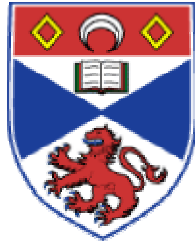


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Contracting Institutions and Growth*

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ABSTRACT

We follow Acemoglu and Johnson (2005) in disentangling the effects of contracting and property rights institutions on average growth rates over the period 1985–2004 in addition to the log level of per capita income in 1995. On the basis of 2SLS results, we find a robust, positive link between the quality of some contracting institutions and the rate of economic growth and a robust, *negative* link between contracting institutions and the level of output. We interpret these conflicting results as evidence for a trade-off in the effect of contracting institutions on growth and income levels. We look to rationalize this apparent trade-off in terms of a framework where transactions costs are endogenous to investments made in contracting technologies.

JEL Classification: O11, O40, O43.

Keywords: Economic growth, institutions.

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1 Introduction

The importance of institutions in determining economic growth has become a key debate. Knack and Keefer (1995), Hall and Jones (1999), Easterly and Levine (2003), Rodrik et al. (2004) and Glaeser et al. (2004) have all looked to understand the empirical importance of institutional quality in determining economic growth. Acemoglu and Johnson (2005) unravelled the relative importance for economic outcomes of two distinct types of institutions. Following North (1981), Acemoglu and Johnson labelled institutions that affect transactions costs and the costs of forming contracts as ‘contracting institutions’ and those which determine the security of private property ‘property rights institutions’.

There are a number of reasons to think that each type of institution could determine economic outcomes. The transactions cost literature after Coase (1960) and Williamson (2000) argues that poor contracting institutions limit the ability of private agents to settle disputes, to diversify against risks, to form large markets and to choose optimal organizational structures. Contracting institutions, in this view, are directly related with income levels and growth rates. Alongside contracting institutions, the importance for development of securing property rights has been raised by De Soto (2001), while the potential economic consequences of the power of minority elites has been put forcefully by Acemoglu and Robinson (2006). The quality of property rights institutions should also, then, be expected to affect economic outcomes.

Many papers on institutions and growth consider the role of institutions in determining the level of GDP per capita in a given single year, as a measure of long-run growth.¹ In this paper, we follow Acemoglu and Johnson (2005) (henceforth

¹A notable exception is Glaeser et al. (2004), which finds little evidence for the role of institutions as separate from measures of human capital. In dynamic panel analysis, Bhattacharyya (2009) has found an independent role for both human capital and institutions in explaining growth. We omit human capital as a control variable in our estimations, because of multicollinearity, so our estimates will likely be upper bounds on the effects of institutions.

AJ) in distinguishing between contracting and property rights institutions, but we look, in addition to log GDP per capita, at the role of institutions in explaining differences in contemporaneous growth rates.

AJ find strong evidence that property rights institutions can be robustly related to various economic outcomes, particularly income per capita, while contracting institutions cannot. A higher quality of contracting institutions, where significant, is found to *decrease* the level of income per capita. AJ (p.953) conclude,

Countries with greater constraints on politicians and elites and more protection against expropriation by these powerful groups have substantially higher income per capita... Once we control for the effects of property rights institutions, contracting institutions seem to have no impact on income per capita.

One intuition, suggested in AJ, is that the consequences of poor contracting institutions can be avoided or ameliorated by flexible private choices of contracting type (indeed, a robust relationship between contracting institutions and financial structure is found). In contrast, a powerful elite with the ability to steal outputs or distort factor prices is hard to mitigate in a decentralized fashion.

The object of this paper is to explore the role of institutions in determining modern growth. Common proxies for institutions are contemporaneous, rather than historical, measures of the contracting and property rights institutions in each country. Since institutions do change over time and across countries (as Glaeser et al. (2004) highlight), this paper is interested in the connection between institutions and contemporaneous average growth rates.

We find a significant role for contracting institutions in determining contemporaneous growth rates and little role for property rights institutions. A better current environment for contracts appears to lead to higher current growth rates. In addition, we find that the significance of contracting institutions in decreasing

income per capita is a more general finding across the proxies and instruments used in AJ. These two results together leaves a puzzle. At the end of the paper, we attempt to account for this apparent contradiction by suggesting that transactions costs are the product of investments in institutions that facilitate transactions, that is, they are endogenous. Low transactions costs can increase growth, but they come at the cost of resources allocated away from other *directly* productive activities.² We leave most of the discussion of this potential explanation to the concluding sections.

In Section 2 we describe the data and empirical strategy, giving our main results based principally on the data used in AJ. We establish the importance for growth rates of each type of institution, and elaborate upon the results in AJ in relation to 1995 GDP per capita levels. In Section 3 we check the robustness of these results against some newer data for contracting institutions, and present results from regressions conditioning on other potential growth and income determinants. In Section 4 we argue that the results on the affect of contracting institutions on growth and income levels may have a very natural interpretation. Section 5 offers some concluding remarks.

2 Estimating the Effect of Institutions on Output and Growth

We first mirror AJ by running 2SLS regressions with a sample restricted to former colonies using three proxies for each type of institution, one instrument for contracting and two instruments for property rights institutions; we report results for all permutations. The dependent variables are the log of the level of per capita GDP in 1995 and the average growth rate of per capita GDP over the period 1985–2004.

²In a general equilibrium framework, Nolan and Trew (Forthcoming) makes a similar argument that there can be a trade-off between investments in contracting institutions that facilitate the low exchange costs which promote risk-sharing, and the expected level of consumption.

The three proxies for the quality of contracting institutions are measures of the number of procedures and of procedural complexity from World Bank (2004), and an index of legal formalism from Djankov et al. (2003). Each proxy is inversely related to contractual quality, so should be negatively related with economic outcomes. For property rights, AJ employ the measure of protection against expropriation averaged over 1985-1995 used in Knack and Keefer (1995), a 1990s average of the constraint on executive power from Polity IV (2006), and a measure of the degree of protection of private property from Gwartney and Lawson (1997).

AJ (their Table 2) find that OLS regressions using the institutional proxies reveal significant univariate correlations between institutional proxies and income per capita, investment to GDP ratio and stock market capitalization and the ratio of private credit to GDP. Better contracting and a greater degree of security of rights over property can be associated with each economic outcome. We could proceed to use OLS to estimate the effect of both types of institutions on the outcome variables. An immediate problem in interpreting such results is that both sets of institutional proxies are likely endogenous, so reverse causality or the effect of omitted variables could be showing up in the OLS coefficients. Moreover, likely measurement error in the proxies introduces downward bias to the estimated coefficients and, where they are correlated, that variable measured with greatest error will appear more significant.

In a major contribution of that paper, AJ addresses both issues by establishing that historical data from colonial settlements can be used with legal origins data to instrument for each type of institution. They then use a 2SLS procedure to obtain unbiased results and to separate out the distinct relationships of each type of institution on each economic outcome variable.

The instrument for contracting institutions is a dummy variable for whether the country has a civil or common law tradition. The legal origins literature, such as La Porta et al. (1998), argues that an historical tradition of common law is

correlated with institutions that better enforce private contracts. Djankov et al. (2003) show the strong connection between legal origin and their measure for legal formalism. The instruments for property rights institutions are the mortality rates of colonial settlers and population density in each country in year 1500. Acemoglu et al. (2001) showed that higher mortality rates among colonial settlers meant that they were more likely to install extractive institutions with greater centralisation of power in a governing elite. Acemoglu et al. (2002) found that colonial settlers who found dense local populations were more likely to establish authoritarian systems of governance. Both sets of historical data are also capable of predicting the nature of present day property rights institutions.

The first stage regressions for testing the validity of these instruments in separating out each type of institution are given in AJ Table 3. It is shown that the legal origins instrument is significantly correlated with proxies for contracting institutions, but not with those for property rights. The settlement data is significantly correlated with proxies for property rights institutions, and not with those for contracting institutions.³ The use of both instruments in the 2SLS procedure thus enables AJ to isolate the separate effects of each type of institution of economic outcomes.

2.1 Empirical Results

One limitation of using historical instruments based on colonial settlements is that our IV estimates must be based on the sub-sample comprised of former colonies. As a simple check of the consistency of estimated correlations, Table 1 presents the univariate correlations between average growth in GDP per capita over 1985–2004

³We omit the first stage results here to avoid simply duplicating the results in AJ. They regress each of the six institutional proxies against legal origin with log settler mortality and legal origin with log population density. The explanatory power of the instruments is generally strong (median $R^2 = 0.37$) and in all cases the legal origin (log settler mortality or population density) is strongly correlated with the contracting (property rights) proxy. The legal origin dummy is significantly correlated with the expropriation protection and private property variables, but much less strongly so.

and the various institutional proxies.

Table 1: Institutions and Average Growth of GDP Per Capita 1985–2004

	world	former colonies	
	OLS	OLS	2SLS
degree of formalism	-0.37** (0.13)	-0.38** (0.12)	-0.51** (0.21)
procedural complexity	-0.18 (0.12)	-0.16 (0.14)	-0.44* (0.22)
number of procedures	-0.05** (0.01)	-0.06** (0.02)	-0.07** (0.03)
exec. constraint	0.28** (0.10)	0.27** (0.11)	0.61** (0.22)
exprop. protection	0.44** (0.10)	0.45** (0.14)	0.94** (0.40)
private prop.	0.46** (0.14)	0.47** (0.18)	1.08** (0.40)

N.B. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. For the 2SLS results, the instrument used for property rights is log settler mortality; that for contracting institution is a dummy variable equal to one for each English colony.

As can be seen from the OLS results (columns 1 and 2 of Table 1), there does not appear to be much difference across samples in the correlation between the institutional proxies and the average rate of growth. This is mirrored in the univariate regressions on log GDP per capita in 1995 (see AJ Table 2). The sample of former colonies appears to be a representative sample for our purposes. Coefficients are generally significant and always of the expected sign. When we instrument for each proxy, IV estimates generally preserve or reenforce the univariate significance of each proxy in explaining variation in growth rates. For log GDP per capita, coefficients estimated using IV are more significant in the case of property rights institutions, and less significant for contracting institutions.

Given the problems noted above, OLS regression results are not reliable, and univariate 2SLS results will likely suffer from omitted variable bias. Tables 2 and 3

give second stage 2SLS results using both sets of institutional data. The dependent variable is, respectively, the log of GDP per capita in 1995 and the average growth rate of GDP per capita over 1985–2004. Panel A of each table refers to results using the log of population density in 1500 as an instrument for property rights institutions; Panel B gives results using the log of settler mortality. In all regressions, the instrument for contracting institutions is a dummy variable for whether the country has a civil or common law history. In each cell the left (right) hand numbers are the coefficients on the respective contracting (property rights) institution.

Table 2: Institutions and Log GDP Per Capita in 1995 (2SLS results)

Panel A: Log Population Density						
	exec. constraint		expropr. protection		private prop.	
degree of formalism	-0.002 (0.21)	0.88** (0.28)	0.44** (0.20)	1.09** (0.22)	0.47** (0.19)	1.42** (0.25)
procedural complexity	0.12 (0.14)	0.73** (0.19)	0.39** (0.15)	1.07** (0.18)	0.39** (0.13)	1.26** (0.23)
number of procedures	0.02 (0.02)	0.72** (0.19)	0.07** (0.03)	1.00** (0.19)	0.06** (0.02)	1.23** (0.27)

Panel B: Log Settler Mortality						
	exec. constraint		expropr. protection		private prop.	
degree of formalism	0.05 (0.24)	0.99** (0.28)	0.35** (0.16)	0.99** (0.15)	0.85** (0.36)	2.45** (0.60)
procedural complexity	0.10 (0.16)	0.84** (0.18)	0.35** (0.13)	1.02** (0.13)	0.73** (0.30)	2.02** (0.49)
number of procedures	0.02 (0.04)	0.88** (0.21)	0.09* (0.05)	1.20** (0.29)	0.13** (0.05)	2.21** (0.52)

N.B. The left (right) hand numbers in each cell are the coefficients on the respective contracting (property rights) institution. Results in bold are those reported in AJ. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. Results are for the sample of former colonies. The instrument for contracting institution is always a dummy variable equal to one for each English colony. The number of observations varies between 51 and 69 according to data availability for each proxy and each instrument.

The results for the relationship between property rights institutions and log GDP per capita are significant and of the expected sign for all permutations of proxies and instruments. This is the remarkable finding of AJ: More secure property

rights, and greater constraints on executive power, have a first order and positive impact on income per capita. Across most permutations of proxies, the effect of contracting institutions on GDP per capita is also strong. In all regressions except those where the degree of executive constraint is used as a proxy for property rights, the contracting institution is a significant determinant of log GDP per capita.⁴ The sign of this relationship is, however, unexpected. The coefficient on contracting institutions is always positive (except for a -0.002). Countries with more complex or more lengthy contractual processes appear to have *higher* per capita incomes. There are a number of ways to rationalize such a finding, but it is better to do so in the context of the results in regard to growth and following robustness checks; we leave a full discussion to Section 4.

The sign of the estimated coefficient on contracting institutions is negative for all permutations of proxies and instruments; that is, a better contracting environment is associated with higher rates of growth. When log population density is used to instrument for property rights, the coefficient on contracting institutions is always significant.⁵ The effect of property rights is inconsistent in sign and weakly significant in only three of the eighteen permutations. When we instrument for property rights using log settler mortality, the results are not consistently significant. However, using all three instruments in the 2SLS procedure yields results that are very close to those in Panel A and do not appear to suffer from problems of overidentification.⁶

On the basis of the IV estimates above, contracting institutions appear to be a robust determinant of both the level of GDP per capita and its average rate of

⁴Including executive constraint appears to bias downwards the estimated coefficient on contracting institutions in the other regressions on log GDP per capita reported in Section 3.

⁵Of note here, using the executive constraint proxy does not appear to bias the coefficient on contracting institutions as previously.

⁶When we instrument using log population density, log settler mortality and legal origin, eight of the nine permutations obtain a significant and negative coefficient on contracting institutions, seven at the 5% level of significance. In five of the seven permutations with significance at 5%, we fail to reject the null hypothesis of the Sargan test for overidentification.

Table 3: Institutions and Average Growth, 1985–2004 (2SLS results)

Panel A: Log Population Density						
	exec. constraint		expropr. protection		private prop.	
degree of formalism	-0.55** (0.27)	-0.40 (0.28)	-0.71** (0.32)	-0.44 (0.34)	-0.75** (0.31)	-0.73* (0.37)
procedural complexity	-0.47* (0.26)	-0.18 (0.23)	-0.52* (0.31)	-0.21 (0.36)	-0.68** (0.27)	-0.46 (0.35)
number of procedures	-0.08** (0.04)	-0.13 (0.20)	-0.09** (0.04)	-0.12 (0.28)	-0.10** (0.03)	-0.40 (0.32)

Panel B: Log Settler Mortality						
	exec. constraint		expropr. protection		private prop.	
degree of formalism	-0.59** (0.22)	0.16 (0.26)	-0.53** (0.22)	0.14 (0.25)	-0.34 (0.31)	0.61 (0.59)
procedural complexity	-0.36 (0.26)	0.46* (0.26)	-0.22 (0.28)	0.59* (0.35)	-0.38 (0.28)	0.66 (0.49)
number of procedures	-0.07* (0.04)	0.32 (0.22)	-0.06 (0.05)	0.48 (0.34)	-0.06 (0.04)	0.57 (0.45)

N.B. The left (right) hand numbers in each cell are the coefficients on the respective contracting (property rights) institution. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. Results are for the sample of former colonies. The instrument for contracting institution is always a dummy variable equal to one for each English colony. The number of observations varies between 51 and 69 according to data availability for each proxy and each instrument.

growth, but in opposite directions. While a better contracting institution increases the growth rate, it reduces the level of income per capita. We come to a discussion of these results in Section 4, after conducting a number of robustness checks in the next Section.

3 Robustness Checks

In order to check the validity of the results presented above, we can consider recently published proxies for contracting institutions from Djankov et al. (2008). We also present results of the second stage 2SLS regressions when we condition on other potential growth and income determinants.

Table 4: First Stage Regressions for Djankov et al. (2008) Contracting Institutions

	efficiency		time		time to pay		cost	
legal origin	0.34** (0.07)	0.30** (0.07)	-2.24** (0.34)	-2.23** (0.39)	-2.09** (0.35)	-2.08 (0.41)	-0.03 (0.03)	-0.02 (0.04)
log mortality		-0.08** (0.03)		0.03 (0.14)		-0.005 (0.14)		0.02 (0.02)
log pop. density	-0.02 (0.02)		0.06 (0.08)		0.06 (0.09)		0.01** (0.005)	
R^2	0.50	0.56	0.45	0.43	0.43	0.39	0.13	0.12
Obs.	35	32	35	32	35	32	35	32

N.B. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. All regressions are based on the 35 former colonies with Djankov et al. (2008) data. Legal origin is a dummy equal to one when the country has an English legal history. The efficiency variable is that in Djankov et al. (2008) divided by 100.

3.1 Djankov et al. (2008) Debt Enforcement Data

Djankov et al. (2008) present survey responses to a hypothetical case study of an hotel company called ‘Mirage’. Lawmakers are questioned about the likely legal outcome for the company when it is unable to pay its single creditor. Results include data on the time it takes between default and final decision, the time between default and payments to the creditor and the estimated cost of debt enforcement. Using private sector lending rates, reported likely time and expected costs, Djankov et al. (2003) calculate in addition a measure of efficiency, the present value of the eventual worth of the firm after costs. Each of these variables can be considered as proxies for the quality of contracting institutions. Table 4 gives first stage results when we consider each of these variables against potential instruments in the sample of former colonies.

The samples are smaller than before, but we can still see that legal origin still works as a strong instrument across all of the proxies except the cost of enforcement, with significant coefficients of the expected sign⁷ and good explanatory power.

⁷Note that the efficiency variable is a measure of contractual quality, while time and time to pay are measures of contractual impediments, so we expect different signs.

Moreover, log population density does not correlate with the first three proxies. As such, we drop the cost variable, and proceed in Table 5 to 2SLS results using the three new proxies for contracting institutions.

Table 5: Djankov et al. (2008) Proxies and GDP Per Capita, Growth (2SLS results)

Panel A: Log GDP Per Capita, 1995						
	exec. constraint		expropr. protection		private prop.	
efficiency	0.56 (0.96)	0.54** (0.18)	-2.64 (1.74)	1.08** (0.36)	-2.53** (1.11)	1.44** (0.29)
time	-0.08 (0.15)	0.55** (0.18)	0.36 (0.25)	0.98** (0.31)	0.38** (0.18)	1.39** (0.28)
time to pay	-0.09 (0.16)	0.55** (0.18)	0.40 (0.28)	0.99** (0.32)	0.42** (0.20)	1.42** (0.29)

Panel B: Average GDP Per Capita Growth, 1985–2004						
	exec. constraint		expropr. protection		private prop.	
efficiency	3.81** (1.87)	-0.41 (0.32)	6.42 (3.92)	-0.76 (0.75)	6.07* (3.57)	-1.20 (0.91)
time	-0.56** (0.27)	-0.35 (0.27)	-0.89* (0.52)	-0.52 (0.58)	-0.90* (0.52)	-1.07 (0.81)
time to pay	-0.60** (0.30)	-0.37 (0.29)	-0.97 (0.62)	-0.56 (0.64)	-1.01 (0.63)	-1.15 (0.91)

N.B. The left (right) hand numbers in each cell are the coefficients on the respective contracting (property rights) institution. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. Results are for the sample of former colonies. The instrument for contracting institution is always a dummy variable equal to one for each English colony; that for property rights is always log population density. The number of observations varies between 32 and 35. The efficiency variable is that in Djankov et al. (2008) divided by 100.

As can be seen from Table 5, results using the new proxies are broadly the same as those with the original proxies. Sample sizes are smaller, so we cannot expect the consistency of results as before but we do get significant effect of property rights institutions on the level of GDP per capita for all permutations (though for these proxies, this is essentially a sub-sample of data that we already know to exhibit that relationship). The new data are proxies for contracting institutions and the effect of better contracting institutions increasing growth is apparent in 6 of the 9 permutations, and is always of the sign we expect. For log GDP per capita, the

proxies for contracting institutions are mostly of the same sign as previously, and are significant in three of the permutations.

3.2 Control Variables

We present in Table 6 the results of 2SLS estimates of the effect of institutions when we control for a number of other macroeconomic factors used in AJ, specifically log average inflation, the share of government spending and a measure of exchange rate overvaluation.

Table 6: Second Stage Results for Institutions, Log GDP Per Capita and Growth with Macroeconomic Control Variables

	Log GDP per cap.	Growth	Log GDP per cap.	Growth	Log GDP per cap.	Growth	Log GDP per cap.	Growth
formalism	0.46* (0.25)	-0.60* (0.31)			0.26* (0.15)	-0.57** (0.27)		
complexity			0.41* (0.22)	-0.41 (0.33)			0.25** (0.11)	-0.45* (0.24)
expropr.	1.17** (0.40)	-0.17 (0.46)	1.19** (0.41)	-0.27 (0.63)				
private prop.					1.02** (0.20)	-0.11 (0.39)	1.05** (0.17)	0.03 (0.39)
avg. inflation	0.13 (0.14)	0.16 (0.18)	0.45 (0.13)	0.03 (0.28)	-0.11 (0.11)	0.20 (0.17)	-0.11 (0.11)	0.21 (0.17)
gov. share	-1.23 (5.46)	12.00* (6.92)	-1.34 (4.90)	4.04 (11.11)	-6.39** (1.92)	8.32 (5.16)	-6.58** (1.95)	9.27* (5.45)
exch. rate	0.00 (.006)	-0.02** (.007)	.002 (.006)	-0.03 (.008)	-.001 (.003)	-0.02 (.006)	-.001 (.003)	-0.02** (.006)
Obs.	41	41	43	43	41	41	41	41

N.B. ** and * denote significance at 5 and 10% respectively. Numbers in parentheses are heteroscedasticity consistent (White) standard errors. Results are for the sample of former colonies. The instrument for contracting institution is always a dummy variable equal to one for each English colony; that for property rights is always log population density at 1500.

As can be seen by the results in Table 6, our previous conclusions about the interactions between growth, GDP per capita and institutions are robust to conditioning on these additional variables.⁸ Coefficients on each proxy are similar to

⁸Results conditioning on other potential determinants of growth, namely latitude from La Porta

those found in the baseline results and we find significance in line with that found previously. Again, we see that property rights institutions increase GDP per capita while contracting institutions reduce the level but increase the growth rate of GDP per capita.

4 A Trade-Off in Contracts?

Taken alone, the relationship between contracting institutions and the level of GDP per capita does appear as a puzzle. A simple resolution may be in the interpretation of the institutional proxies. It could be that the proxies for contracting do not measure a poor quality of contracting, but a greater *sophistication* of the contracting process – an environment characterized by more complex contracts might be so because it has more complex, higher value-added goods to trade; the number of procedures may be higher because of a greater specialization of the legal sector among those procedures. The finding would then appear to mirror the empirical results in Wallis and North (1986). That chapter found that what they define as the ‘transaction sector’ roughly doubled as a *proportion* of US GDP from 1870 to 1970. Not only did the sum of transaction-related activities grow along with the US economy, but they became more important as a share of the economy.

There are at least two problems with such an interpretation. First, AJ §VI show that the proxies for institutions are aligned with firm-level responses from managers asked specifically about *impediments* to doing business. In particular, the measure of legal formalism is correlated with the perceived quality of courts, the functioning of the judiciary and violations of property rights law. The proxy for

et al. (1999), an average of real openness from Heston et al. (2006) and the average ratio of private credit to GDP from Beck et al. (2000), are also consistent with reported findings. We omit controls for human capital proxies here. As pointed out by Glaeser et al. (2004), AJ and Bhattacharyya (2009), there is a high degree of multicollinearity between institutions and measures of human capital. This makes inference difficult in cross-country regressions that include both. Bhattacharyya (2009) shows that in dynamic panel estimates which separate out human capital from institutions, a robust role for both human capital *and* institutions is preserved.

property rights, the constraint on the executive, is not correlated with these firm-level measures. AJ infer that the measures of contracting institutions are indeed proxies for contractual impediments.⁹ Second, this explanation does not help to explain the finding that contracts are related to growth in the opposite direction. If reversing the interpretation of the contracting proxies is appropriate, we are left with needing to explain why better contracting environment reduces growth rates. A more plausible interpretation must be based upon the view that the proxies for contracting institutions are picking up impediments in the contracting environment.

The data suggest, then, that better contracting institutions can reduce the level of per capita income at the same time as increasing its growth rate. This appears contradictory, but might be understood in a framework where: i) Low transactions costs benefit growth; and, ii) the costs of transacting are endogenous to investments made into technologies that reduce them. The first point is a theoretical prediction of some models with costly intermediation, such as Greenwood and Jovanovic (1990), Yang and Borland (1991), Bencivenga et al. (1995) and Townsend and Ueda (2006). The second point, and its implications, is less well established. It is based upon appreciating that achieving a better contracting environment can be costly. As Coase (1992, p.716) argued, “a large part of what we think of as economic activity is designed to accomplish what high transactions costs would otherwise prevent.”

What sorts of investments affect the costs of making exchanges? Consider setting up codes of conduct, funding agencies of prudential supervision, or maintaining a legal system that facilitates the enforcement of contracts. Each of these are costly to set up, and also costly to *draw upon* when writing specific contracts, regulating individual financial companies or resolving particular disputes. Importantly though, the upfront investment is inversely related to the costs of particular trans-

⁹These results also go some way to accounting for the concerns of Glaeser et al. (2004) that a number of proxies for institutional quality are inappropriate.

actions. Investments that reduce the costs of exchange can increase the growth rate but also mean the allocation of resources away from other productive activities, and so lower levels of income in the short-run.¹⁰ At the same time, what we think of as the costs of exchange, the number and complexity of procedures, and so on, are themselves part of a legal services sector that enters into measures of output. So high income per capita and a poor contracting environment can co-exist because, first, there is little wealth allocated away from production to activities that reduce the costs of transacting, and, second, there is a larger component in measured output consisting of covering the transactions costs that arise because of the lack of investment.

The implication of making the cost of exchange endogenous is that there is a trade-off in the quality of contracting between income levels today and growth rates today (income levels in the future). Improving the quality of contracts comes at a cost in terms of income, but benefits growth over the long run. We leave to future work a fuller theoretical exploration of this trade-off in the context of economic growth.

5 Concluding Remarks

This paper has presented apparently contradictory empirical findings on the role of contracting institutions in the level and growth rate of per capita output. It appears that good contracting institutions are positively related with the rate of economic growth at the same time as they are negatively related with the level of per capita output. First, this supplements the empirical findings of Acemoglu and

¹⁰An analogous argument in a general equilibrium model of endogenous transactions costs and risk-sharing is presented in Nolan and Trew (Forthcoming). A corollary of making exchange costs endogenous is that while transactions costs can be too high, they can also be too low. We discuss the conditions under which the efficient allocation may be decentralized, even though some institutions are public goods. We consider the quantitative implications against empirical estimates of the transaction sector (such as Wallis and North (1986)) and look at the effect of distortive institutions on private investments in exchange, market size and welfare.

Johnson (2005) and suggests that contracting institutions can have a first-order, and in some ways counter-intuitive, impact on a number of additional economic outcomes. Second, the apparent trade-off is difficult to square with the traditional approach of exogenous transactions costs in which better contracting institutions should always improve economic outcomes. We have attempted to rationalize our finding in terms of a trade-off in the gains and losses from improving contracting institutions, that is, where transactions costs are endogenous.

This apparent trade-off in contracting has implications for our understanding of how bad institutions might persist. An elite that fears a richer society would be better able to depose it might use policies aimed at contracting institutions to consolidate its position. That this enables higher income levels in the short-run makes the policy less likely to invoke revolution in the short-run and reinforces the elite's hold on power. In contrast, a move by alternative leaders to improve the growth rate via the contracting institutions can lower incomes in the short-run, making an attempt at exiting a low-growth, poor-contracting equilibrium more difficult.

The interpretation in terms of contracting institutions is largely suggestive, and no doubt other interpretations exist. Although a similar argument has been formalized in a framework of endogenous transactions costs and diversification against risk (see Nolan and Trew, Forthcoming), the exact political economy implications in a model with growth remain to be seen. Moreover, as Rodrik et al. (2004, p.153) points out, 'an instrument does not a theory make'.

The validity of our empirical results is based on the quality of the instruments used and on the appropriateness and interpretation of the proxies for institutions. Though we have conducted a number of tests for the robustness of these findings, there is still a great deal that can be investigated in both firm-level analyses and larger cross-country datasets.

Part of the problem in both the theory and measurement of the relationship

between contracting institutions and economic outcomes is in *defining* what transactions costs are. We have suggested that transactions costs can be thought of as part *ex ante* investments in technologies that reduce the costs of exchange and part *ex post* costs of exchange themselves. The implication for measurement is that the conception of a transaction sector, as in Wallis and North (1986), may be too broad. For theoretical analyses, we need to understand, more generally, whether treating the costs of exchange as endogenous to private decisions about investments in institutions really does make a difference to the qualitative implications of models that typically invoke exogenous transactions costs.

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Table 7: List of Variables and Sources

Variable	Description	Source
Expropriation protection	A score of the risk of expropriation of a private foreign investments, between 0 (highest risk) and 10 (lowest risk)	From Political Risk Services, 1999. Used in Knack and Keefer (1995).
Private property	A score indicating the extent of protection of private property from 1(very low) to 5 (very high)	Gwartney and Lawson (1997)
Legal origin	A dummy equal to one when the country had an English legal tradition implanted by colonization by the British	La Porta et al. (1999)
Latitude	normalized absolute distance to equator	La Porta et al. (1999)
Credit to GDP ratio	1985-2004 average ratio of private credit by deposit money banks and financial institutions to GDP	Beck et al. (2000)
Mortality	A measure of mortality among European settlers before 1850	Acemoglu et al. (2001)
Population density	A measure of population density in 1500	Acemoglu et al. (2002)
Legal formalism	An updated version of the legal formalism index, indicating the formality of legal procedures for collecting on a bounced cheque	Djankov et al. (2003)
Real exchange rate overvaluation	A measure of exchange rate overvaluation, average over 1960-98	Acemoglu et al. (2003)
Procedural complexity	Index of the procedural complexity involved in collecting a commercial debt of 50% of per capita income (on a scale from 0 to 10 as in AJ)	World Bank (2004)
Number of procedures	Number of procedures involved in collecting a commercial debt of 50% of per capita income	World Bank (2004)
Real Openness	1985-2004 average of exports plus imports as a ratio of GDP in constant (2000) prices. Deleted countries with fewer than 10 observations for the period (Angola, Armenia, Azerbaijan, Belarus, Guyana, Kyrgyzstan, Libya, Seychelles).	Heston et al. (2006)
Growth	1985-2004 average of growth rate of real GDP per capita. Deleted countries with fewer than 10 observations for the period (Angola, Armenia, Azerbaijan, Belarus, Guyana, Kyrgyzstan, Libya, Seychelles).	Heston et al. (2006)
Executive constraints	1990-2000 average for constraint on executive. Treating flags for interregnums, transitions and foreign ‘interruptions’ as missing values	Polity IV (2006)
Time	The estimated duration, in years, from the moment of Mirage’s default to the point at which the fate of Mirage is determined	Djankov et al. (2008)
Time to pay	The estimated duration, in years, of the time from the moment of Mirage’s default to the point at which the secured creditor is anticipated to receive payment	Djankov et al. (2008)
Cost	The estimated cost of the insolvency proceeding for Mirage, reported as a percentage of the value of the insolvency estate, borne by all parties	Djankov et al. (2008)
Efficiency	The present value of the net worth of Mirage using data for the cost, time to resolution and the rate of interest on private debt in each country	Djankov et al. (2008)

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