Institutions, Economic Growth, and Foreign Aid in Nepal

Aydin Cecen[1], Linlan Xiao[1] & Santosh Adhikari[1]

[1] Department of Economics, Central Michigan University, Mount Pleasant, MI, USA

Correspondence: Linlan Xiao, Department of Economics, Central Michigan University, MI, 48859, USA. Tel: 1-989-774-2579. E-mail: xiao1l@cmich.edu

Abstract

This paper investigates the dynamics of economic development in Nepal in the context of foreign aid, institutional change, and political instability. A brief historical account of the recent revolutions is provided to highlight the institutional background of the empirical analysis. Taking into account the time series properties of the variables of interest, the econometric analysis demonstrates that contrary to the results of some recent cross-section studies, foreign aid does contribute positively to economic development in Nepal. On the other hand, the estimation results reveal that "human capital" accumulation and political unrest have had little long term effect on per capita income.

Keywords: Nepal, revolutions, foreign aid, instrumental variables

1. Introduction

This study is aimed at investigating the dynamics of economics economic development in Nepal in the context of institutional change and political contest. The emphasis is on the interaction between political unrest, perpetuated by the power struggle between various contending political groups, and an adverse institutional structure. Given the fact that historically foreign aid has accounted for a large percentage of output and has been used extensively to finance several five-year development plans, the empirical analysis also examines the impact of foreign aid on economic development in Nepal.

As a landlocked country between the two most populous nations of the world, China and India, together with its intriguing socio-political matrix, Nepal offers researchers a quasi "natural experiment" on the basis of which several fundamental questions raised by the recent literature on institutions and institutional change could be investigated. Furthermore, with its rich historiography of political reforms and revolutions, it sheds light on some crucial issues concerning the dynamics of social revolutions and human capital accumulation in rural societies.

With 30 percent of its population under the poverty line, Nepal is one of the poorest countries in South Asia. Even though poverty has declined substantially in recent years, 44.2 percent of the population in 2011 is still living below the international poverty line (people earning less than US$1.25 per day, *Wiki*). Nepal has never been formally colonized, although both its neighbors, India and China have politically and economically influenced Nepali society throughout centuries. Out of 178 countries, Nepal ranks 30th on the Failed States Index developed by the Fund for Peace (see, Failed States Index, 2013). On the other hand, Human Development Index (HDI) ranks Nepal as 137th out of 177 nations according to the United Nations Development Programme (UNDP, 2006). Despite large flows of remittances and unusually high rates of foreign assistance – reaching almost 10 percent of GDP in the 1990's – the incidence of poverty is endemic to the Nepali economy. While a ten-year war between the CPN-M (Communist Party of Nepal-Maoist) and the government troops that officially ended in 2006 could partly explain the plight of Nepalese society, the historical roots of underdevelopment in Nepal go well beyond the chaotic state of affairs of the last three decades.

This study is motivated by the literature that emphasizes the role of institutions in shaping economic development, together with other geographical, ethnic, and religious factors that are themselves embedded in some of these formal and informal institutions (North, 1981; Benarjee & Ghatak, 2005). Indeed, the prevailing cast system, the Hindu culture, a large number of distinct ethnic identities, *pari passu* a land tenure system whose roots go back to what the nineteenth century historians called "oriental despotism", are all parts and parcels of Nepal's institutional landscape. None of them existed in isolation, and each of them has emerged and developed over time by establishing the initial conditions for the future dynamics of the region.

In this context the paper draws on a number of strands of research in development economics. First it investigates whether foreign aid does help economic development in Nepal. There is a voluminous literature on the aid-development issue (Rajan & Subramanian, 2008; Rajan & Subramanian, 2011; Burnside & Dollar, 1997; Alesina & Dollar, 2000; Boone, 1995; Carl-Johan, Hansen, & Tarp, 2004; Easterly, 2003; Hansen & Tarp, 1992; Hansen & Tarp, 2001; Pack & Pack, 1993; Svensson, 2000; Trumbull & Wall, 1994; Tierney et al., 2012). Yet it remains controversial: while some cross-country studies conclude that foreign aid does not contribute to economic growth, others reach the conclusion that foreign aid does matter for economic development. Our econometric analysis shows that foreign aid affect per capita income positively in Nepal, which is consistent with the results of Bhattarai (2009).

Second, the study questions the dynamics of human capital accumulation in relation to land ownership. Because arable land is scarce and unequally distributed across the rural population in Nepal, investment in education, hence human capital accumulation has been historically inadequate. Consistent with the theoretical model and the empirical findings of Galor, Moav and Vollrath (2009), the emergence of human capital promoting institutions has remained slow and weak. Indeed our econometrics findings demonstrate that, despite important educational reforms and successful poverty alleviation policies of the last two decades, there appears to be little statistical association between "human capital" and national income levels in Nepal; this is in agreement with the results of a comprehensive report prepared by the Asian Development Bank and International Labour Organization (2009) on the critical development constraints in Nepal.

Finally the results of this county study relate to the research on the controversial issue as to whether human capital or institutions are more important for economic performance (see, for instance, Greif, 1994; Acemoglu & Johnson, 2004; Glaeser & Shleifer, 2004; Bhattacharyya, 2009). The empirical findings appear to imply that both weak human capital and an adverse institutional structure largely account for low income levels in Nepal.

The paper is organized as follows. Section II provides a brief *histoire raisonnée* of the genesis of democratic institutions through gradual reforms and violent revolutions, as well as the evolution of land ownership against the background of a non-feudal dynastic state. It also dissects the Nepali institutional structure in light of several fundamental questions posed by the recent literature on institutions and economic growth. Section III develops the empirical model. Section IV discusses the empirical results of the econometric analysis. Section V offers some concluding remarks.

2. Revolutions, State, and Land Tenure in Nepal

Revolutions are complex phenomena to analyze. Though they need to resolve the problem of collective action, they can be explained by rational choice (Olson, 1960; Roemer, 1985; Grossman, 1991). It is difficult to time revolutionary outbreaks precisely, for historical accidents can ignite revolutionary fervor; yet in some sense, they are "structurally determined" in response to the "crisis of state" and economic shocks (Skocpol, 1979; Miguel, Satyanath, & Sergenti, 2004). They bring about a radical restructuring of the existing institutions, more particularly the political system and the property rights; and however "civilized" they may be deemed to appear in hindsight, they involve radical action and violence (Pincus, 2009). Furthermore revolutions, as recent research demonstrates, are associated with geographical and climatic conditions (Hsiang, Meng, & Cone, 2011). Yet it can be argued that the most important characteristics of a genuine revolution involve its ability to change the institutional matrix of societies by creating more inclusive and efficient institutions.

In 1996, the CPN-M staged a full-fledged popular uprising that lasted more than a decade: around 8,000 Nepalese were killed by the government troops, which involved first the police force but subsequently the whole Royal Nepal Army and 4,500 lives were destroyed by the CNP-M's armed wing, People's Liberation Army. By the end of 2005, almost 90 percent of the rural areas fell under the control of the Maoist revolutionary forces. While the definition and coding of civil war is often contested (Blattman & Miguel, 2010), these battle-death statistics, however inaccurate, appear to confirm that Nepal was indeed engulfed in a ubiquitous civil war, which ended with a genuine revolution. On December 27, 2007, the centuries-old monarchy was toppled and replaced by a democratic federal republic.

What has been difficult to explain, however, are the reasons as to why the rebellion began in 1996 at a time when political and economic reforms seemed to have been working for the common good (Basnett, 2009). In fact, the first constitution was promulgated in 1959. As the Nepali Congress party won a two-thirds majority, it embarked on a moderate program of state redistribution and land reform. Using his emergency powers, however, on December 15, 1960, King Mahendra retaliated by dissolving the parliament, banning all political parties, and arresting the Prime Minister Koirala. With the toppling of the democratically elected government of Nepali Congress, a monarchic system with a national legislature, *Panchayati Raj* was established. Launched as a

"democracy" without political parties, it consisted of a legislature elected indirectly by the village, district and zonal assemblies (*panchayats*), with only an advisory capacity to the King. The period 1960–1990 ushered in a decade of modernization and institutional reforms without much success in reducing overall poverty in Nepal. Nevertheless, education, health, transportation improved gradually, increasing the literacy rates from 2 percent in the 1950's to over 40 percent by the 1990's.

The *Panchayat* era came to an end in 1991, as the regime collapsed amid an economic crisis prompted by India's imposition of a trade blockade by not renewing the 1950 Trade and Transit Treaty; and under the pressure of non-violent mass protests organized by the Nepali Congress and various Communist parties, the leader of the Nepali Congress party, Prasad Koirala, was elected the prime minister through a general election to the House of Representatives. Hence the First Democratic Revolution*, Jan Andolan I*, marked the beginning of a new stage in the struggle for democracy in Nepal. The new constitution, however, retained the three cornerstones of the *ancien régime*: monarchy, the Nepali language and Hinduism. Hinduism remained as the state religion and Nepali the sole state language. The King was the Commander-in-Chief of the Royal Nepal Army, and held special emergency powers (Vanaik, 2008).

In hindsight, it is possible to delineate three main reasons behind the 1996 uprising. First party factionalism and political instability quickly eroded the gains of the newly created democratic institutions: within a ten-year period, fourteen coalition governments, formed by the Nepali Congress and various communist parties, came and left the political scene without any tangible improvement in poverty reduction, health and education of the country. Second, a population growth of 2.25 percent per annum on average during 1960–2007 and slow GDP growth meant that per capita income in Nepal remained the lowest in the region during the same period. Moreover, between 1995/6 and 2003/4, the overall incidence of poverty did decline somewhat but inequalities rose: the income Gini coefficient for Nepal, which is the highest in South Asia, rose from 0.38 in 1995/96 to 0.47 in 2003/04. Other measures of income inequality, such as inter-quintile ratios, reinforce this trend: the richest quintile of the population kept increasing its share, and by the end of this period had incomes nearly 10 times those of the lowest quintile (ADB & ILO, 2009, p. 12). In this context, it is important to note that *contra* Basnett, it is this rising trend of inequality that brought about political violence; as a recent empirical study by Nepal et al. (2001) shows, more inequality induced more bloodshed.

The February 2005 palace coup whereby Gyanendra had captured the crown paved the way for *Jan Andolan II*, the Second Democratic Revolution in Nepal. Trade unions, teachers and lawyers associations, several nongovernmental organizations in urban areas, seven political parties (Seven-Party Alliance) together with the CPN-M subsequently launched mass demonstrations and strikes that ended with a Memorandum of Understanding; with the backing of the Indian government, the Memorandum called for a unified action against autocratic monarchy, restoration of the parliament, and the formation of a Constituent Assembly. In the aftermath of April 2006 *Jan Andolan II* events, the parliament was restored, the king was stripped of all executive powers, the Royal Nepal Army was brought under civilian control, and Nepal was declared a secular republic.

From its establishment in 1768 by the ruler of Ghorka, Pridhivi Narayan Shah, to early 19th century, Nepal remained as an absolute monarchy where all land belonged to the state. Unlike feudalism in Europe, there was, *de jure*, no landed aristocracy, nor a peasantry that was directly dependant on landlords. Instead, as in India until the late 1700's, an omnipotent state was the central player. A well-defined cast system based on Hindu culture provided the ethno-religious background: "the crown was the supreme owner of all land or at the apex of land tenure system before 1950" (Acharya, 2008, p. 3). Customary tenure systems included *Raikar, Birta, Guthi, Kipat* and other forms of land tenure. *Raikar*, the largest category by its surface area, was the land on which taxes were levied. Under the other land tenure systems, however, land was distributed to government functionaries, military, some artisanal groups, religious organizations and no taxes were levied on these landholdings. When the state power began to weaken due to various internal and external developments, the institutional equilibrium collapsed and gave rise to the emergence of feudal landowners. Eventually, most of these land tenures were abolished or converted into *Raikar* after 1950. Since the enactment of Land Related Act (1964) and Land Revue Act (1978) there have been concerted efforts to register all landholdings and establish well-defined property rights on land in Nepal.

Recent research suggests that land ownership has played an important role in the transition from agrarian societies to modern capitalism because it shaped the modes of capital accumulation, hence economic growth. In a detailed study, Galor et al. (2009) argue that inequalities in land ownership have had a detrimental effect on the accumulation of human capital and the development of human capital promoting institutions. More specifically, in economies where land ownership remained unequal, landowners had little incentives to promote public education, hence human capital accumulation. As the industrialization process has increased the complementarity between

physical capital and human capital, the economies with a low stock of skilled labor have stagnated whereas those with a more equally distributed land ownership profile implemented public education policies and embarked on a rapid growth path.

In Nepal where a large portion of the population still depends on agriculture despite rapid urbanization of the last two decades, land ownership appears to be one of the main institutional constraints on human capital accumulation, hence on sustained economic growth. It can be argued that the unequal land distribution embedded in a convoluted systems of land tenure mentioned above, however, has been perpetuated by the very institutions of constitutional monarchy and the concomitant cultural and ethnic identities. It is therefore difficult to "unbundle institutions" *a la* Acemoglu and Johnson (2005) in Nepal, even if one subscribes to the virtues of Occam's razor (Rodrik, 2007). Furthermore, given recent household survey statistics, it is clear that income inequality in Nepal is strongly associated with the household head's education level: decomposition analyses by Theil's index reveal that as much as 26 percent of income inequalities in 2003/2004 can be explained by the differences in education levels-p.14, ADB and ILO (2009). While literacy rates have increase substantially over the last four decades or so, illiteracy is still high by international standards. Yet, as in many less developed economies, educated workers are not in short supply in Nepal: the unemployment rate among better educated workforce is in fact higher than unemployment among illiterate or less educated workers (ILO, 2009, p. 29).

3. Model Specification

Since the 1960's Nepal has gone through three distinct periods of economic growth: 1961–1980, a phase of slow growth during which GDP grew at an average rate of 2.3 percent per annum; 1981–2000, a fast growth phase with a GDP growth of about 4.6 percent; and 2001–2010, a phase divided between a slow growth sub-period 2001–2006, ending with accelerating growth. It is also important to note that since the 1970's the agricultural sector grew on average at a lower rate than the overall GDP growth rate.

Most country studies that investigate the empirics of economic growth rely on some versions of a Solow growth model with a neoclassical production function of the Cobb-Douglas form. In light of the previous review, we identify five important empirical facts, which we use for the specification of a macroeconomic model for Nepal. First, while systematic labor surveys data are not available, household survey data show that unemployment rates are relatively low but underemployment rates are high in Nepal. Second, Nepal's enterprise structure does not depend on highly educated workers, and returns to education are not disproportionately higher for skilled workers in most sectors, which may imply that skills are not short-supplied in most sectors. Third, investment and growth are constrained by limited and inadequate infrastructure (ADB & ILO, Report, 2009, pp. 28–31). Forth, functional income distribution is heavily skewed towards the capital and land owners. Last but not the least, the political economy of Nepal reveals that when governments become more democratic and implements political reforms conducive to more inclusive institutions, the economy responds positively.

We propose, in the spirit of a simple log linear AK endogenous growth model, the following time series specification to investigate the determinants of economic development in Nepal.

$$gdp_t = \alpha + \beta_1 aid_t + \beta_2 K_t + \beta_3 L_t + \sum_i \delta_i institutions + \sum_j \gamma_j others_t + u_t \qquad (1)$$

Where u_t is the error term.

In Eq. (1), the explanatory variables include measures of physical capital (K_t) and human capital (L_t), foreign aid (aid_t), and dummy variables which control for institutional change and political unrest. The first democratic revolution in 1991, *Jan Andolan I,* and the onset of the Maoist uprising in 1996/97 that gave rise to *Jan Andolan II in 2006* are modeled by two dummy variables, to control for "regime shifts". Specifically, the dummy variable D_{dem} takes on the value 1 during 1991 through 1996 and 0 otherwise; and the binary variable D_{insurg} takes on the value 1 during 1997–2006 and 0 otherwise to control for the Maoist insurgency. Other potential variables include a number of interaction terms. It is important to note here that while this type of linear AK endogenous growth models has been criticised in the literature (see, for instance, Mankiw et al. (1992) on the basis of linearity of output in terms of total "capital stock", hence the high share of capital in total output, we believe that this type of specification, which emphasizes the scarcity of both physical and human capital is more appropriate to model aggregate production in Nepal.

To identify the effects of explanatory variables on the level of GDP, we consider three different estimation techniques: an ordinary least squares procedure (OLS), a two-stage least squares procedure (2SLS) and a full modified instrumental variable procedure (FMIV) proposed by Phillips and Hansen (1990). The simple OLS procedure is used as a benchmark. However, as we are using time series data, most of our variables are found to be non-stationary and integrated of order one, i.e., I(1) processes; as is well known, the OLS regression in this

case would produce spurious results. However, if there exists a linear combination among the I(1) processes, then the time series are said to be co-integrated and satisfy an equilibrium relationship, in which case OLS estimators would be consistent. To test for non-stationarity we apply three commonly used unit root tests, namely the Dickey-Fuller (DF-GLS), the Augmented Dickey-Fuller (ADF), and the Phillips-Perron (PP); and the Johansen Likelihood Ratio test is employed to test for co-integration.

As discussed in several empirical papers, an important econometric problem encountered in the investigation of foreign aid is the endogeneity issue. The main reason, as emphasized by Hansen and Tarp (2000), is that aid is hardly perceived as a lump-sum transfer; instead it usually depends on the country's policy. The OLS procedure that includes foreign aid as a regressor will therefore result in biased and asymptotically inconsistent estimators. To remedy this situation, it is customary to introduce instrumental variables and rely on the 2Stage Least Squares (2SLS) procedure. In order to identify the effect of foreign aid on GDP, we need a source of exogenous variation in aid that does not affect GDP directly. As we are analyzing time series data, naturally we choose the lag of aid at order one as the instrument to remove the correlation between aid and the error term. We have also experimented with some other variables commonly used in the foreign aid literature, such as the openness and inflation, but the results have not been significantly different.

Moreover there is another econometric problem we face in our instrumental variable (IV) regression, namely that the processes in the multivariate regression are non-stationary. One may consider applying the error correction model (ECM), as in Bhattarai (2009): the results of ECM in Bhattarai (2009) suggest that even if the sign of the foreign aid coefficient is positive, it is statistically insignificant even at the 10 percent level. The ECM appears to produce weak results, due probably to the paucity of the available data. On the other hand, even though the traditional IV estimation with non-stationary processes would lead to consistent estimates (Phillips and Hansen (1990)), as Phillips and Durlauf (1986), Stock (1987), and Banerjee et al. (1986) have shown, the second-order asymptotic bias effects could be very serious. To eliminate this bias, Phillips and Hansen (1990) suggest some semi-parametric corrections in IV regression. Two levels of correction are involved, one is serial correlation correction and the other is long-run endogeneity correction. As Phillips and Hansen (1990) indicate, while their approach is asymptotically equivalent to the parametric error-correction mechanism (ECM) in some cases, in other cases it is superior in terms of asymptotic behavior, and the simulation results in their study suggest that their approach also works well with finite samples.

Following Phillips and Hansen (1990), we employ the semi-parametric correction methods in our instrumental variable estimation.

Let $y_t = GDP_t$, $x_t = [x_{1t}, x_{2t}]_t$ where $x_{1t} = aid_t$, $x_{2t} = [Constant, electricity, life\_exp_t]$

Hence the model can be written as

$$y_t = \beta_1 x_{1t} + \pi x_{2t} + u_t \tag{2}$$

Let $z_t = [x_{2t}, k_t]$ be the instrumental variables (IV) where $k_t = [aid_{t-1}]$.

The standard instrumental variable estimation (2SLS) provides:

$$\hat{\theta}_{2SLS} = \begin{pmatrix} \hat{\beta}_1 \\ \hat{\pi} \end{pmatrix} = \left(\sum_1^T y_t \hat{x}'_t \right) \left(\sum_1^T \hat{x}_t \hat{x}'_t \right)^{-1} \tag{3}$$

where $\hat{x}'_t = [\hat{x}'_{1t}, x'_{2t}]$, and $\hat{x}'_{1t} = \left(\sum_1^T x_{1t} z'_t \right) \left(\sum_1^T z_t z'_t \right)^{-1} x_{1t}$.

Let "a" signify the elements corresponding to explanatory and instruments jointly, and "c" signify "u_t" and "a" together (see Phillips & Hansen, 1990, p. 113), Δx_{at} is the first difference of x_{at}, $\hat{y}_t = y_t - \hat{\Omega}_{1a} \hat{\Omega}_{aa}^{-1} \Delta x_{at}$ where $\hat{\Omega}_{1a}$, $\hat{\Omega}_{aa}$ are consistent estimators of long-run covariances of u_t and of Δx_{at}, Δx_{at} and Δx_{at}, respectively. The fully modified "bias-corrected" instrumental variable estimation (FMIV) provides:

$$\tilde{\theta}_{FMIV} = \left(\sum_1^T \hat{y}_t z_t - T(\hat{J}_{uc} \hat{\Delta}'_{zc}, 0) \right) \left(\sum_1^T z_t z'_t \right)^{-1} \left(\sum_1^T z_t x'_t \right) \left(\sum_1^T \hat{x}_t \hat{x}'_t \right)^{-1} \tag{4}$$

Where $T(\hat{J}_{uc} \hat{\Delta}'_{zc}, 0)$ is the bias correction term with $\hat{J}_{uc} = [I, -\hat{\Omega}_{1a} \hat{\Omega}_{aa}^{-1}]$ and $\hat{\Delta}'_{zc}$ being the one-sided long-run covariance between Δz_t and difference of elements of "c".

As Phillips and Hansen (1990) point out, when the processes are I(1) in the instrumental variable case, the traditional methods of inference relying on t-tests, F-tests are not useful; instead an asymptotic χ^2 criterion should be applied, that is, $G_R = (R\theta - r)^{[\widehat{Ravar(\theta)R}]^{-1}} (R\theta - r) \sim \chi_g^2$.

4. Data and Discussion of Empirical Results

We use annual time series data for Nepal from 1960 through 2009. The Official Development Assistance (ODA) definition of foreign aid is used. There are, however, no reliable complete annual data for physical capital stock and human capital for the entire period under study. We therefore use the electricity production (million kwh) as proxy for physical capital. Similarly, usual measures of human capital, such as primary/secondary school enrollment rates are not available for Nepal for the entire 1960–2009 period. Hence, in view of Kalemli-Ozcan et al. (2000) and the related literature on the association between life expectancy and schooling, we use life expectancy at birth (years) as a proxy series for human capital. In Table 1 we provide the strong correlation between these two series for a number of countries, including Nepal for the period 1972–1996. All time series data are from the World Bank data base (databank.worldbank.org). GDP and foreign aid data are in constant 2000 US dollars.

Table 1. Simple correlation between life expectancy and secondary school enrollment

	School enrollment, secondary (% gross)[1]					
	India	Philippines	Nepal	Mexico	Paraguay	Peru
	(1999-2010)	(1971-1999)	(1972-1996)	(1971-2011)	(1971-2010)	(1971-2011)
Life expectancy at birth, total (years)[1]	0.990	0.902	0.994	0.970	0.980	0.981

Note. 1. Source: World Development Indicators from the World Bank (databank.worldbank.org).

All time series data, as expected, are non-stationary. To further identify stationarity of the time series in question, we apply three commonly used unit root tests, namely Augmented Dickey-Fuller (ADF), Dickey-Fuller generalized least squares (DF-GLS), and Phillips-Perron (PP) tests. As is well known, for all these three tests, the null hypothesis is that the time series under study contains a unit root, i.e. the series is non-stationary. The results are presented in Table 2. Clearly all the three tests fail to reject the null hypothesis of unit root suggesting that all the variables are non-stationary. However after taking the first difference of these time series, the unit root tests excluding trend suggest of stationarity, i.e. all the variables are I(1) processes (due to space limit, we do not report unit root test results for the first difference; the results are available upon request).

Table 2. Linear Unit Root tests of the time series used

	DF-GLS	ADF	PP
GDP	-0.654	2.591	3.6
Aid	-1.687	-0.578	-0.368
Electricity	-0.811	5.268	5.303
Life Expectancy	-0.577	6.815	3.923

Note. DF-GLS=Dickey-Fuller Generalized Least Squares Test; ADF=Augmented Dickey-Fuller Test; PP=Phillips-Perron Test. All the tests include trend. *, **, *** indicate significance at the 10% , 5%, and 1% levels respectively.

The Johansen likelihood ratio test is applied to test for the co-integration of these I(1) series. We choose 2 as the order of the VAR. For the Johansen test, the null hypothesis r = 0 indicates that there is no co-integration; the null hypothesis r ≤ 1 indicates that there is at most one co-integrating equation; and the null hypothesis r ≤ 2 indicates that there are at most two co-integrating equations; etc. We begin our investigation between GDP and each of the explanatory variables respectively and the results are displayed at the top three panels of Table 3. Clearly, the null of no co-integration is rejected at 5 percent significance level, suggesting that GDP has a long-run equilibrium relationship with each of these explanatory variables. Further, we test for the co-integration between GDP and all these explanatory variables. The result is presented at the bottom panel of Table 3. The test statistics suggest four co-integrating vectors: therefore all these I(1) processes are co-integrated and an OLS procedure would result in unbiased and consistent estimators.

Table 3. The Johansen cointegration test results

		GDP and Aid		
VAR(2)	Hypothesis			
Eigenvalue	Null	Alternative	Λmax	Λtrace
	r=0	r=1	17.79**	17.85**
0.3097	r≤1	r=2	0.0575	0.0575
		GDP and Electricity		
VAR(2)	Hypothesis			
Eigenvalue	Null	Alternative	Λmax	Λtrace
	r=0	r=1	18.42**	21.24**
0.3133	r≤1	r=2	2.82	2.82
		GDP and Life Expectancy		
VAR(2)	Hypothesis			
Eigenvalue	Null	Alternative	Λmax	**Λtrace**
	r=0	r=1	60.3581**	62.2040**
0.7082	r≤1	r=2	1.8459	1.8459
		GDP, Aid, Electricity and Life Expectancy		
VAR(2)	Hypothesis			
Eigenvalue	Null	Alternative	Λmax	Λtrace
	r=0	r=1	120.4288**	163.8062**
0.9186	r≤1	r=2	17.0552**	43.3774**
0.2991	r≤2	r=3	16.6580**	26.3222**
0.2932	r≤3	r=4	9.6642**	9.6642**

Note. ** indicates significance at the 5% level. Under the null: r=0, there is no co-integration; under the null: r≤1, there is at most one co-integrating equation; under the null: r≤2, there are at most two co-integrating equations; under the null: r≤3, there are at most three co-integrating equations.

The OLS results are presented in Table 4. Regression (1) is the benchmark model which includes aid in addition to the two input variables, electricity and life-expectancy. The results show that life expectancy (the proxy for human capital) has no significant effect on GDP, but the coefficients of aid and electricity are both positive and significant at 1 percent level. All these results are consistent with our discussion in Sections II and III. Regression (2) introduces two dummy variables, D_{dem} and D_{insurg} into the model. The results suggest that "democracy" has a significant, positive effect on GDP while "insurgency" (political unrest) does not. It is worth noting that controlling these types of "regime shifts" does not affect the signs, magnitudes and significances of other variables. Foreign aid and electricity still have positive effect on GDP and are highly significant whereas life expectancy is still insignificant, suggesting that the estimation results are robust to model specification. In regression (3) and (4) the interaction terms, D_{dem}*aid and D_{insurg}*aid, are included to capture the ways in which they interact with each other. The coefficients of both interaction terms are insignificant even at 10 percent level, suggesting no interaction of foreign aid and the "regime shifts". Overall all OLS results show that both aid and electricity positively affect GDP and are statistically significant while life-expectancy has no significant effect. The "democracy" positively affects GDP while "insurgency" (political unrest) does not have a significant effect. Large values of R-squared suggest that the AK model fits the level data fairly well.

Table 4. Ordinary Least Squares (OLS) estimates

Dependent variable: GDP (USD in constant 2000 prices)

	OLS (1)	OLS (2)	OLS (3)	OLS (4)
Aid	0.037***	0.030**	0.032**	0.033**
	(0.013)	(0.012)	(0.013)	(0.013)
Electricity	0.033***	0.033***	0.033***	0.033***
	(0.004)	(0.004)	(0.004)	(0.004)
Life	0.372	0.307	0.256	0.224
Expectancy	(0.529)	(0.532)	(0.543)	(0.545)
D_dem		7.724**	24.037	24.592
		(3.309)	(24.476)	(24.905)

D_insur		5.311	5.452	12.215
		(4.363)	(4.432)	(25.922)
D_dem*Aid			-0.039	-0.040
			(0.058)	(0.059)
D_insurg*Aid				-0.018
				(0.069)
R-squared	0.969	0.973	0.973	0.973

Note. N = 50. Robust standard errors adjusted for heteroscedasticity are reported in parenthesis.

*, **, *** denote significance at 10%, 5%, and 1% levels respectively.

Table 5 presents the 2SLS estimates in columns 2-3 and the FMIV results in column 4. The 2SLS results show that the coefficients of both foreign aid and electricity are positive with relatively small standard errors, suggesting that these two variables positively affect GDP and are statistically significant regardless of whether the "regime shifts" are controlled for or not. On the other hand, life-expectancy has no significant effect on GDP. We also find that 2SLS results suggest that "regime shifts" do not affect GDP significantly. The first-stage F-test is applied to test the validity of the instrumental variable; the large value of F-statistics and a small p-value suggest that the instrument is strongly correlated with our endogenous variable. When two dummies are excluded, the Wu-Hausman test result suggests that foreign aid is endogenous, however, when the "regime shifts" are controlled for, the test fails to reject exogeneity. The FMIV results are similar to those of 2SLS. Aid and electricity have positive effects on GDP and the large values of Chi-square statistics suggest that the effects are statistically significant; on the other hand, life-expectancy does not affect GDP significantly. The overall Chi-squared statistics is 1622.3, suggesting that the entire group of independent variables significantly explains GDP.

Table 5. 2SLS estimates and Fully Modified Instrumental Variables (FMIV) estimates

Dependent variable: GDP per capita (USD in constant 2000 prices)

	2SLS (1)	2SLS (2)	FMIV (3)
Aid	0.059***	0.049*	0.0715***
	(0.022)	(0.026)	[13.253]
Electricity	0.035***	0.034***	0.0357***
	(0.004)	(0.004)	[79.167]
Life-expectancy	-0.267	-0.169	-0.5174
	(0.724)	(0.761)	[0.017]
D-dem		6.198	
		(4.121)	
D-insurg		6.375	
		(3.830)	
First stage F-sta.	242.2	153.12	
First stage p-value	0.000	0.000	
Wu-Hausman F-test	3.177*	1.209	
χ^2 statistics			1622.3***

Note. N = 49. The instruments for aid include lag (aid). Standard errors adjusted for heteroscedasticity

are reported in parenthesis for 2SLS(1) and 2SLS (2). Chi-squared are reported in brackets for FMIV(3). *: statistically significance at 10% level. **: statistically significance at 5% level. ***: statistically significance at 1% level. The p-value for Hausman test is 0.0003, indicating there is endogeneity.

Comparing the results of these three different approaches, we find that the coefficient estimates of foreign aid and electricity are consistent; however, while the coefficients for electricity are very similar across different methods, the coefficient for aid in FMIV is much higher than those in OLS and 2SLS. Moreover, the sign of coefficient for life-expectancy in OLS remains positive whereas it becomes negative in 2SLS and FMIV, implying that applying OLS and 2SLS procedures would introduce bias when there exist endogeneity and nonstationarity; this bias could be serious under certain circumstances.

5. Concluding Remarks

This study has been motivated by the recent literature that emphasizes the key role institutions play in economic development. The history of Nepal provides many clues to our understanding of institution building and the importance of human capital and political change in economic development. First, land ownership and unequal distribution of land is probably the most important factor that explains stagnation and poverty in Nepal. As discussed in Sharma (1999), "about 17 percent of the total land area of Nepal is agricultural land...The bottom 44 percent of the agricultural household operate only 14 percent of the total agriculture land area, while the top 5 percent occupy 27 percent." (lines 12, 20, Sharma, 1999, p. 1). This deep causality between unequal land ownership, low physical capital stock and underdevelopment, however, cannot be construed as the primacy of the institutions of property rights. That the state controlled historically large areas of land is important to underline in this context, yet agricultural development in Nepal has not been hampered by the lack of property rights on land. On the contrary, for many decades, land concentration under secure property rights has been the main cause of rural poverty and low level of education.

Second, as a corollary to the analysis of economic development in Nepal, the study implies that colonialism is not the only cause of under-development, deep inequalities and abject poverty: Nepal has never been formally colonized. Other institutions, such as an absolute monarchy that controlled the main means of production; an inhospitable geography that severely limited the supply of arable land, hence hampered agriculture; and a cast system that inhibited human capital accumulation across the population as well as ethnic and linguistic fragmentations that created regional identities, are the main forces that have inhibited economic growth. Third, a well-educated urban elite notwithstanding, the fact that mass education has remained limited in Nepal demonstrates that human capital accumulation cannot be separated from the underlying political institutions themselves. The econometric analysis, on the other hand, shows foreign aid has been beneficial for economic development. Earlier attempts to introduce political and economic reforms have not substantially changed the dynamics of development and it is too early to assess the impact of the 2007 revolution on growth in Nepal.

References

Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of Political Economy, 113*, 949–995. http://dx.doi.org/10.1086/432166

Acemoglu, D., & Robinson, J. (2006). *Economic origins of dictatorship and democracy*. Cambridge, Mass: Cambridge University Press.

Acharya, B. (2008). *Land tenure and land registration in Nepal*. Integrating Generations, FIG Working Week, Stockholm, Sweden.

Alesina, A., & Dollar, D. (2000). Who gives foreign aid to whom and why? *Journal of Economic Growth, 5*, 33–63. http://dx.doi.org/10.1012/A:1009874203400

Alesina, A., & Rodrik, D. (1994). Distributive politics and economic growth. *Quarterly Journal of Economics, 108*, 465–490. http://dx.doi.org/10.2307/2118470

Asian Development Bank (ADB), Department for International Development (DFID), and International Labour Organization (ILO). (2009). *Nepal: Critical development constraints*. Mandaluyong City, Philippines: Asian Development Bank.

Basnett, Y. (2009). *From politicization of grievances to political violence: An analysis of the Maoist movement in Nepal*. Development Destin Studies Institute, London School of Economics and Political Science, Working paper, No: 07–78.

Benarjee, A., & Ghatak, M. (2005). Symposium on institutions and economic performance. *Economics of Transition, 13*, 421–425. http://dx.doi.org/10.1111/j.1468-0351.2005.00232.x

Bhattacharyya, S. (2009). Unbundled institutions, human capital, and growth. *Journal of Comparative Economics, 37*(1), 106–120. http://dx.doi.org/10.1016/j.jce.2008.08.001

Bhattarai, B. (2009). Foreign aid and growth in Nepal: an empirical analysis. *Journal of Developing Areas, 42*, 283–302. http://dx.doi.org/10.1353/jda.0.0026

Blattman, C., & Miguel, E. (2010). Civil war. *Journal of Economic Literature, 48*, 3–57. http://dx.doi.org/10.1257/jel.48.1.3

Boone, P. (1995). Politics and the effectiveness of foreign aid. *European Economic Review, 40*, 289–329. http://dx.doi.org/10.1016/0014-2921(95)00127-1

Brown, L. T. (1996). *The challenge to democracy in Nepal: A political history*. London and New York: Routledge. http://dx.doi.org/10.4324/9780203419649

Burnside, C., & Dollar, D. (1997). Aid, policies, and growth. *American Economic Review, 90*, 847–868. http://dx.doi.org/10.1257/aer.90.4.847

Carl-Johan, D., Hansen, H., & Tarp, F. (2004). On the empirics of foreign aid and growth. *The Economic Journal, 114*, 191–216. http://dx.doi.org/10.1111/j.1468-0297.2004.00219.x

Deraniyagala, S. (2005). The political economy of civil conflict in Nepal. *Oxford Development Studies, 33*, 47–62. http://dx.doi.org/10.1080/13600810500099659

Easterly, W. (2003). Can foreign aid buy growth? *The Journal of Economic Perspectives, 17*, 23–48. http://dx.doi.org/10.1257/089533003769204344

Failed States Index. (2013). *Fund for Peace*. Retrieved from http://www.foreignpolicy.com/failed_states_index_2013_interactive

Galor, O., Moav, O., & Vollrath, D. (2009). Inequality in land ownership, the emergence of human capital promoting institutions and the great divergence. *Review of Economic Studies, 76*, 143–179. http://dx.doi.org/10.1111/j.1467-937X.2008.00506.x

Glaeser, E., & Shleifer, A. (2002). Legal origins. *Quarterly Journal of Economics, 117*(4), 1193–1229. http://dx.doi.org/10.1162/003355302320935016

Grief, A. (1994). Cultural beliefs and the organization of society: An historical and theoretical reflection on collectivist and individualist societies'. *Journal of Political Economy, 102*, 912–50. http://dx.doi.org/10.1086/261959

Grossman, H. I. (1991). A general equilibrium model of insurrections. *American Economic Review, 81*, 12–21.

Hansen, H., & Tarp, F. (2000). Aid effectiveness disputed. *Journal of International Development, 12*, 375–398. http://dx.doi.org/10.1002/(SICI)1099-1328(200004)12:3<375::AID-JID657>3.0.CO;2-M

Hansen, H., & Tarp, F. (2001). Aid and growth regressions. *Journal of Development Economics, 64*(2), 547–570. http://dx.doi.org/10.1016/S0304-3878(00)00150-4

Hsiang, S., Meng, K., & Cone, M. (2011). Civil conflicts are associated with the global climate. *Nature, 476*, 438–411. http://dx.doi.org/10.1038/nature10311

Kalemli-Ozcan, S., Ryder, H. E., & Weil, D. N. (2000). Mortality decline, human capital investment, and economic growth. *Journal of Development Economics, 62*, 1–23. http://dx.doi.org/10.1016/S0304-3878(00)00073-0

Khadka, N. (1991). *Foreign aid, poverty and stagnation in Nepal*. Vikash Publishing House Pvt. Ltd.

Knack, S. (2004). Does foreign aid promote democracy? *International Studies Quarterly, 48*, 251–266. http://dx.doi.org/10.1111/j.0020-8833.2004.00299.x

Mankiw, G., Romer, D., & Weil, D. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics, 107*, 407–438. http://dx.doi.org/10.2307/2118477

Miguel, E., Satyanath, S., & Sergenti, E. (2004). Economic shocks and civil conflicts; an instrumental variable approach. *Journal of Political Economy, 112*, 725–753. http://dx.doi.org/10.1086/421174

Nepal, M., Bohara, A., & Gawande, K. (2011). More inequality, more killings. *American Journal of Political Science, 55*, 886–906. http://dx.doi.org/10.1111/j.1540-5907.2011.00529.x

Nepal. (2014, March). In Wikipedia, the free encyclopedia. Retrieved March 17, 2014, from http://en.wikipedia.org/wiki/Nepal

North, D. (1981). *Structures and change in economic history*. New York, NY: Norton.

Olson, M. (1963). *The logic of collective action*. Cambridge, Mass: Harvard University Press.

Pack, H., & Pack, J. R. (1993). Foreign aid and the question of fungibility. *The Review of Economics and Statistics, 75*, 258–265. http://dx.doi.org/10.2307/2109431

Phillips, P., & Hansen, B. (1990). Statistical inference in instrumental variables regression with I(1) processes. *Review of Economic Studies, 57*, 99–125. http://dx.doi.org/10.2307/2297545

Pincus, S. (2009). *1688: The first modern revolution*. New Haven, Connecticut: Yale University Press.

Rajan, R., & Subramanian, A. (2011). Aid, dutch disease, and manufacturing growth. *Journal of Development Economics, 94*, 106–118. http://dx.doi.org/10.1016/j.jdeveco.2009.12.004

Rodrik, D. (1996). Understanding economic policy reform. *Journal of Economic Literature, 34*, 9–41.

Rodrik, D. (2007). *Globalization, institutions and economic growth*. Princeton, NJ: Princeton University Press.

Roemer, J. E. (1985). Rationalizing Revolutionary Ideology. *Econometrica, 53*, 85–108. http://dx.doi.org/10.2307/1911726

Shakya, S. (2009). *Unleashing Nepal past, present and future of the economy*. Penguin Books.

Sharma, K. (2006). The political economy of civil war in Nepal. *World Development, 34*, 1237–1253. http://dx.doi.org/10.1016/j.worlddev.2005.12.001

Sharma, S. (1999). *Land tenure and poverty in Nepal.* Paper presented in the World Development Report 2000 Consultation Meeting organized by the World Bank, April 1999, Dhaka. Manuscript.

Skocpol, T. (1979). *States and social revolutions.* Cambridge: CambridgeUniversity Press.

Svensson, J. (2000). When is foreign aid policy credible? Aid dependence and conditionality. *Journal of Development Economics, 61*, 61–84. http://dx.doi.org/10.1016/S0304-3878(99)00061-9

Tierney, J., Nielson, D., Hawkins, D., Roberts, J., Findley, M., Powers, R., & Parks, B. (2012). More dollars than sense: Defining our knowledge of development finance using aid data. *World Development, 39*, 1891–1906. http://dx.doi.org/10.1016/j.worlddev.2011.07.029

Trumbull, W., & Wall, H. (1994). Estimating aid-allocation criteria with panel data. *The Economic Journal, 104*, 876–882. http://dx.doi.org/10.2307/2234981

Vaniak, A. (2007). The new Himalayan republic. *New Left Review, 49*, 46.

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