors such as previous experience with democracy are not of primary interest, but rather unspecific historical or cultural factors that are notoriously difficult to measure which, if assumed to be constant, are importantly controlled for by fixed effects.

4.2.3 Assumptions

Any statistical endeavour rely on sets of assumptions for valid inference, fixed effects analysis are not an exception. Of great theoretical interest for my hypothesis testing are the assumption that the linear relationship between independent and dependent variables all have the same slope change β . Deviation from this assumption may result in insignificant results. Fixed effects allow time-invariant country specific effects to covary with the independent variables. However, no omitted factors affecting fluctuation in the dependent variable is allowed. ϵ_{it} is assumed to have a mean of 0, being uncorrelated with the independent variables, being not autocorrelated, and being homoskedastic. Heterogeneity are often prevalent in non-randomly sampled political science data (Baum 2001), but country clustered standard errors can correct biased standard errors. Normality is not assumed, but the estimator would be more efficient given normal distributed ϵ_{it} .

4.2.4 Significance and hypothetical populations

The general position on testing for statistical significance considers it only to be necessary when analysing a sample with the objective of estimating parameters or infer conclusions by testing hypotheses for a larger population (Cowger 1984; Grimm 1993; Ringdal 2007). When a population and the analysed sample are the same unity the purpose of testing statistical significance becomes dispensable. Two expostulations breaks, according to Rubin, with this common assumption. First, statistical testing is necessary “in order to determine the likelihood that the observed differences among subpopulations could have been generated by a random (or chance) division of the population into subpopulations” (Rubin 1985, pp. 218-219). That is, to infer about the causal processes behind population data and to link findings to theoretical analysis, significance testing is deemed a necessity (Blalock 1972; Rubin 1985). Second, despite having a true population, there is no guarantee against future changes in the population weakening the inferences, making tests for statistical significance important, if theoretical explanations are to be valid for possible new or future units (Rubin 1985).

In this thesis, all 15 post-soviet states are investigated, and as such there should, according to some, be no need for testing statistical significance as there is no larger population to which findings could be generalised and the probability of omitted units is virtually non-existent. However, despite primarily being of concern when predicating future phenomenon, significance testing results supports the validity of findings for subsequent future time

periods or for possible future changes in the post-Soviet state structures.

4.3 Non-linear relationships

Testing the relationship between state capacity and democracy for non-linearity, or more specifically for a J-shaped relationship, require a non-linear estimation method. Several options exist such as the exponential models of generalized methods of moment estimation, linear analysis of log-transformed exponential relationships, and non-linear least-squares. The latter procedure fits the model to the data finding the least squared residuals of the fit while relaxing the assumption of linearity (Teunissen 1990). Using this approach, I model a quadratic function describing the relationship between the variables as parabolic. The bivariate function of the model have the standard form $y = ax^2 + bx + c$ and are estimated through Stata's non-linear least-squares framework. Choosing to model a polynomial of the 2nd degree ensures a evenly estimated graph¹ while revealing any non-linear pattern in the data. Any higher polynomial degrees should be avoided as overfitting the model explains random fluctuations rather than the general trend of the data, hindering inference of general statements (Bilder and Manning 2015) and diminishing the possibility for any substantial theoretical contributions (Sartori 1970). The non-linear fit are first estimated for a simple bivariate model including only state capacity and democracy. Subsequently I will estimate a fixed effects model with capacity interacted with regime type including control variables.

¹Evenly implying a curve containing only one vertex (critical point).

4.4 Operationalization

4.4.1 Dataset

Time-series nested in cross-sectional units are the backbone of panel data analysis. 1991 are dropped as the Soviet Union collapsed in late December giving and as data coverage are limited. As the availability of the state capacity measure are limited temporally, each of the 15 countries consists of a time-series from 1992 to 2009, giving a total potential of $N*T = 15*18 = 270$ country-year observations for each variable. Data are gathered from a range of sources, both official statistics compiled directly from intergovernmental organizations and from published research datasets. The measure of state capacity are taken from a preliminary version of the State Capacity Dataset (Hanson and Sigman 2011). For a list of variable description and data sources, please see table A.1 in Appendix A.

4.4.2 Method of Aggregation

In the majority of studies aggregation by arithmetic mean is implicitly assumed as the default choice (Nardo et al. 2008, p.103). Yet, research benefits greatly from a more reflective choice of method of aggregation. The choice must be motivated by theoretical and/or conceptual arguments. As seen in table 4.1, Munck (2009) complies five different methods for aggregating indicator scores into indices. Two decisions must be made. First, the relationship between indicators must be declared as either interactive (values on one indicators are influenced by values on other indicators) or noninteractive (values are unaffected by other values). Second, the relationship between indicators

are either compensatory (a low value on one indicator can be compensated for by a high value on another indicator) or noncompensatory. The principle of compensation are in many cases not theoretically valid. According to Goertz (2008) the noncompensatory aggregative techniques borrows some underlying logic from the qualitative literature where necessary and sufficient conditions weakens the possibility of compensation and as such punishing low values with lower total values. For instance whether compensation should be allowed when constructing a measure for democracy depends on the theoretical foundations of the democracy concept. On the indicator level, it is not theoretically obvious that low state revenue as a percentage of GDP could be compensated by a high number of employees in the state bureaucracy, or that a strong monopoly on violence can compensate for low consensus on citizenship rights. When it comes to FHI, in the Dahlian concept of polyarchy, a low score on political rights can be compensated with a high score on civil liberties. The result of using additive aggregation in such cases could be information loss in the composite measure or bias towards low scoring dimensions or indicators over those scoring higher, both which may weaken the correspondence of concept and measurement.

To aggregate with multiplication for a group of n observations o_1, o_2, \dots, o_n simply take the product of the observations $\prod o_i = o_1 * o_2 * \dots * o_n$ or with weights; $\prod o_i^{w_i}$ where $\sum w_i = n$.

Using this logic on the measure of democracy I, for approximation of the Dahlian polyarchy, multiply the political rights and the civil liberties vari-

Table 4.1: Five basic rules of aggregation

Aggregation rule	Relationships between indicators	Example: 0.5, 0.5, 1.0
Multiplication	Interactive noncompensatory	0.25
Minimum	Noninteractive noncompensatory	0.5
Geometric mean	Interactive compensatory (partially)	0.63
Arithmetic mean	Noninteractive compensatory (partially)	0.66
Maximum	Noninteractive compensatory	1

From Munck (2009) via Denk (2013)

ables. This new variable range from 1 to 49 where low score imply democratic country-years and high scores imply non-democratic country-years.

4.4.3 Alternative variables

For purposes of validity alternative dependent and independent variables are used in chapter 6. The unmodified Freedom Index and polity2 from Polity IV, both much used measures of democracy, are used to cross-validate the findings.

Administrative capacity, are measured using a measure of government quality from the ICRG dataset. The measure are aggregated from three sub-components. First, the states ability to control corruption, second, the strength and independence of the judicial system and the general observance of the law, and third, the expertise and autonomy of the bureaucracy (QOG institute 2009). This includes both the rule of law presumed to be precondi-

tioned on administrative capacity, (Møller 2009), the theoretical definition of bureaucratic organizations (Weber 1947), and lack of corruption as a symptom of bureaucratic capacity. Administrative capacity are measured ranging from 0 to 1.

An indicator for extractive capacity are chosen aiming at simplicity and reducing conceptual stretching. As extractive capacity reflects the ability of the state to raise revenue, particularly aiming at revenue requiring a high degree of state capacity, thus excluding income from natural resources, import tolls etc. Consequently, I measure extractive capacity as tax based revenue as percentage of GDP.

4.4.4 Control variables

Measuring the effect of the relationship between and the effect of state capacity on/and democracy requires controlling for other factors contributing to democracy. To validate a claim of a causal relationship between the two a sound theoretical argument must be made, covariance must be observed, the cause must predate the effect, and other factors contributing to the dependent variable must be held constant (Lijphart 1971; Agresti and Finlay 1986). As controlling for all possible causes of democracy (King, Keohane, and Verba 1994), avoiding spuriousness requires selecting control variables based on a review of theories on causes of democracy are necessary. Grounding the analysis in a fixed effects model relieves much of the pressure on finding the relevant factors to control for, as unobserved time-invariant effects are controlled for by including country specific fixed effects. Relevant

variables which can be left out of the model are factors such as initial election outcome, previous experience with democracy, and more vague historical factors. This is a great benefit to my analysis as the former Soviet Union are characterized by unclear causal patterns (Ekiert 2003; Pop-Eleches 2007). To validate my findings and find a 'truer' relationship between state capacity and democracy I control for the following effects grounded in the review in chapter X.X.X. Socio-economic modernization are measured by gross domestic product per capita in year 2000 US dollars. To control for both the presence of the bourgeoisie and working classes the proportion of the population living in urban areas are included. As inequality may have an effect I include a squared GINI coefficient for disposable income. Controlling for 'resource curse' effects, oil exports per capita are included. To hold the effect of market liberalization a measure of fiscal freedom are included.

4.5 Missing observations

Missing observations are a serious problem in statistical analysis. Biased and inefficient estimates may result from using incomplete data (Honaker, King, and Blackwell 2011). Missingness can be correlated with the missing values (Missing not at random), correlated with other variables in the data but not the missing values itself (Missing at random), or not correlated with either missing values, other observed variables, or other unobserved effects (Missing completely at random). Only the two latter can be imputed without severe validity costs.

4.5.1 Description

In the capacity-democracy dataset missingness is prevalent in some of the proposed control variables. Measures of democracy and state capacity are complete for all countries and all years. In table C.1 in appendix C the proportion of missingness in each variable can be seen. As seen figure C.1 the primary cause of missingness in the data appears to be the time of observation. Years early and late in each time-series have higher levels of missingness than intermediary years. Assuming no unobserved cause of missingness and no pattern of autocorrelated missingness, the missing-year covariance indicates data missing at random. Such pattern allows imputation of missing values. Late missingness presumably comes from the delay between occurrence and registration, early missingness from confusion of early transition years and lack of state ability to register data. The latter may indicate a correlation of missing data and state capacity as administrative capacity covers the ability to collect, store, and publish data.

4.5.2 Handling missing observations: Amelia II

As the data are time-series cross-sectional, ordinary multiple imputation such as included in Stata gives inefficient imputations. To incorporate both within-subject and between-subject variation, as well as the autocorrelation of time, the expectation-maximization bootstrapping algorithm of Amelia II fulfils these demands. Samples of bootstrapped parameters are computed before imputed values are drawn from the parameter distribution. Multiple imputed datasets are generated and analyses are performed on each before

parameter estimates are averaged to yield final results. The purpose of imputing variables are not to find the 'true' value of the missing observation, but to facilitate valid inference based on existing data. As missingness are not severe for all variables¹, 5 datasets are generated. Problems of N relative to degrees of freedom and some multicollinearity necessitates an reduction of the covariances by $0.03 \times \text{observations}$ to achieve stable algorithm runs.

Summary statistics of imputed and non-imputed data can be seen in table C.2 in Appendix C. Imputed data resemble the non imputed data quite well. The variable with the largest percentage of missingness, `icrg-qog`, at 55.93 percent missing observations with unimputed $\mu = 0.474$ and $\sigma = 0.098$ gives imputed $\mu = 0.493$ and $\sigma = 0.090$.

4.6 Methodological challenges

4.6.1 Endogeneity

A key assumption of regression analysis are that the independent variables are not correlated with the error term of the equation. Should such covariance be present estimates may be over- or underestimated. When estimates does not, on average, converge to the real value in the population, estimates are biased. Endogeneity is primarily caused by omitted variable bias, measurement error or a circular relationship where X affects Y which again affects X .

¹See table C.1 in Appendix C

Omitted variable bias occur when omitted variable are correlated with both the dependent and at least one independent variable (Rabe-Hesketh and Skrondal 2012). A strong theoretical foundation are the primary safeguard against such bias. As my analysis are conducted by a fixed effects regression controlling for time-invariant individual specific effects, only unobserved time-varying omitted variables are of concern. This implies that deep and stationary or slow-changing structural, geographical, historical, cultural, religious, institutional, and political factors does not need to be addressed with regard to such bias. Avoiding endogeneity caused by omitted variables depends solely on a thorough theoretical discussion and inclusion of the variables deemed necessary to control for such bias.

When there is error in the measurement of a phenomenon and such error are non-random, endogeneity may arise. To control for such errors data have been double checked for input errors and in chapter 6 alternative measures of democracy/polyarchy and state capacity are modelled to cross-validate my findings.

4.6.2 Heterogeneity

When the variance of residuals vary between units group-wise heteroskedasticity exists in a panel data model. Heteroscedastic residuals does not cause biased estimates, the estimates still tend to vary around the true parameter value. But the variance of estimates might be affected, and hypothesis testing suffers. Testing the null hypothesis of whether the variance of each panel

unit is significantly different from the overall variance $H_0 : \sigma_i^2 = \sigma^2$ gives a χ^2 distributed modified Wald statistic with $DF = N_g$ under the null hypothesis. As the test is modified it is applicable also when the assumption of normally distributed residuals is violated. The test suffers from low statistical power for fixed effects with large N and low T (Baum 2001), but this should not affect the testing on my data. Should heterogeneity be present, standard errors could be clustered on country to counteract lack of efficiency.

4.6.3 Multicollinearity

A final factor in this discussion is multicollinearity, which, seemingly, is particularly prevalent in post-soviet or post-communist settings (Ekiert 2003; Pop-Eleches 2007). Multicollinearity occurs when the independent variables are highly correlated either in pairs or as a group. Consequences of multicollinearity include large standard errors, blurred individual coefficients, and non-significant individual coefficients (low t-statistic) despite the complete model itself being correctly significant (high F-statistic) (Ringdal 2007). If multicollinearity is present and not corrected, testing for the statistical significance of the independent variables becomes problematic as the probability of rejecting the null-hypothesis decreases (Midtbø 2007). As tests for variance inflation factors does not apply in the Stata environment for panel data, country and time specific dummies are included in an OLS-regression to facilitate testing for multicollinearity. This replicates the same results as within-transformation and enables VIF testing to be performed.

4.6.4 Autocorrelation

For panel data estimators autocorrelation of the idiosyncratic error term causes overestimated standard errors and thus loss of statistical efficiency and a risk of type 1 errors (Drukker 2003). When the idiosyncratic error e_{it} , the error that changes between individuals and over time, is correlated with itself over time the consequences for testing hypotheses can be grave. To test for autocorrelation a Wooldridge test (Wooldridge 2002) is performed. The test rests on few assumptions and are easily implemented in Stata. If the idiosyncratic error e_{it} is not autocorrelated, the correlation of e_{it} and the first-differenced $e_{it} - e_{it-1}$ equals to -5. By performing a Wald test on the null hypothesis of no autocorrelation, a regression of residuals on its first-differenced counterparts are performed, and any difference from -5 are given as a low p-value. Autocorrelation may come from between-subject heterogeneity, the exclusion of a lagged dependent variable from the model, or slowly moving and underlying time trends (Rabe-Hesketh and Skrondal 2012). Given the presence of autocorrelated residuals a range of robust standard error estimation methods exists, all with its benefits and disadvantages.

4.6.5 Cross-sectional dependence

Baltagi, Feng, and Kao (2008, p.2) describes cross-sectional dependence in panel data as “interaction between cross-sectional units”, a phenomenon usually seen as a result of behavioural interactions such as imitation and learning, or common unobserved external factors. When not controlled for

due to being unaware of such factors, lacking theoretical grounds, or inattention, such phenomenon is absorbed in the idiosyncratic error term e_{it} (Huyos and Sarafidis 2006) where it can cause problems for statistical inference. As with autocorrelation, cross-sectional dependence can inflate the standard errors, thereby leading to inefficient hypotheses testing. In some cases inconsistent estimators, where estimates does not converge towards the true parameter value as sample sizes increase, might also occur. The Breusch-Pagan test is based on the estimates of the correlations of the residuals and tests if the correlation matrix of the residuals e_{it} is an identity matrix:

$$\begin{pmatrix} 1 & 0 & \cdots & 0 \\ 0 & 1 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & 1 \end{pmatrix}$$

Using the formula:

$$LM = T \sum_{i=2}^{N_g} \sum_{j=1}^{i-1} r_{ij}^2$$

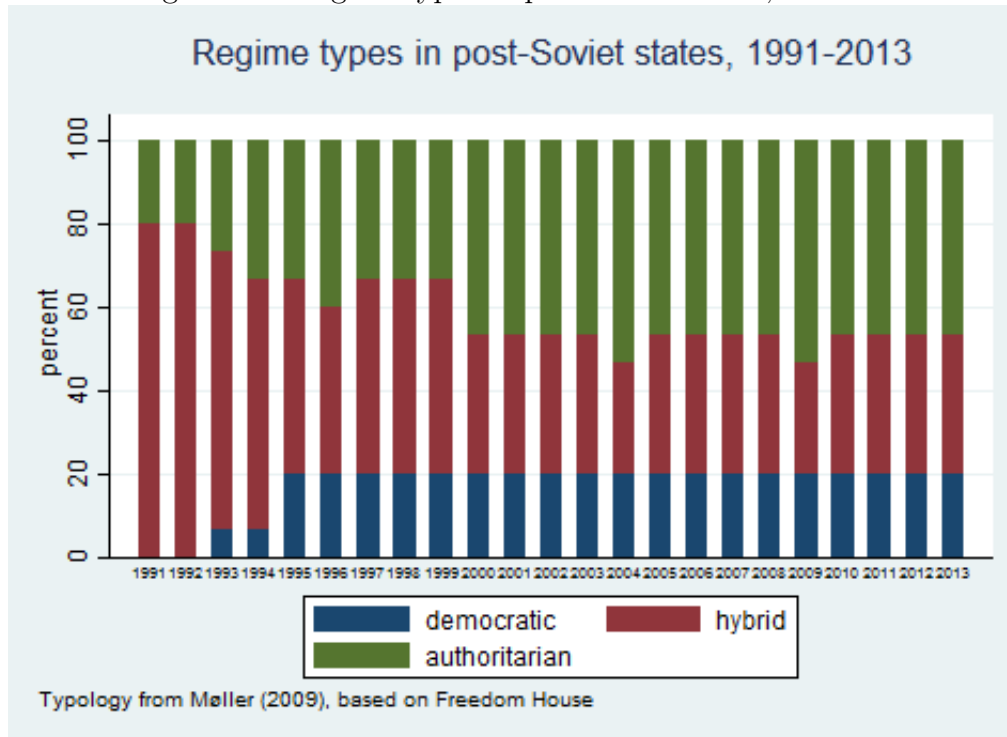
Where N_g is the number of cross-sectional units and the order of the correlation matrix, and r_{ij}^2 it the ij th residual correlation coefficient. The test statistic is χ distributed with $DF = N_g(N_g - 1)/2$ under the H_0 of cross-sectional independence. Cross-sectional dependence primarily concerns analysis of panel data with long time series, whether the post-Soviet time span could be described as long or not, testing for such dependence is a necessity. If the number of time periods T is large relative to the number of cross-sectional units N Huyos and Sarafidis (2006) recommends using the

Lagrange multiplier test developed by Breusch and Pagan (1980), but these findings does not rule out other tests for purposes of reliability. With low T the Breusch-Pagan statistic suffers from size distortion. As $T = 23$ and $N = 15$ giving $T > N$ the LM test fits the data dimensions and is the first choice for diagnostics of the given data.

4.7 Summary

In this chapter the research design have been laid out. Next, the results of my analysis are presented.

Figure 5.1: Regime types in post-Soviet states, 1991-2013



5 Results

Testing the hypotheses regarding the relationship of state capacity and democracy I first test hypothesis 1a and 1b, before hypothesis 2 are investigated. In figure 5.1 the development of regime types as classified by Møller (2009) are presented. It is clear that there have been substantial changes in regime types over the last 24 years. Countries being classified as democratic developed in the early years of transition and has remained stable throughout the period. For authoritarian countries the tendency is shift away from clear authoritarian polities towards hybrid and democratic polities. The tendency are, however, not as stable as the apparent early consolidation of democratic regimes.

5.1 Hypotheses

5.1.1 State capacity and democracy

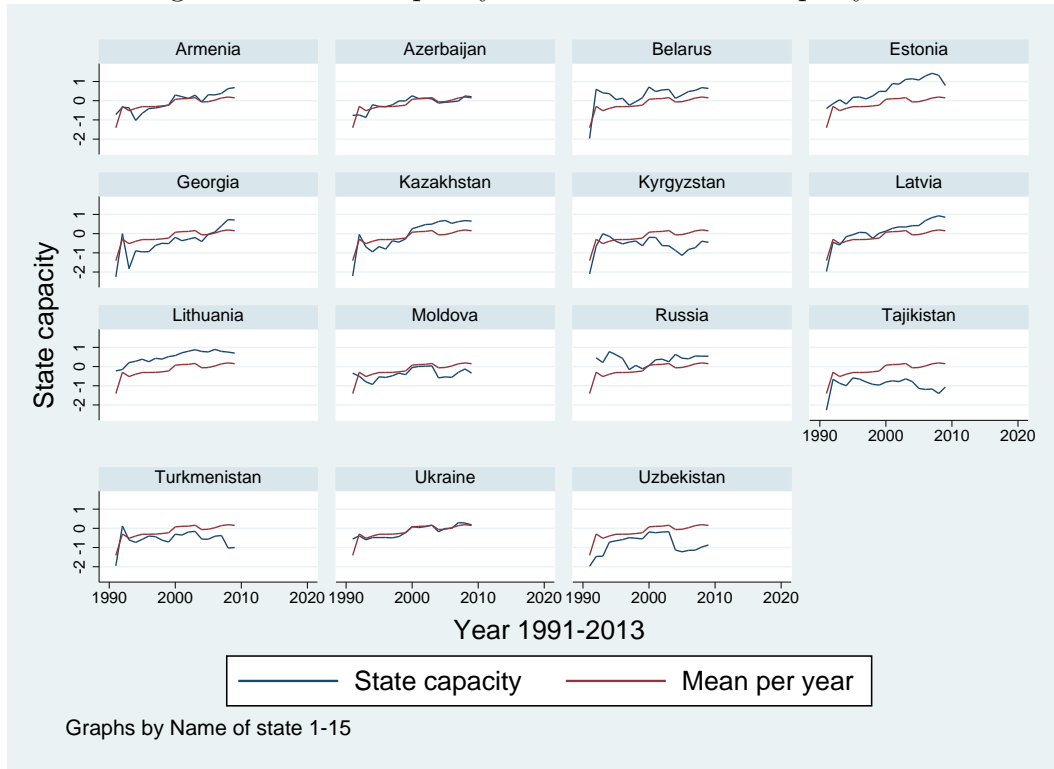
Beginning this inquiry, I test two hypothesis of the directional effect of state capacity on democracy.

Hypothesis 1a: *Increases in state capacity leads to increased levels of democracy.*

Hypothesis 1b: *Increases in state capacity leads to reduced levels of democracy.*

These are the main hypothesis of my thesis and, I believe, the theoretically most interesting. Supporting or rejecting these hypothesis will shed light not only on the development following the dissolution of the Soviet Union, but also on the broader discussion of the state capacity concept. As seen in figure 5.2 over state capacity variable the trajectories of state capacity as defined in Møller (2009) are defined by clear trends in different countries. For Kyrgyzstan, Tajikistan, and Turkmenistan state capacity increases drastically in the early stages of the post collapse state-building process, before the trend turns and state capacity decreases incrementally over the subsequent years. Increased state capacity are found both with drastic early year changes in Belarus, Georgia, Kazakhstan, and Latvia, and without such early variability in Armenia, Azerbaijan, Estonia, Lithuania, and Ukraine. In Moldova and Russia no clear trend stands out, while Uzbekistan experienced increases

Figure 5.2: State capacity over time with mean per year



in state capacity during the early 1990s and a rapid decline between 2003 and 2004, possibly a reflection of the governments inability to prevent the violence from islamist separatists in 2004 and the intrastate violence the following year.

Testing the difference between levels of capacity in different regime types by a multivariate test of means (Table 5.1) allowing the covariance matrix to change between countries to account for problems caused by heterogeneity gives the following results. Democratic country-years on average have a higher level of state capacity than hybrid and authoritarian country-years. A Wald test reveals that the three regime types are extremely unlikely to have

Table 5.1: Comparison of mean capacity by regime type
Descriptive statistics

Regime type	Mean	Std
Democratic	0.425	0.533
Hybrid	-0.270	0.634
Authoritarian	-0.426	0.544

$H_0 = \text{Democratic}=\text{Hybrid}=\text{Authoritarian}$		
Wald χ^2	89.64	
Prob > χ^2	0.0000	(χ^2 approximation)
Prob > χ^2	0.0000	(James' approximation)

$H_0 = \text{Hybrid}=\text{Authoritarian}$		
MNV F(1,130.5)	3.40	(Modified Nel and Van der Merve)
Prob > F	0.0675	

the same level of capacity (with $p=0.0000$). It is also revealed that the difference between hybrid and authoritarian country-years can be presumed to be significant with $p=0.0675$. The correlation between capacity and regime type is $R = -0.411$ with $p = 0.000$, indicating a change in capacity by one standard deviation yields a change of 0.4 of regime type towards democracy. The range between mean democratic and mean authoritarian state capacity are 0.851 standard deviations, a substantial proportion of the total range of 3.7. The between-subject variability in the data indicate a positive relationship between state capacity and democracy.

Progressing to within-subject variability, table 5.2 show the result of similar analyses done for observations in 1993, 2000, and 2007. In the descriptive table there appears to be a positive trend in the level of state capacity from a mean of -0.051 in 1993 to a mean of 0.141 in 2007. However, with a to-

Table 5.2: Comparison of mean capacity by year
Descriptive statistics

Regime type	Mean	Std
1993	-0.051	0.625
2000	0.074	0.386
2007	0.141	0.749
$H_0 = 1993=2000=2007$		
Wald χ^2	10.96	
Prob > χ^2	0.0042	(χ^2 approximation)
Prob > χ^2	0.0105	(James' approximation)
$H_0 = 1993=2007$		
MNV F(1,130.5)	6.87	(Modified Nel and Van der Merve)
Prob > F	0.0142	

tal observational range of 3.7, the increase from 1993 to 2007 of 0.192 of a standard deviation does not seem substantial. Finding an increase in state capacity over time is hardly surprising. States consolidate over time and as political institutions gain legitimacy, routines are institutionalized, experience of the state apparatus increases, and the state fully penetrate society, higher capacity measures are expected. What is surprising is the relatively modest increase observed.

Concluding the preliminary analysis of the relationship between state capacity and democracy in post-Soviet states, the apparent prevalence of between-subject variation and the minor within-subject variation must be noted. Continuing the study, it is necessary to regress democracy on state capacity and to bring control variables into the analysis. I begin with a pooled ordinary least squares estimation, ignoring country clustering and

Table 5.3: Pooled OLS

Capacity	Fiscal freedom	GDP pr. cap	Gini income	Oil exports	Constant
-12.901**	-0.068	0.0001	-0.264	0.006	33.619
(5.048)	(0.061)	(0.0007)	(0.480)	(0.005)	(21.206)
N	270				
$p > F$	0.0008				

time structures. The pooled results are presented in table 5.5 and displayed graphically together with individual β linear fits for each country in figure 5.3. Capacity are significant at the 0.05 level and β are strongly negative at -12.901 indicating a very large shift towards democracy by one standard deviation shift in capacity. Conducting such analysis appear to yield clear results, but as country-year units are heterogeneous and unobserved time-invariant effects are likely to covary with both dependent and independent variables, estimates will be biased.

Continuing to analyse the effect of state capacity on the levels of democracy I use a fixed effects model of the relationship. Such model removes time-invariant effects by first differencing, thus reducing the necessary control variables considerably. The model are begun as a simple bivariate model, before some relevant control variables are introduced. Standard errors are clustered by country as heteroskedasticity are present (Wald-test gives $p = 0.000$). I argued for the use of fixed effects in the research design. A robust Hausman test indicates with $p = 0.0000$ for all imputed datasets inconsistent estimates in the random effects model, supporting the earlier argumentation. In table 5.4 the result of the fixed effects models analysis are listed.

Table 5.4: Fixed effect model of democracy on capacity

	(1)	(2)	(3)	(4)	(5)
Capacity	-1.328 (1.027)	-1.483 (1.237)	0.086 (1.349)	-0.410 (1.142)	-1.308 (1.294)
GDP pr. cap.		0.00006 (0.000)	-0.00012 (0.000)		-0.00006 (0.000)
Urban pop. (%)			1.732* (0.953)	1.739* (0.962)	
Fiscal freedom					0.045 (0.081)
Gini income			-0.317 (0.209)	-0.294 (0.219)	-0.292 (0.197)
Oil exports				0.001 (0.002)	0.000 (0.002)
Constant	21.984*** (0.100)	21.566*** (1.950)	-62.338 (52.798)	-64.437 (53.936)	29.269** (9.966)
Obs.	270	270	270	270	270
$p > F$	0.219	0.447	0.215	0.190	0.179
σ_U	14.431	14.469	35.746	35.867	14.536
σ_E	5.037	5.045	4.646	4.640	4.913
rho	0.891	0.891	0.983	0.983	0.897
Power ($p = 0.1$)	0.35	0.43	0.05	0.10	0.26
N-demand ($P = 80\%$)	1010	762	225656	9929	1623

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Country clustered standard errors in parenthesis.

The bivariate model (1) reveals as expected a negative coefficient for capacity, but with $p = 0.220$ $H_0 = \beta = 0$ cannot be rejected. As we shall see are all models plagued by large standard errors and lacking significance. Ignoring the high p-value, the coefficient size indicates that a state capacity increase of 1 standard deviation on average reduces the multiplied Freedom Index, which ranges from 1 to 49, by 1.328. For model 1 the probability of significant results for capacity at $p = 0.1$ are 35% if repeated over time and the necessary number of units for $p = 0.1$ given the norm power of 80% are 1010. The relatively modest coefficient size combined with lacking significance leads to a weakening of the proposed hypothesis. However, control variables must be used to avoid omitted variable bias. Introducing GDP as a control for socio-economic modernization (Model 2) does not change the findings from model 1 substantially. GDP per. capita are itself not significant but the coefficient for state capacity increased. A change in the power analysis indicates increased power, although 43% are still too low, and a reduced demand for N .

Model 3 incorporates percentage of urban population to control for class based contributors to democracy, gini as an indicator of inequality, and a measure of resource dependence. The coefficient of capacity changes to a positive sign and the effect size are severely diminished. Still the estimate are non-significant. Underlining the small coefficient size are the power analysis indication a power of 5% and the need for 225656 units to achieve significant results. Gini effects are neither significant nor large, a change from complete equality to complete inequality leads to a reduction in the multiplied Freedom

Index by 0.317. Our first significant coefficient are for the effect of settlement patterns. The effects are substantial as a 1% increase in urbanity are associated with a 1.732 increase of the regime index. However, the direction of the effect are a surprise. Theoretical contributions of class-based theories suggests a increase in urbanity leads to a increase in levels of democracy, but these findings suggest a reversed relationship.

Dropping GDP and including oil exports in model 4 does not yield significant findings in the added variables or for state capacity. Estimates for urbanity remains virtually the same, but performing a variance inflation analysis indicates a VIF of 231.90 making if necessary to remove it from the model. State capacity are now again negative, but with the coefficient -0.41 effects are still small. Power are found to be a low 10% for $p = 0.1$ with required N for $p = 0.1$ are 9929. Oil exports are positive but not significant. Lastly, model 5 includes GDP, Gini, and oil exports, as well as a measure of fiscal freedom to control for economic liberalization. Capacity estimates return to the same level as in models 1 and 2. All included variables are in this model insignificant. Statistical power are at 26% and required N for $p = 0.1$ are 1623.

Seeing as the results in table 5.4 are plagued by the lack of statistical significance, some explanations of the insignificant results should be mentioned. First, the effect of state capacity on democracy over time may simply be non existent or very weak in the post-Soviet context. Should other causes such as elite actions in early-phase transition be the primary determinant of

regime trajectories, or should the covariance be primarily between-subjects rather than within-subject, finding non-significant results are not surprising. Second, as coefficients are the average effect of a variable on democracy for all countries, insignificant coefficients may imply regional or country-wise differentiation of the direction and strength in a relationship. Should the association between capacity and regime be positive in some countries and negative in others, insignificant results may arise. Third, lack of statistical power due to small N could result in the inability to detect a true phenomenon.

Finding inconclusive tendencies of the effect of state capacity on democracy are done twofold. First, an interaction between capacity and region are performed to reveal tendencies within regions. Second, an interaction between state capacity and the id-variable country1. The results are presented in table 5.5.

The results demonstrate the inconsistency of the regime-capacity relationship in post-Soviet states. Model 1 includes only the interaction terms with significant results for the Baltic, East-Central European, and Russian countries. For the Baltic and East-Central European countries state capacity have positive effect on the levels of democracy. For the Baltics one standard deviation increase in state capacity by 3.6 towards democracy. For East-Central Europe the change are 4.347 towards democracy. The contrary trend can be found for Russia where one standard deviations increase in capacity reduces democracy by 6.351 points. Including control variables makes the

Table 5.5: Interaction terms for state capacity

	Region			Country	
	(1)	(2)		(3)	(4)
Capacity:			Capacity:		
<i>Baltic states</i>	-3.600*** (0.398)	-3.419 (2.333)	<i>Armenia</i>	5.238*** (0.000)	4.503** (1.469)
<i>Central Asia</i>	-0.064 (1.456)	0.668 (1.932)	<i>Azerbaijan</i>	-2.217*** (0.000)	-7.852* (3.958)
<i>East-Central Europe</i>	-4.347* (2.251)	-6.025*** (1.391)	<i>Belarus</i>	-0.567*** (0.000)	-0.567 (4.982)
<i>Russia</i>	6.351*** (0.000)	6.932*** (2.167)	<i>Estonia</i>	-3.120*** (0.000)	-3.085 (2.336)
<i>Southern Caucasus</i>	-0.542 (2.449)	-1.220 (2.264)	<i>Georgia</i>	-3.283*** (0.000)	-2.974* (1.426)
			<i>Kazakhstan</i>	0.854*** (0.000)	-0.160 (2.336)
			<i>Kyrgyzstan</i>	-2.502*** (0.000)	2.851 (3.022)
			<i>Latvia</i>	-4.442*** (0.000)	-1.594 (2.953)
			<i>Lithuania</i>	-3.317*** (0.000)	-1.022 (5.565)
			<i>Moldova</i>	-9.417*** (0.000)	-9.371*** (1.121)
			<i>Russia</i>	6.351*** (0.000)	7.775*** (2.485)
			<i>Tajikistan</i>	14.153*** (0.000)	16.160*** (3.172)
			<i>Turkmenistan</i>	-3.171*** (0.000)	-4.036 (1.759)
			<i>Ukraine</i>	-3.872*** (0.000)	-7.032*** (2.207)
			<i>Uzbekistan</i>	-3.266*** (0.000)	-1.706 (1.528)
GDP pr. cap.		0.00005 (.0002)	GDP pr. cap.		-0.0002 (0.0003)
Fiscal freedom		0.062 (0.084)	Fiscal freedom		0.083 (0.089)
Gini income		-0.300 (0.203)	Gini income		-0.316 (0.220)
Oil exports		-0.0005 (0.002)	Oil exports		0.0005 (0.003)
Constant	22.222*** (0.267)	28.329** (10.404)	Constant	22.405*** (0.000)	28.926** (10.715)
Obs.	270	270		270	270
$p > F$	0.000	0.000		.	.
σ_U	14.567	15.106		15.423	15.840
σ_E	5.004	4.859		4.910	15.840
rho	0.894	0.906		0.907	0.917

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Country clustered standard errors in parenthesis.

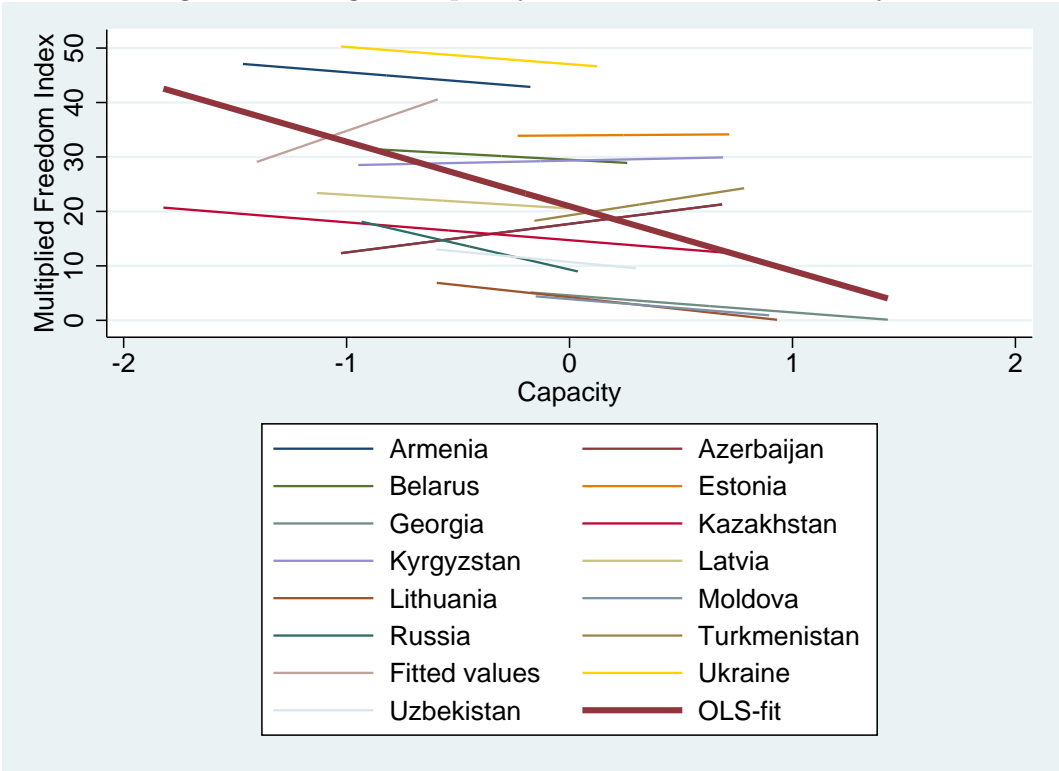
interaction for the Baltic states insignificant and increases the significance for East-Central Europe to $p = 0.000$. Effect directions remain the same.

The country specific interaction terms in model 3 are naturally all highly significant with standard errors of 0. Here are also the inconsistency of the hypothesized relationship evident. For Armenia, Kazakhstan, Russia, and Tajikistan higher levels of state capacity reduces the level of democracy. For Kazakhstan the effect size are very small ($\beta = 0.854$), but for the three other countries effects are substantial. Particularly for Tajikistan the effect are large with $\beta = 14.153$. Coefficients for the remaining countries are, as expected, negative. Effect sizes vary between $\beta = 2$ and $\beta = 4.5$ with the exception of belarus at only $\beta = 0.567$. Model 4 includes controls, none of which are significant at any level. Some interaction estimates are insignificant. For significant estimates the effect direction vary with three indicating a reduction of democracy by a increase in capacity and four indicate a increase of democracy due to state capacity.

In figure 5.3 lines are fitted for the multiplied Freedom Index on state capacity for each country. Here we clearly see the divergent associations in the post-Soviet states. As no clear tendency for all countries appear, any attempt to estimate a common β -coefficient for the 15 states is likely to result in insignificant results. The graph also reveals how a pooled OLS model would estimate a clear trend supporting the theoretical assumptions of hypothesis 1.

Resonating the findings in the initial multivariate mean comparisons I

Figure 5.3: Regime-capacity linear fit for each country



perform a between effects analysis on the same models fixed effects were performed. This excludes all time-variance and compares level differences of the 15 countries. As time-invariant controls inclusion in the Soviet Union by armed occupation and whether initial elections were won by sitting political elites or oppositional forces are included. Results are presented in table 5.6. A clear difference from the fixed effects estimations are apparent. When comparing between-variation only, state capacity are significantly associated with levels of democracy. In model 4 the effect of capacity indicates a one standard deviation change in capacity leads to a 51 point reduction in regime on a scale from 1 to 49. As testing for multicollinearity are not feasible for between effects, the occupation variable covary highly with the multiplied Freedom Index and GDP indicating the abnormal result could be caused by multicollinearity. However, removing it from the model renders state capacity insignificant. The model results confirm the findings of mean comparison. Countries with higher levels of state capacity in general also have higher levels of democracy.

Table 5.6: Between effects analysis

	(1)	(2)	(3)	(4)
Capacity	-19.412** (6.953)	-35.246** (13.543)	-34.164** (13.866)	-51.940*** (13.230)
GDP. pr. cap.		0.002 (0.001)	0.002 (0.001)	0.006** (0.001)
Fiscal freedom				-0.182 (0.239)
Gini income				-0.960 (0.787)
Oil exports			0.007 (0.016)	-0.009 (0.012)
Occupation				-41.178** (11.5442)
Initial election				14.444 (8.925)
Constant	20.210*** (3.209)	3.185 (13.006)	3.346 (13.247)	22.240 (22.823)
$p > F$	0.0170	0.0293	0.0630	0.0263

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Country clustered standard errors in parenthesis.

5.1.2 A J-shaped relationship

Hypothesis 2: *High and low scores on democracy are associated with high state capacity, median scores on democracy are associated with low capacity.*

In analysing the shape of the relationship between state capacity and regime types I relax the linearity assumption of traditional approaches and model a non-linear fit of the data. Studying the deviation from linearity may reveal important aspects of the phenomena otherwise secluded by the forced linearity of common regression techniques. As quadratic functions only can open up either upwards or downwards a measure of regime type must comprise the x-axis.

The non-linear modelled relationship between state capacity and regime type is shown in table 5.6. As the coefficient a (with democracy squared) is positive, the graph of the bivariate function opens up upwards, that is, the vertex of the non-linear relationship is its lowest value. As a is close to 0 on a scale 0 to 10 the curve is open, increasing slowly over the values of X . This indicates higher and lower values of regime type to be associated with higher state capacity, while median values of regime type is associated with lower state capacity. While this differentiation of estimated state capacity for values of regime type is significantly present in that all coefficients are significant at the 0.01 level, the degree of differentiation is relatively low and the curve may not be increasing enough to indicate a J-shaped relationship.

Table 5.7: Non-linear regression of state capacity on regime type

a	b	c	R^2	Adj R^2
0.041*** (0.011)	-0.508*** (0.092)	1.125*** (0.174)	0.2378	0.2324

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Std. Err. in parenthesis.

Table 5.8: Non-linear regression excluding 1991

a	b	c	R^2	Adj R^2
0.029** (0.009)	-0.403*** (0.080)	1.012*** (0.151)	0.2819	0.2765

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Std. Err. in parenthesis.

Inspecting the graphic representation in figure 5.4 reveals some outliers with low values of state capacity possibly affecting the fitted curve. The country years affected are the Central-Asian countries, Georgia, Latvia, and Belarus in 1991. Removing these observations from the regression are justifiable as 1991 were a year of chaos in the post-Soviet sphere, countries were barely formed resulting in overly weak capacity and a lack of reliable data which may affect the capacity measure for early years. The removal of 1991 observations in its entirety yields results converging on linearity. As seen in table 5.8 a , though not significant, indicates a very flat curve with about three quarters of the rate of decrease as the model including 1991 observations.

As modelling a non-linear relationship between variables depend on assuming the empirical relationship to be non-linear, I will test the necessity of modelling non-linearity by comparing the previous model with a linear model of the same relationship. A visual inspection of figure 5.4 including

Figure 5.4: Linear and non-linear fit

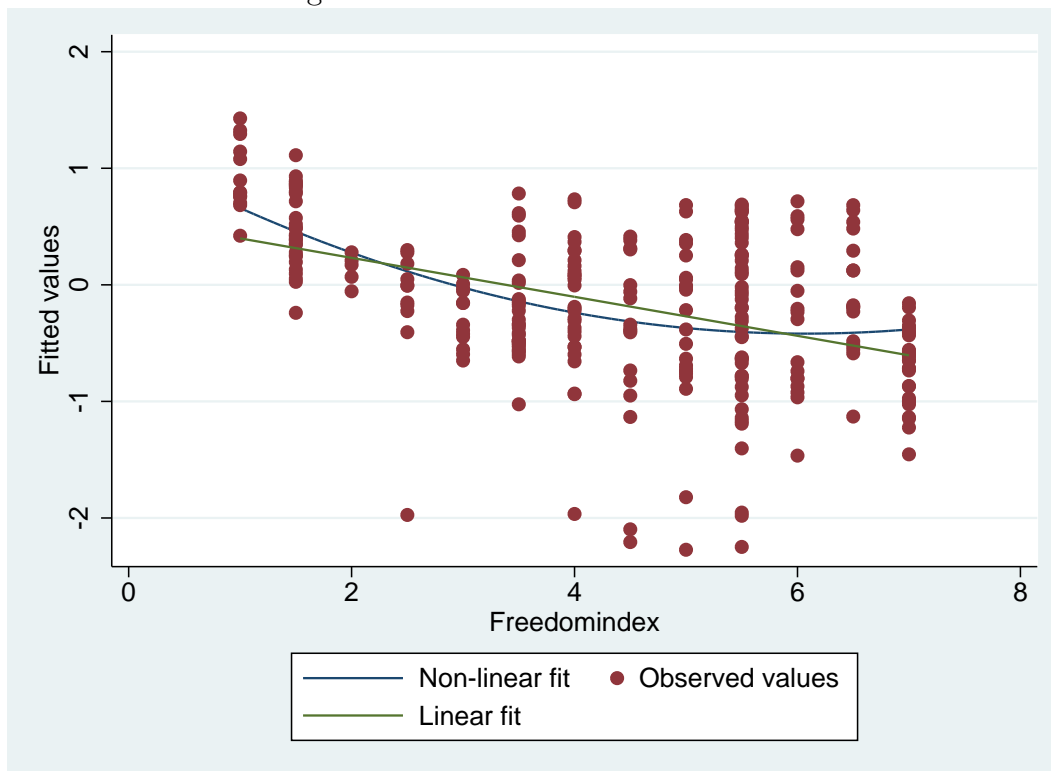


Table 5.9: Comparison test statistics

	R^2	Akaike IC	Root MSE	Mallow's Cp
Non-linear	0.2378	504.3357	0.584	-.891
Linear	0.1993	516.3278	0.598	.10614525

the linear fit for the data indicates a relatively large overlap of the two fitted lines. There certainly does not appear to be a clear J-shaped relationship in the data. For the largest body of observations the lines coincide, this is particularly evident if the 1991 observations (with capacity -2) is removed. Inspecting different statistics for the comparison of the two models is necessary to avoid the pitfalls of visual data inspection.

R^2 indicates that the non-linear model explains roughly 21% more of

the variance in the data than does the linear model. As this measure is inadequate for non-linear data (Spiess and Neumeyer 2010) other measures should be considered. The Akaike information criterion indicates the linear model wastes more information than the non-linear model, and the root mean squared error holds the non-linear model to be the best of the two at predicting values. As the Mallow's Cp statistic for the linear model is closer to the number of independent variables plus the constant ($2 - (-0.891) = 2.891$ and $2 - 0.106 = 1.894$) the linear model is assumed to be the most precise predictor of the two. As these measures are not unanimous and the plotted linear and non-linear lines appear to overlap there appears not to be a particularly non-linear trend in the data.

Inspecting the residuals of the two models can shed light on the differences between the models. When plotting residuals as in figure 5.5-7 on fitted values, dependent variable, and independent variable for both models, the residual characteristics appear to be very similar. This indicates, as does the proximity and irregular test statistics, that the models are relatively similar. From this one can conclude that for the states formerly comprising the Soviet Union, the assumption of a J-shaped relationship between regime type and state capacity of Bäck and Hadenius (2008) does not apply. Any deviation between the linear and non-linear models is not sufficient (1) to be theoretically significant and (2) to prefer a curved model over the more parsimonious and general linear model.

Not finding a J-shaped tendency in the data, I perform non-linear regres-

sion analyses on sub-samples¹ of the dataset as seen in table 5.10 and 5.11. Grounding the analysis in the regional divides of the former Soviet Union facilitates differentiating the hypothesis test and the revealing of regional differences. As such regional differentiating suffers from small sample sizes, as seen by the significance of coefficients, some of these estimates cannot be trusted. However, for both Russia and East-Central Europe, all coefficients are statistically significant and higher levels of state capacity is associated with both higher and lower values of regime type. In Russia, all predicted country-years fall within the 'hybrid regime' category² while for the East-Central European countries predicted values are both hybrid and authoritarian. The effect of moving towards extreme values on 'freedomindex' for these two regions is substantial as the difference between the highest and lowest predicted values are 0.801 standard deviations for Russia and 0.892 standard deviations for Moldova, Ukraine, and Belarus. As there are great differences in the shape of the relationship and the significance of coefficients across regions, the post-Soviet territory as a whole does not support the hypothesis of a J-shaped relationship. But for two individual regions a non-linear J-shaped relationship is present.

¹Baltic states: Estonia, Latvia, Lithuania. Central Asia: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan. East-Central Europe: Belarus, Moldova, Ukraine. Russia: Russia. Southern Caucasus: Armenia, Azerbaijan, Georgia.

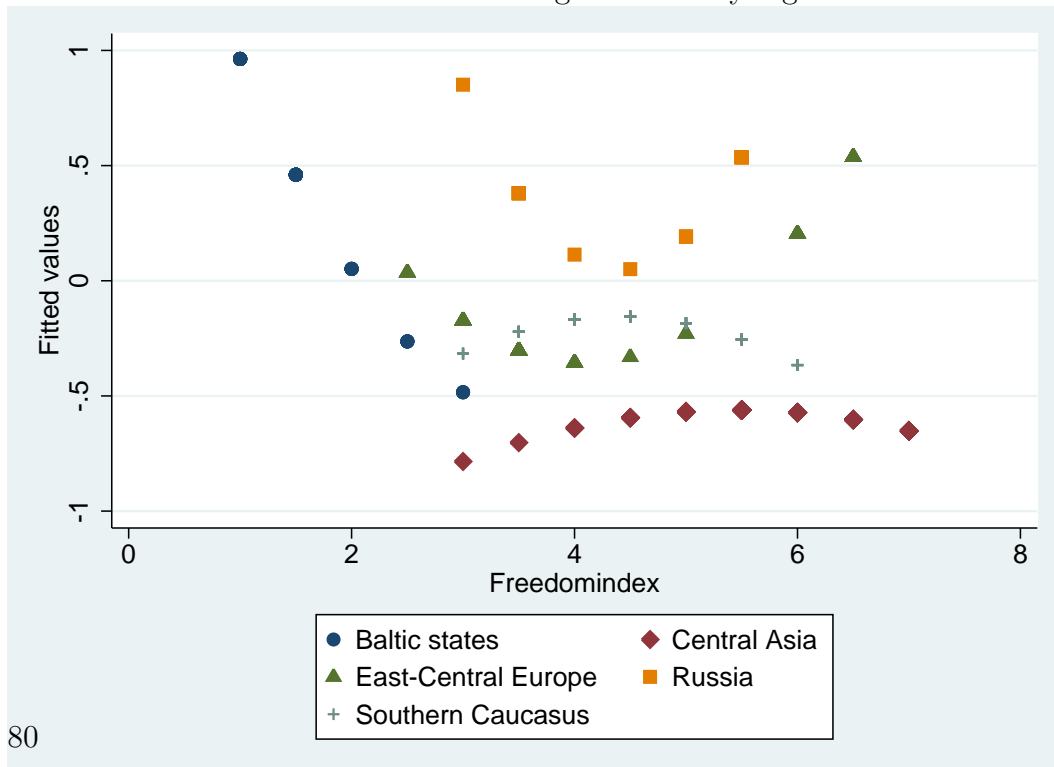
²In Møller (2009) defined as ≥ 2 and ≤ 5.5 .

Table 5.10: Non-linear regression by region

	a	b	c	R^2	Adj R^2
1 Baltic states	0.188 (0.139)	-1.475*** (0.546)	2.250*** (0.487)	0.5832	0.5678
2 Central Asia	-0.037 (0.055)	0.406 (0.631)	-1.668 (1.756)	0.0054	-0.0163
3 East-Central Europe	0.154*** (0.040)	-1.256*** (0.376)	2.233*** (0.815)	0.3519	0.3353
4 Russia	0.408*** (0.136)	-3.593*** (1.219)	7.960*** (2.638)	0.3960	0.3155
5 Southern Caucasus	-0.082 (0.121)	0.726 (1.116)	-1.751 (2.504)	0.0101	-0.0266

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Std. Err. in parenthesis.

Table 5.11: Non-linear regression fit by region



Naturally, these previous results suffer from ignoring country clustering and time structure, leading to inconsistent estimates if omitted variables are correlated with the dependent and independent variables and inefficient estimates if group-wise heterogeneity is present. Both of these assumptions are often violated in panel data and difficult to correct for in non-linear models. To overcome these challenges, I model fixed effects with regime type as a factor variable, thereby enabling differentiating the effects of democratic, hybrid, and authoritarian regimes on state capacity. The inclusion of control variables and the inherent control of time-constant effects gives these findings greater validity than the previous models. As the developmental trajectories of the post-socialist world in large part are determined by deep, structural, and historical factors (Kitschelt 2003) not easily susceptible to change, and capacity and regime type are deep and slow-changing characteristics of the state (Møller and Skaaning 2011a), the need for control variables are limited. The inclusion of GDP, Gini, fiscal freedom, and oil exports controls for some relevant time-varying factors and reduces the risk of omitted-variable bias. Regression results are shown in table 5.12. None of the three interaction coefficients are significantly different from zero, supporting the previous conclusions of no substantial curved relationship.

5.2 Summary

Finding no significant tendency for changes in capacity to be associated with changes in democracy for all the fifteen countries, hypotheses 1a and 1b

Table 5.12: Fixed effects model of level-differences in regime type

Capacity:	
<i>Democ.</i>	-4.193 (3.429)
<i>Hybrid</i>	-3.988 (2.374)
<i>Autho.</i>	0.005 (1.906)
GDP pr. cap.	0.00003 (0.0003)
Fiscal freedom	0.055 (0.072)
Gini income	-0.288 (0.199)
Oil exports	-0.0002 (0.002)
Constant	27.933** (9.365)
Obs.	270
$p > F$	0.0013
σ_u	13.890
σ_e	4.853
rho	0.891

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ Std. Err. in parenthesis.

cannot be confirmed. However, there appears to be great variation in both direction and strength of the relationship when interacting capacity with regions and countries respectively. There are also a general tendency for countries with higher levels of capacity to also have higher levels of democracy. As a non-linear relationship may render linear analysis insignificant, a polynomial model were also tested. This model found no substantial deviation between the linear and non-linear models. Also here country-wise variation were found.

Figure 5.5: Residuals on fitted values

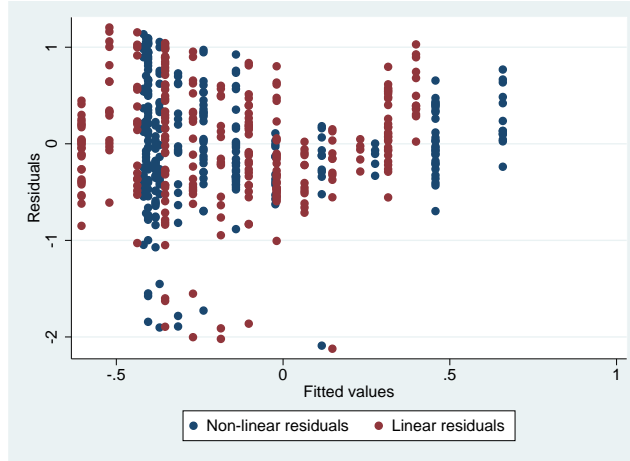


Figure 5.6: Residuals on state capacity

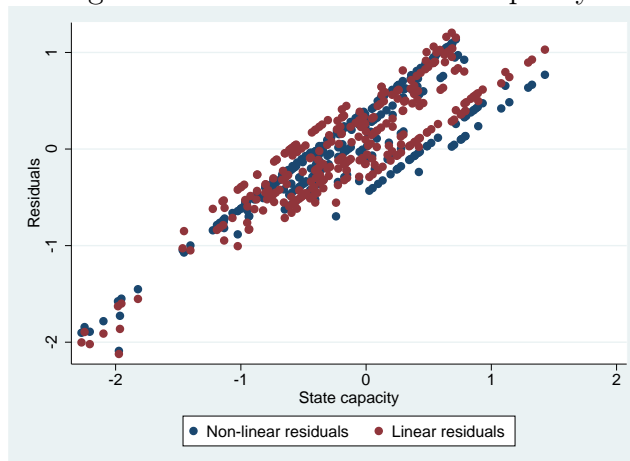
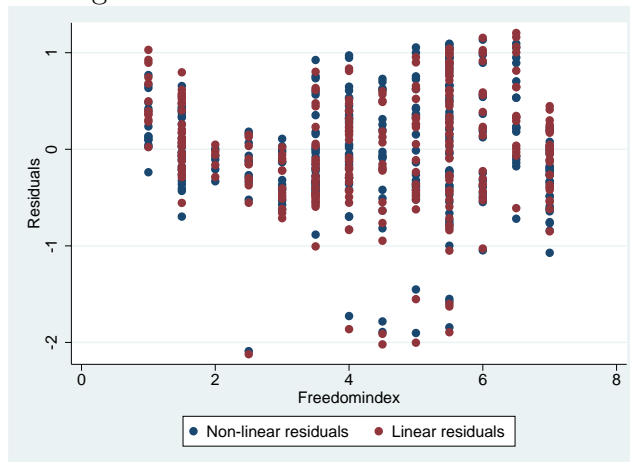


Figure 5.7: Residuals on freedomindex



6 Diagnostics, robustness, and alternative measurement and estimators

To validate my findings the assumptions of the previous analyses must be checked. Furthermore, alternative dependent and main independent variables are modelled.

6.1 Model diagnostics

6.1.1 Influential observations

Outlying observations can, given both unusual values on both X and Y, influence the estimates of a model. As extreme time-year observations are absorbed by subject specific parameters in fixed effects analysis, the effect of excluding entire subjects are of greater importance than the effect of excluding singular observations such as done with Cook's D (Banerjee and Frees 1997; Frees 2004). Comparing the effect of excluding countries the model including oil exports, fiscal freedom, Gini, and GDP are performed with one country excluded and the Capacity coefficient and the mean square error of the predicted values with and without the particular country are reported. Mean square error are used as AIC cannot be calculated with imputed data. As demonstrated in table 6.a there are variation in the β -coefficient for state capacity, however, they are all negative and insignificant. Studying the performance as measured by the mean square errors, no model appears to stand out from the others regarding predictive power. Consequently, influential countries does not seem to affect the direction, strength, or efficiency of es-

Table 6.1: Subject level exclusion prediction coparison

Country	Coef.	Mean square error	Country	Coef.	Mean square error
ARM	-1.891 (1.231)	0.81	LTU	-1.282 (1.315)	0.83
AZE	-1.065 (1.525)	0.83	MDA	-0.995 (1.341)	0.83
BLR	-1.104 (1.247)	0.79	RUS	-0.805 (1.349)	0.83
EST	-1.080 (1.316)	0.85	TJK	-2.065 (1.150)	0.82
GEO	-0.995 (1.443)	0.84	TKM	-1.164 (1.418)	0.85
KAZ	-1.706 (1.384)	0.83	UKR	-1.228 (1.406)	0.85
KGZ	-1.761 (1.282)	0.82	UZB	-1.039 (1.506)	0.84
LAT	-1.258 (1.297)	0.84			

timates.

6.1.2 Multicollinearity

Should independent variables be highly correlated the variance of estimates may be excessively inflated. Multicollinearity problems thus cause negatively biased significance levels when present. Estimating the variance inflation factor of the variables in the models are done through the country dummy variable estimation of fixed effects. The percentage of the population living in urban areas clearly stands out and for model 4 in table 5.4 with a variance inflation factor or 231.90, well above any common thresholds of 5-10 (O'brien 2007). As such the variable were dropped from the analysis.

6.1.3 Non-stationarity

Time trends are stationary when the joint probability distribution are constant through time. Should non-stationarity be present external shocks to the data will cause a permanent shift in the probability distribution and the data will not, over time, return to its original trend (Breitung and Das 2005). This may cause both lack of efficiency and severe bias in estimates. To control for non-stationarity I preform a Fisher unit-root test (Choi 2001) on the multiplied Freedom Index and the measure of state capacity. The test are preformed on the demeaned variables to avoid distorting the statistic due to cross-sectional correlation. Testing $H_0 =$ all panels contain unit root, the test reports for state capacity $Inv - \chi^2 = 59.638$ with $p = 0.001$ and for the multiplied freedom index $Inv - \chi^2 = 146.8285$ and $p = 0.0000$. As at least one panel are stationary transforming the central variables are not necessary.

6.1.4 Residuals diagnostics

Heterogeneity in residuals may invalidate statistical tests as estimated variances may be biased. For panel data analysis particularly groupwise heteroskedasticity is a challenge. Testing the difference of variance across countries by a modified Wald test I found heteroskedasticity for most models with p-values varying close to $p = 0.0000$. This is no surprise as heteroskedasticity are prevalent in non randomly sampled comparative political data (Baum 2001). A country clustered variance-covariance matrix are used to correct any bias.

Following the adjustment for model 4 with GDP, Gini, oil exports, and fiscal freedom as controls the residuals appear to be reasonably compliant with the assumptions of ϵ_{it} . For the main body of observations the variance of the residuals plotted in figure 6.1-3 appears to be approximately equal across the fitted values. For the same model the residuals are not normally distributed, but rather skewed towards low values as demonstrated in figure 6.4. This is supported by a Shapiro-Wilkes test giving $p = 0.0000$ for H_0 of normality. Capacity also have $p = 0.0000$ but visually resembles normality, while the modified Freedom Index are very evenly distributed with no apparent top points. A transformation could improve the normality of the residuals, but no available transformations are beneficial for the dependent variable. As no transformation are possible, the analysis depend on the non-normality not completely invalidating hypothesis testing. For the between effects analysis the model are approximately normally distributed as seen in figure 6.5.

Testing for autocorrelation and cross-sectional dependence are done for each imputed dataset. There are indications for both when testing, but as clustered standard errors already are used additional robust variance estimation cannot be used. Hopefully the clustered standard errors prevent additional efficiency loss.

6.2 Alternative model specification

Any attempt at measuring abstract social concepts are caught in a game in which a choice of conceptualization and measurement must be made, but

where no correct choice exists. Coping with this Sisyphean task choices and trade-offs must be weighted to find an acceptable approach, but alternative ways towards a similar target are always available and many times equally valid (Gerring 1999; Adcock and Collier 2001). Analysing the proposed model with different conceptual and operational procedures may shed some light on the validity of my findings. Alternative specifications of the dependent variable are applied before alternative specifications of state capacity are tried out.

6.2.1 Dependent variable

Building on Robert A. Dahls concept of polyarchy I used the Freedom House index modified by aggregating the two dimensions by multiplication to deny compensability. Several alternative approaches to measuring the concept of democracy are available. First, I will use the unmodified Freedom House (FHI) index (Freedom House 2014a) where the dimensions 'political rights' and 'civil liberties' are aggregated through arithmetic mean. This procedure are the most commonly used aggregation of the Freedom House index. Second, the variable polity2 from the Polity IV (P2) dataset (Marshall, Gurr, and Jaggers n.d.) are used. Together with FHI Polity IV are the most common continuous measures of democracy. FHmod are the modified FHI used in my analysis. Clearly none of the two alternative regime measures in table 6.2 are significant. Both the Freedom House index and the Polity IV measure give, as does the modified Freedom Index, a negative coefficient. However, as estimates are insignificant no clear conclusion on their real value can be made. Matching the modified democracy measure, the two alternative

Table 6.2: Alternative 'democracy' results

	FHI	P2	FHmod
Capacity	-0.208 (0.148)	-0.218 (0.541)	-1.308 (1.294)
GDP pr. cap.	-0.00004 (0.00003)	0.0001 (0.0001)	-.00006 (0.0002)
Fiscal freedom	0.004 (0.008)	-0.013 (0.039)	0.045 (0.081)
Gini income	-0.034 (0.020)	0.007 (0.047)	-0.292 (0.197)
Oil exports	0.0001 (0.0002)	-0.0004 (0.0007)	0.0004 (0.002)
Constant	5.539*** (1.037)	0.793 (2.623)	29.269** (9.966)
$p > F$	0.0507	0.8708	0.1795
σ_u	1.661	6.592	14.536
σ_e	0.540	2.125	4.913
rho	0.904	0.905	0.897

Std. err. in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

operationalizations support the findings for hypothesis 1.

6.2.2 Measure of capacity

For purposes of parsimony only the theoretically important independent variable state capacity will be discussed in its alternative forms. State capacity are perceived in many different conceptual and operational forms and the theoretical contributions on the relationship between state capacity and characteristics of the state, such as democracy/polyarchy, are diverse and extensive. Building on the literature review in chapter 2 I choose two alternative state capacity variables. First I model on a measure of extractive capacity. This is soundly based in a long historical tendency to equate state abilities with resource extraction. Extractive capacity are measured by the

Table 6.3: Alternative 'state capacity' results

	(1)	(2)	(3)
Capacity			-1.308 (1.294)
Adm. cap.		-5.510 (15.121)	
Extr. cap.	2.285 (5.361)		
GDP pr. cap.	-0.0001 (0.0002)	29.130** (9.857)	-0.00006 (0.0002)
Fiscal freedom	0.051 (0.075)	0.027 (0.087)	0.045 (0.081)
Gini income	-0.326 (0.190)	-0.315 (0.195)	-0.292 (0.197)
Oil exports	0.0003 (0.002)	0.0001 (0.002)	0.0004 (0.002)
Constant	29.130** (9.857)	34.939** (13.345)	29.269** (9.966)
$p > F$	0.1835	0.5574	0.1795
sigma_u	14.930	14.555	14.536
sigma_e	4.924	4.920	4.913
rho	0.901	0.897	0.897

Std. err. in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

proportion of state revenue coming from taxation. This measure extractive capacity while not measuring the policy choice of tax levels such as a measure of tax as a proportion of total GDP. second, I include the ICRG measure of quality of government as a proxy for administrative capacity. No capacity coefficient in table 6.3 is significantly different from zero, but it should be noted that administrative capacity renders the coefficient of GDP per capita significant.

6.3 Summary

In the previous section I have documented how the data used for analysis comply with the most central assumptions and requirements of panel data analysis. With some reservations on the effect of non-normal residuals on estimation efficiency, the inferential foundations of the analysis should be valid. Furthermore, alternative operationalizations of democracy and capacity have been applied, without substantial change in the estimates of their effects on democracy.

Figure 6.1: Residuals on fitted values

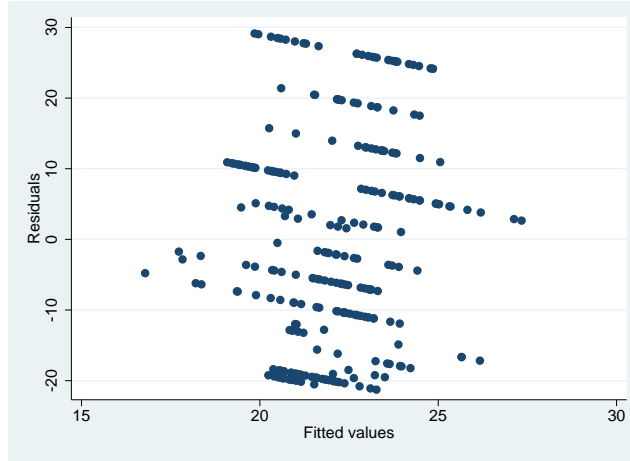


Figure 6.2: Residuals on state capacity

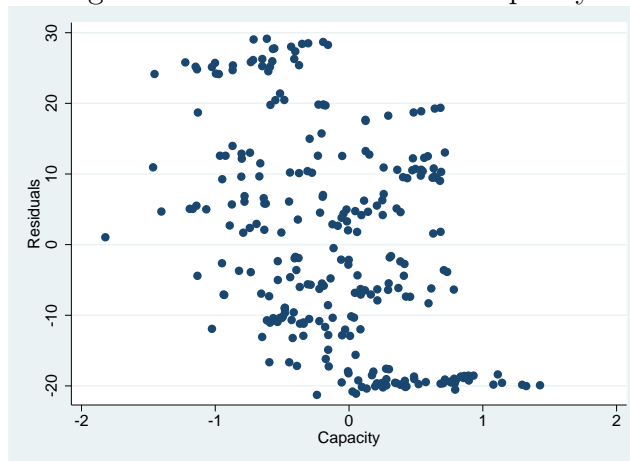


Figure 6.3: Residuals on freedomindex

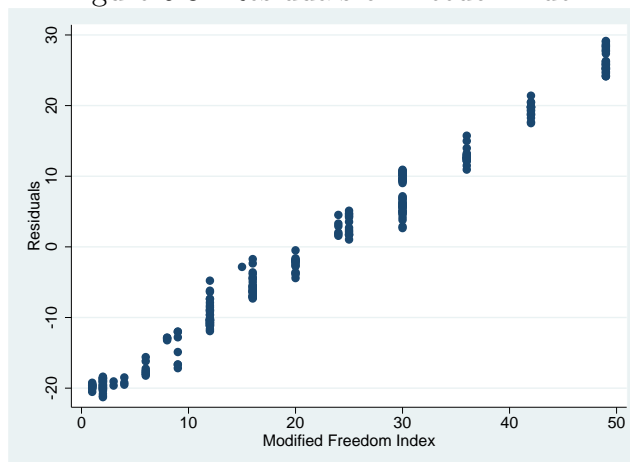


Figure 6.4: Kernel density plot for residuals in fixed effects

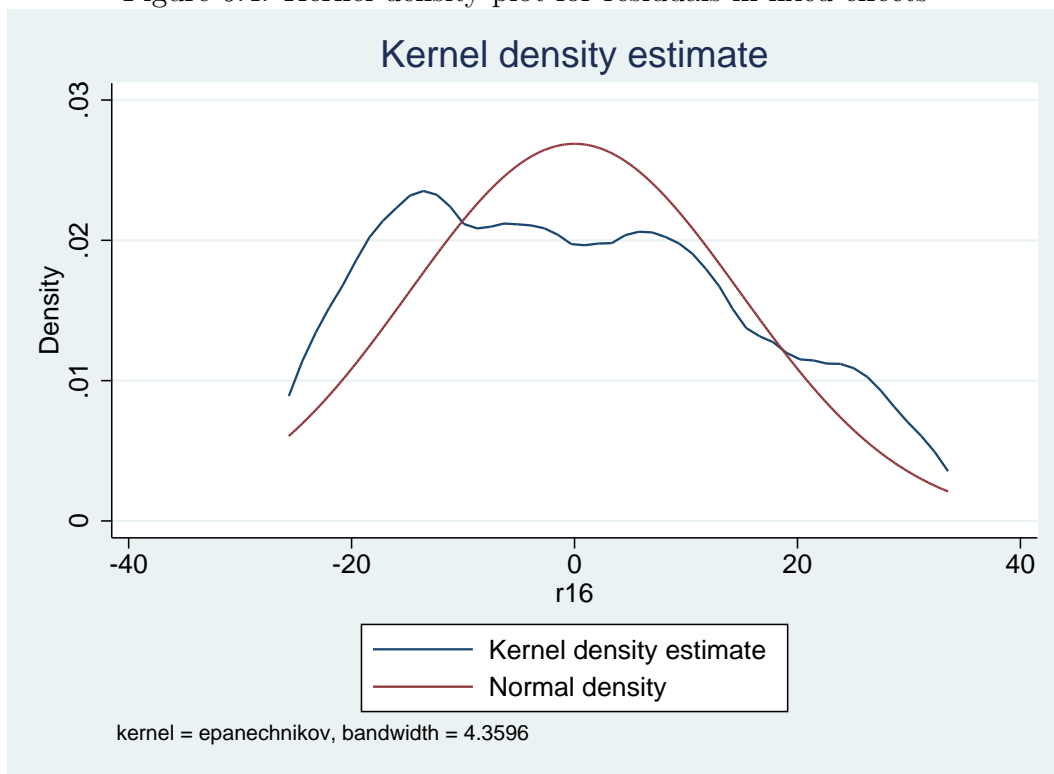
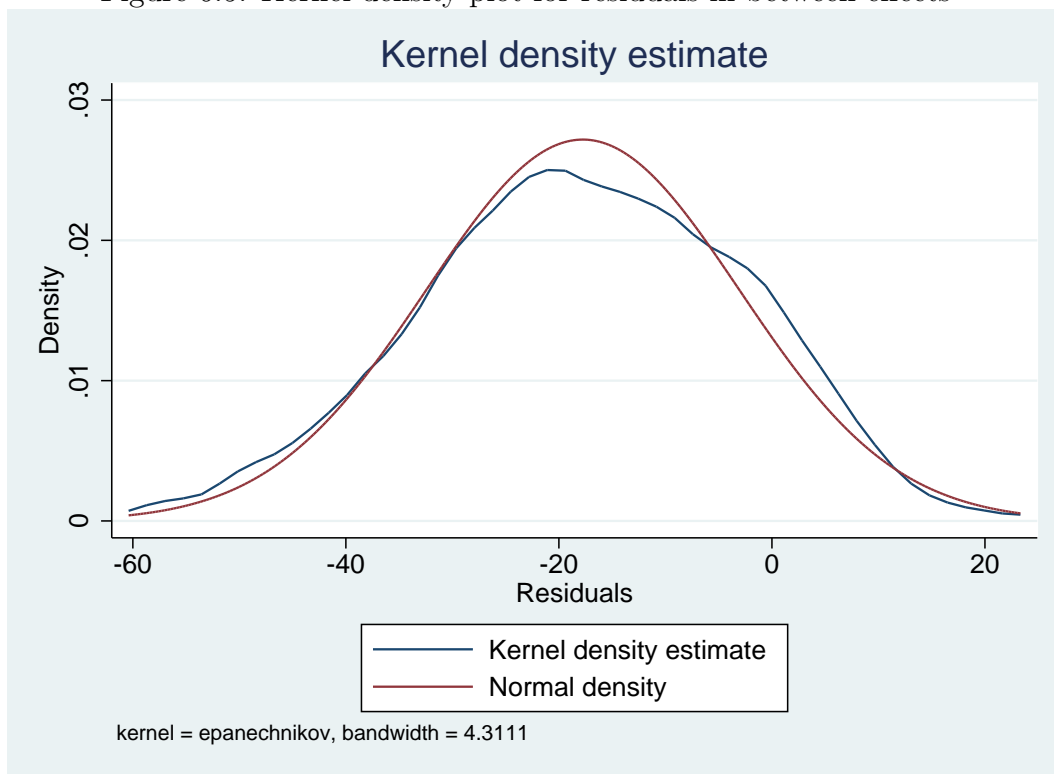


Figure 6.5: Kernel density plot for residuals in between effects



7 Conclusions

This thesis have utilised fixed effects panel data analysis to test hypotheses regarding the relationship between state capacity, conceptualized as the capacity to extract resources, the capacity to maintain monopoly on legitimate use of violence and provide security, and the capacity of the state administration to act according to the Weberian concept of bureaucracy.

7.1 Main findings

In the preceding study I have delved into the empirical relationship between state capacity and democracy. Guided by a theoretical framework 3 hypotheses were tested. In testing hypotheses 1a and 1b I found no support for a general tendency for changes in state capacity to be associated with higher or lower levels of democracy. Rather, my finding suggests that the capacity-regime relationship differ between countries. For some countries increases in state capacity were associated with increases in democracy, for others increases in state capacity were associated with reductions in democracy. In the undemocratic and war torn Tajikistan positive changes in state capacity reduces democracy substantially, while for the more democratic Moldova the strong relationship are reversed. There were also for several countries no significant association in either direction. Testing general between-subject variability, state capacity and democracy were clearly and significantly positively associated. For hypothesis 2 I tested whether a non-linear model were better suitable to explain the capacity-regime relationship. The second degree polynomial were fitted, but found to diverge little from a linear model.

Differencing by region revealed that the curved relationships, as for the fixed effects analysis, were different both in steepness, and direction. Testing the hypothesis with a fixed effects model with capacity and regime type interacted did not yield any significant or substantial results.

7.2 Compliance with theory/Implications

The divergent findings of within-subject and between-subject estimators could support the structuralist claim in the literature that state capacity and democracy in former socialist countries are factors of deep structural and historical origins (Kitschelt 2003; Møller and Skaaning 2011a) not easily changed in short time-spans. Should the time-varying fixed effects be significant, theories holding elite actions as central in explaining democracy (O'Donnell and Schmitter 1986; Bunce 2000) could be said to be strengthened. In such a case it could be argued that political decision and processes shape the levels of state capacity and democracy to vary in short time-spans. The between-subject differences may suggest that democracy are not shaped by simultaneous variation in capacity, but rather of some historical factor(s). As a within-subject tendency could not be confirmed and as the between-subject tendency are significant and substantial, a common historical or structural origin of both state capacity and democracy is a possible explanation for the findings of hypothesis 1a and 1b.

The findings for hypothesis 2 does not comply with the literature holding the capacity-regime relationship as J-shaped or curved, rather it supports

the main theoretical contributions of linearity. If its insignificant findings could be said to support anything, it must be that a linear fit are the most parsimonious of the two.

7.3 Limitations

No inquiry are without its limitations and drawbacks. This thesis are no exception. Failing to support the hypothesis of state capacity's positive effect on levels of democracy does, as demonstrated by interacting capacity with regions and countries, does not imply such effect cannot be found in some countries or regions. As there are no grand tendency within the 15 countries, methods capturing the divergent relationships could be better suited for the purpose. As multilevel models assume slope and intercept variation around a underlying general tendency, a tendency not found in the post-Soviet countries, such models are inappropriate for the investigated subject. Turning away from statistical methods, case study methods or small-N comparative studies could be better suited at shedding light on the causes of the different directions of the capacity-democracy between countries.

Conceptualization and operationalization are in the social sciences one of the main causes of loss of validity (Sartori 1970). There exists numerous available ways of measuring state capacity and democracy. Hopefully the cross-validation by alternative measurements demonstrate the validity of my findings. One can also question the attempt to find a generic state capacity applicable to all countries. This thesis have countered such criticism by

limiting the study to the fifteen post-Soviet states, although the validity of a general concept also for these countries could be challenged. Should state capacity in Turkmenistan be something completely different from state capacity in Estonia, a difference of kind not of degree, the search for a general tendency of state capacity and democracy may be in vain.

7.4 Further research

Concluding with a note on further research I propose some issues in need of clarification. First, following the inconsistent capacity-regime relationship in former Soviet republics, research into the causes of this differentiation are needed. Whether it is historical, cultural, or geographical features, the institutional legacies of the Soviet Union or the actions of elites during the early transition period, or class or economic forces that determine the direction of the relationship are of great theoretical interest. Studying the variation in the dynamics of state and regime may not only shed light on existing theories, but may also contribute to the policy practices of democratization efforts. Second, although not embraced by the research question of this thesis, studies into the causes and beneficial conditions of state capacity are needed. The literature on the subject are primarily characterized by studies on the consequences of capacity and developing this subject further are necessary.

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A Appendix A: Variable description of main variables

Table A.1: Variable description

Variable name	Description	Source
country1	Countries coded 1-15 alphabetically.	
year	Years from 1991-2013	
politicalrights	Scores from 1 (completely free) to 7 (completely unfree). Subcategories of 'electoral process', 'political pluralism and participation', and 'functioning government'.	Freedom House index
civilliberties	Scores from 1 (completely free) to 7 (completely unfree). Subcategories of 'freedom of expression and belief', 'associational and organizational rights', 'rule of law', and 'personal autonomy and individual rights'.	Freedom House index
freedomindex	Aggregated as arithmetic mean of politicalrights and civilliberties. Scores categorized as free (1.0-2.5), partly free (3.0-5.0), or not free (5.5-7.0).	Freedom House index

Continued on next page

Table A.1 – *Continued from previous page*

Variable name	Description	Source
freedomindexmulti	Aggregated by multiplication of politicalrights and civilliberties to refuse compensability.	
Capacity	Standardized $\mu = 0$ and $\sigma = 1$. Positive scores indicate high state capacity.	Preliminary State Capacity Dataset

Table A.2: Countries

Country name		
Armenia	Azerbaijan	Belarus
Estonia	Georgia	Kazakhstan
Kyrgyzstan	Latvia	Lithuania
Moldova	Russia	Tajikistan
Turkmenistan	Ukraine	Uzbekistan

B Appendix B: Replication data and syntax

As the ability to reproduce scientific works in order to criticise, correct, support or refute its results are of great importance to science in general and the reliability of this thesis in particular, both the data used and the syntax used to manipulate the data are made available for all interested parties. Datasets and syntax are available through the Harvard Dataverse Network, an open source application for sharing research data organised by The Institute for Quantitative Social Science at Harvard University. The data and syntax can be found following this reference:

Simensen, Gaute, 2015, "Replication Data for Master's thesis: State Capacity and Democratization in Post-Soviet States: A Panel Data Analysis", <http://dx.doi.org/10.7910/DVN/MJMF45>, Harvard Dataverse, DRAFT VERSION [UNF:6:R7TuwnBM1spVD192y8J8dw==]

C Appendix C: Imputation

Kernel density plots of observed and imputed values, overlay.

Table C.1: Missing observations for variables

Variable name	Missing	Total	Percent missing
country1	0	270	0.00
year	0	270	0.00
region	0	270	0.00
politicalrightss	0	270	0.00
civilliberties	0	270	0.00
freedomindex	0	270	0.00
regimetype	0	270	0.00
polsys	0	270	0.00
fiscalfreedom	65	270	24.07
gle_rgdpc	0	270	0.00
icrg_qog	151	270	55.93
ross_oil_netexpc	0	270	0.00
wdi_popurbper	0	270	0.00
polity2	0	270	0.00
gininet	9	270	3.33
taxpercrev	46	270	17.04
freedomindexmulti	0	270	0.00
occinc	0	270	0.00
oppelect	0	270	0.00
Capacity	0	270	0.00

Table C.2: Unimputed and imputed summary statistics

Variable name	Unimputed		Imputed	
	Mean	Std. dev.	Mean	Std. dev.
fiscalfreedom	73.686	17.947	71.034	18.747
icrg_qog	0.474	0.098	0.493	0.090
rpe_gdp	1.159	0.38	1.136	0.376
gininet	34.626	5.046	34.615	5.004
taxpercrev	0.700	0.154	0.6883643	0.162

Figure C.1: Missingness map

