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**Bonding Social Capital and Corruption:
A Cross-National Empirical Analysis**

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Bonding Social Capital and Corruption: A Cross-National Empirical Analysis

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Abstract:

This paper considers the relationship between corruption and bonding social capital, which is characterised by high level of particularised trust and reciprocity amongst families and close friends. The main conjecture is that bonding social capital is likely to increase corruption and that it affects corruption not only *directly*, but also *indirectly* through other factors. Empirical results from the third wave of the World Value Survey confirm that bonding social capital leads to higher level of perceived corruption, particularly public and political corruption, when it discourages trust and cooperation towards outsiders. Bonding social capital also increases corruption *indirectly* by reducing opportunistic behaviour and imposing peer pressure on the in-group members to reciprocate in a corrupt exchange i.e. to 'return the favour'. This mechanism makes a corrupt transaction more predictable, i.e. increasing the confidence that the 'goods' will be delivered as promised and thus, leads to high level of corruption.

Keywords: Corruption, Social Capital, Social Norms, Social Networks

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1 Introduction

Corruption is as an ancient and complex social phenomenon with multiple causes and consequences which are difficult to distinguish. Despite the great attempts made by researchers to identify factors which may give rise to corruption (Ades and Di Tella, 1997; 1999; della Porta and Vannucci, 1999; Gupta, Davoodi and Alonso-Terne, 1998; Gurgur & Shah, 2005; Kunicova & Rose-Ackerman, 2005; Mauro, 1995; Paldam, 1999; Rose-Ackerman, 1999; Shleifer and Vishny, 1993; Treisman, 2000), the causes of corruption remain ambiguous and not well understood (Advig et al., 2000; Jain, 2001; Lambsdorff, 1999, 2007; Seldadyo and de Haan, 2006). This ambiguity is underlined by the fact that corruption means different things in different countries and across different social environments.

Although the term 'corruption' is universally understood, there is hardly any agreement on where precisely the boundary between a corrupt and non-corrupt act should be drawn. This is because in practice what is considered as corrupt largely depends on the social norms and conventions within the society in question. Culture and social norms influence the individual's behaviour and their perception towards corruption and therefore, affect their decision whether to engage in corrupt activities. This effect is likely to be particularly strong within a society where personal ties amongst families and friends are highly valued. This is because within such a society, the norms of specific reciprocity and particularised trust towards the members of the 'in-group' are strictly enforced within the group, but these norms are not equally applied to the outsiders. This type of social environment helps to foster in-group favouritism, which can easily lead to corruption.

A concept which has emerged recently in order to explain the variation in the degree of social interaction, trust and reciprocity and has received increasing attention in the corruption literature is *Social Capital*. However, previous empirical studies of social capital and corruption have mainly looked at generalised trust and civic engagement as measures of social capital. These studies find that in societies where the level of generalised trust and civic engagement is high, people are more willing to deal with people who are different from them, encouraging cooperation towards those outside one's narrow social network. As a result, trusting societies are more likely to have efficient governments, higher level of economic development, and thus, less corruption (Bjornskov, 2004; La Porta et al., 1997; Uslaner, 2001; 2004; Zak and Knack, 2001). However, a number of scholars have also acknowledged that social capital does not always produce positive externalities (Fukuyama, 1995; 1999; Putnam, 2000; Putzel, 1997; Warren, 2001). In some societies, a high level of bonding social capital within group reduces the ability of group members to cooperate with outsiders, and even imposes negative externalities on the latter. But the extent to which bonding social capital within a

close-knit group affects the level of corruption has rarely been empirically examined. The study which examines a closely related concept to bonding social capital or personal ties is the work done by Lipset and Lenz (2002). The authors find that countries which have high level of familism¹ tend to be among the more corrupt.

This study builds upon the work of Lipset and Lenz, but will broaden the scope of the analysis by including arguably more representative measures of bonding social capital from the third wave of the World Value Survey. In addition, bonding social capital has been previously labelled as the ‘dark side’ of social capital (Fukuyama, 1995; 1999; Putzel, 1997). However, it could be argued that bonding social capital does not always lead to corruption. Whether bonding social capital will lead to corruption depends on whether it fosters in-group favouritism and discourages trust and cooperation towards outsiders or not. It is, therefore, important to distinguish not only between different kinds of social capital (bonding vs. bridging), but also between different types of bonding social capital. Specifically, this paper will examine two types of bonding social capital, namely ‘inward’ and ‘outward’ bonding social capital. The former represents the degree of closeness of one’s families and friends, whilst the latter characterises the extent to which bonding social capital within group discourages cooperation towards outsiders (the out-group). Empirical results show that bonding social capital affects corruption both *directly* and *indirectly* by making corruption more predictable, particularly when it discourages trust and cooperation of the in-group members towards outsiders (outward bonding social capital). These are the main contributions of this study to the literature on social capital and corruption.

The paper is structured as follow. The next section reviews related studies on social capital and corruption. Section 3 outlines the main contributions of this study. Section 4 explains the conceptual framework and empirical strategy. Section 5 describes the data, missing data and sampling issues and the extent to which they are dealt with. Section 5 discusses the main findings along with the diagnostic tests of the estimates. The final section concludes by outlining some policy implications which emerge from this study.

¹ A concept put forward by Edward Banfield in 1958 in which states that “in a society of amoral familists, no one will further the interest of the community unless it is to his private advantage to do so, and as a result, there is little loyalty to the larger community or acceptance of behavioural norms that require support of others” (Lipset and Lenz, 2000).

2 Related Literature

Empirical studies on social capital and corruption have mainly focused on establishing a relationship between the level of generalised trust within a society and the level of perceived corruption, although the causal direction of this relationship is ambiguous and subject to debate. Corruption is believed to be lower as a result of higher level of trust that others will conform to a given set of norms in society, but increasing corruption could also lead to less honesty and trust in fellow citizens by way of signalling that honesty may not pay off (Bjornskov, 2003). In a sample of 33 countries and controlling for GDP per head, La Porta et al. (1997), show that trust has a significant negative impact on corruption. This argument is supported by Uslaner (2001) who reports that social capital, measured as the extent to which people in a given society trust fellow citizens (generalised trust), is a significant cause of less corruption, but he also finds a weak evidence of reverse causality. In a subsequent paper, Uslaner (2004) confirms that the causal connection runs from trust to corruption and not the other way around, using the lagged value of generalised trust and a measure of fairness of legal system as instruments for generalised trust. Bjornskov (2003) first illustrates a causal link between social capital and corruption in a simple principal-agent-client model which suggests that the level of corruption is decreasing as a consequence of generalised trust, monitoring and income. His empirical results show a strong causal effect running from generalised trust to corruption given the inclusion of other variables and different approaches to controlling for endogeneity².

Because corrupt transactions cannot be done openly in public, only a few trustworthy insiders are allowed access to the network. This kind of trust is, however, different from the one usually cited in the literature as being beneficial to the society. It is, therefore, important to understand and distinguish different kinds of social capital in order to understand the relationship between social capital and corruption. Putnam (2000) refers to two kinds of social capital, namely bonding and bridging social capital. Whilst the former represents social capital which develops within inward looking and exclusive groups of similar people or people who share similar interests such as churches, reading groups, or ethnic organisations, the latter consists of social relations which are outward looking and encompass people across diverse social cleavages (*Ibid*). Corruption, particularly political and public corruption, is often fostered by bonding social capital since the small social distance creates high level of trust and trustworthiness as well as in-group loyalty, which help to enforce specific reciprocity within the in-group, but not towards outsiders.

² Following Uslaner (2001; 2004), he uses the 7-year lagged value of generalised trust variable as one of the instruments and as an alternative instrument, he uses the proportion of Protestant within the population. Both of which are correlated strongly with the generalised trust variable. However, compared the Protestant the lagged generalised trust does not perform as well in the 2SLS (Bjornskov, 2003).

Bonding social capital is also likely to give rise to corruption when it enables the exclusion of outsiders. Exclusiveness is essential in a corrupt network because of the imperative need for concealment of corrupt transactions. This is because corruption is not only illegal, but it also violates the norm of fairness which is likely to outrage those who do not belong to the 'in-group'. Therefore, the members of corrupt networks have to be careful in deciding with whom they choose to associate. Consequently, access to a corrupt network tends to be limited only to those who have established long-term relationships with one another. In addition, according to Francis Fukuyama (1999), "when it is difficult for people to trust those outside their narrow circles, a *lower* standard of moral behaviour applies to the outsiders. This argument is closely related to 'amoral familism' – a concept developed by Edward Banfield, which posits that "in a society of amoral familists, no one will further the interest of the group or community except if it is to his private advantage to do so" (Banfield, 1958). Within the 'amoral familism' framework, corruption is assumed in large part to be an expression of *particularism* – the feeling of obligation to help and to give resources to persons to whom one has personal obligation, to the family above all but also to friends and close peer groups (Lipset and Lenz, 2000). This behaviour is generally known as 'nepotism' or 'favouritism', which is the opposite of universalism – the commitment to treat others according to a similar standard. In a society where particularism is highly valued, loyalty and cooperation are limited only to those within the same social network (*Ibid*). Moreover, the members of such a network are less likely to consider deviations from the norms of universalism and fairness as morally wrong since such deviations are deemed as acceptable within their groups.

However, the relationship between bonding social capital and corruption has received little attention in empirical literature. Lipset and Lenz (2000) made the first attempt to empirically examine the effect of familism on corruption by creating a scale of familism from three measures obtained from the World Value Survey in 1990, and aggregate statistics from the World Bank. The authors find that the countries which score high on their familism scale tend to be among the more corrupt. They also find that this observation is particularly true for most Asian nations which are known for their strong family ties, whilst Scandinavians, which score the lowest on the familism scale, are considered to be the least corrupt according to the CPI. The relationship remains significant after controlling for per capita income and percentage of Protestants within the country.

3 Contributions of This Study

This study broadens the scope of Lipset and Lenz's analysis in two aspects. Firstly, by specifically considering two types of bonding social capital: 1) 'Inward bonding social capital' - the degree of closeness of the relationship between amongst families and friends; and 2) 'Outward bonding social capital' – the extent to which bonding social capital reduces trust and cooperation towards outsiders. When bonding social capital encourages exclusion of outsiders, the levels of trust and cooperation towards those outside one's narrow social network are reduced. This process is likely to increase in-group favouritism behaviour and corruption. Secondly, this study examines both *direct* and *indirect* effects of bonding social capital on corruption which has not previously been done.

Corrupt transactions, particularly public and grand corruption, are accomplished through a high level of bonding social capital developed and maintained through long-term relationships between close associates, which serve as an enforcement for a system-based obligations or 'normative rules' within a corrupt network. These rules are strictly followed by the members, despite the lack of law enforcement (della Porta and Vannucci, 1999). But *what are the incentives for the in-group members to obey such rules?* Apart from the obvious economic (and in some cases, political) gain from engaging in corruption, one other possible explanation is *the fear of being punished by the in-group*, which consist of long-term associates that may include family members and close friends. The punishment for defection can be extremely severe and non-reversal (when the in-group members play 'Grim' on the defector) i.e. exclusion from the group, which creates a form of *personal social cost* to the defector. Consequently, one needs to weigh this *personal social cost* (for *not* engaging in corruption) against the risk of getting caught and punished by the authority and outsiders when deciding whether to engage in corruption. However, if the two would-be collaborators in a corrupt exchange are members of the same family or a tightly-knit community, they are likely to encounter one another in the future (where corruption becomes a 'repeated game'). This adds peer pressure to the group-members and makes the *personal social cost* inevitably large. As a result, those involved in the corrupt network are likely to follow the corrupt 'normative rules', which, in turn, increases the probability that a corrupt deal will be reciprocated, making corruption more 'predictable'. Moreover, in certain societies one is engaged in a corrupt exchange in order to 'return the favour' even when he knows that it is considered as corrupt by the public at large because the norm of specific reciprocity is highly valued. But if such an exchange is viewed as acceptable within his peer, the moral costs associated with corruption are likely to be reduced since it is considered as 'good reciprocity' within his own group. This type of corruption is particularly likely to happen when: 1) 'rents' are created (economic or political rents); 2) when discretionary power is given to an individual who belongs to a

close-knit social network; and 3) when institutions are weak and inefficient since it creates an opportunity for the ‘favour’ to be created in the first place, for instance, to ‘speed up’ lethargic bureaucratic process. This can occur within both private and public sectors and at both petty and grand levels, depending on the economic and social circumstances of those involved.

To summarise, this study posits that within countries where the level of bonding social capital is high and encourages exclusion of outsiders, corrupters are more confident that their deals will be ‘honoured’ and reciprocated. This is because of the high degree of closeness of their relationships with their corrupt partners, which are likely to be through kinship or long-term friendships. Within such a close-knit network, the ‘corrupt normative rules’ are strongly enforced and abided since breaking such rules will risk being excluded from the network, which would have a significant impact on their lives. This is because not only that they will be excluded from the corrupt gains (economic cost), but they will also be excluded from their own families and peer groups (imposing ‘*personal social cost*’ for the corrupters). Consequently, people are unlikely to break such norms within the corrupt network. This, in turn, increases the confidence that corrupt transactions will be reciprocated and reduces the moral cost of corruption, ensuring the tightness of the links within the network which makes the fight against corruption much more difficult. The main hypotheses to be explored are therefore:

H1: Other things being equal, when the level of bonding social capital is high, people are more likely to engage in nepotism and corruption (direct effect).

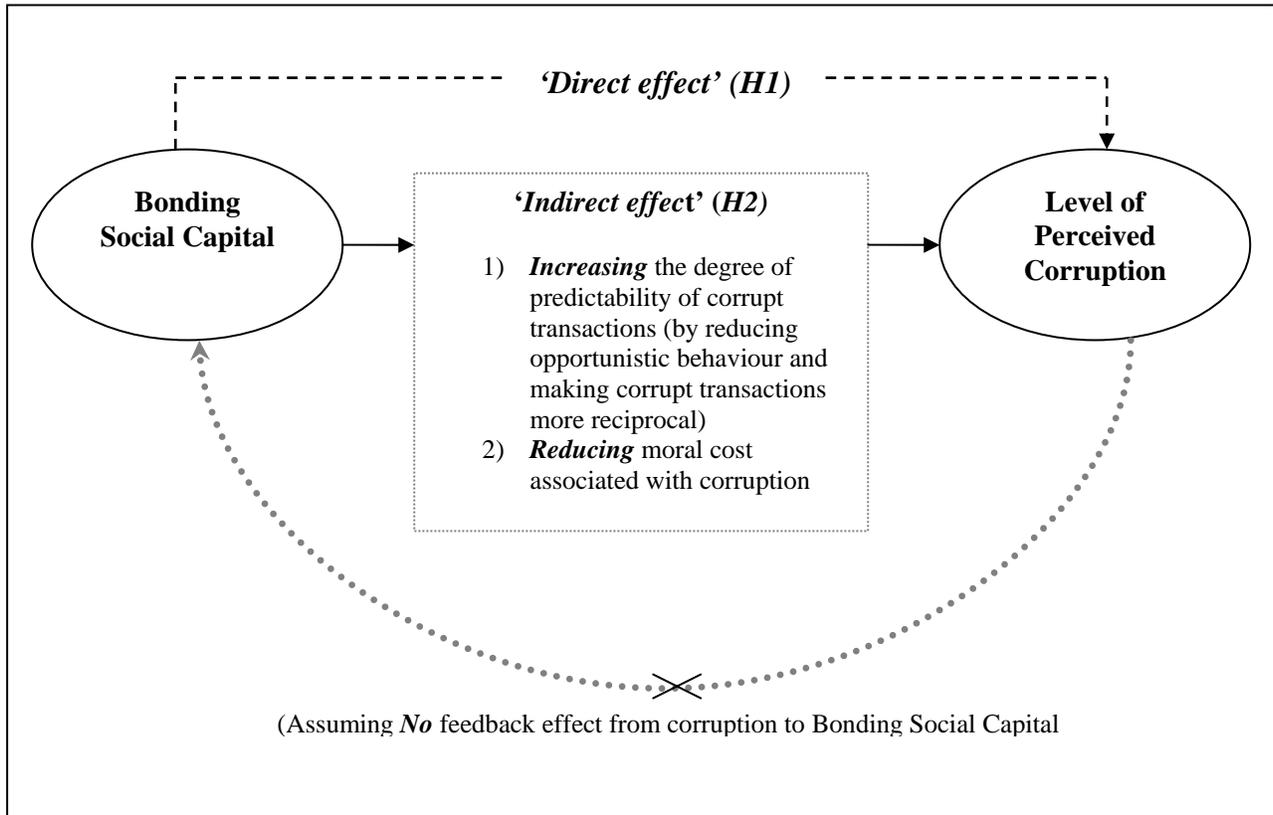
*H2: A high the level of bonding social capital makes corrupt transactions more predictable **and** reduces the moral costs associated with corruption and thus, leads to high level of corruption (indirect effect).*

4 Conceptual Framework and Empirical Strategy

The *direct* effect of bonding social capital on corruption is likely to run *from* bonding social capital *to* corruption and not the other way around as shown in *Figure 1*. The underlying theoretical consideration for this argument, which will also lend support for the empirical strategy discussed below, is that the degree of bonding social capital within a society is likely to be pre-determined by inter-generational transmission of embedded norms and values within the individual’s family and is

changing only gradually over a long period of time, which makes it unlikely to be significantly affected by the level of perceived corruption.

Figure 1:
Conceptual Framework for the relationship between Bonding social capital and corruption



In other words, the extent to which people bond with their families is pre-determined *ex ante*, regardless of the level of perceived corruption and other features of external environment. Whilst it has been argued that the high level of corruption may reduce the level of generalised trust and reciprocity towards others within a society, it is unlikely to have the similar effect on the degree to which one ‘bonds’ with one’s family and close friends. In his recent study, Tabellini (2007) argues that the internal norms and values within one’s family may also be influenced by features of the external environment, such as the quality of external enforcement (through formal institutions) or the pattern of likely future economic transactions. However, the external environment is likely to have a stronger effect on the norms of *generalised morality* which encompass generalised trust and reciprocity towards others, rather than the norms of *limited morality*, which are applicable only to a narrow circle of families and friends and are the focus of this study.

Bonding social capital can also affect corruption *indirectly*. Two potential channelling factors are considered here: firstly, bonding social capital helps reduce opportunistic behaviour of the corrupters and thus, makes corruption more predictable (increasing the confidence that the ‘goods’ will be delivered as promised) and thus, leads to more corruption; and secondly, because corruption is used as a mean to ‘return the favour’ to one’s family and close friends, the moral cost of engaging in corruption (guilt) is likely to be reduced and thus, encourages nepotism and corruption. However, in practice there may be other indirect mechanisms at work. For instance, when it is difficult for the individual to trust others outside their narrow close-knit social network, they are also less likely to have confidence in formal institutions compared to societies where generalised trust is high. As a result, within such a society people are more likely to engage in corruption by relying on their friends and families to ‘cheat the system’ or ‘speed up’ the bureaucratic processes. In order to take this effect into account, the level of bridging social capital (proxied by the level of generalised trust within the country) is controlled for. This may help (to some extent) to alleviate the omitted variables problem.

The empirical strategy is as follow. First, Multiple Regression is carried out in order to examine the *direct effect* of bonding social capital (independent variable) on the level of perceived corruption (dependent variable), controlling for a vector of other factors which may influence the level of corruption. These include the level of generalised trust within a country and the ‘Regulatory Capacity Index’ from Seldadyo and de Haan (2006) which incorporates 12 variables, namely rule of law, judicial independence and impartial court, government effectiveness, GDP per capita, political stability, regulatory quality, bureaucratic quality, law and order, labour market regulation, international trade, internal conflict, and secondary school enrolment. Therefore, the first model can be written as:

$$CORR_i = \alpha_0 + \alpha_1 BOND_i + \alpha_2 X_i + v_i \quad [1]$$

where $CORR_i$ denotes the measures of level of perceived corruption across countries i , $BOND_i$ represents bonding social capital, X_i consists of other factors which are likely to influence corruption and the level of generalised trust, and v_i is the disturbance term capturing any other random effects which are not included in the model. As a robustness check, four alternative measures of the level of corruption and the two measures of bonding social capital (inward and outward social capital) are used in all of the empirical models.

The next step is to test for the *indirect effects* of bonding social capital on corruption. First, as a suggestive test Multiple Regression is carried out to examine whether bonding social capital remains significant when the two channelling factors are included:

$$CORR_i = \beta_0 + \beta_1 BOND_i + \beta_2 PRECOR_i + \beta_3 MORALC_i + \beta_4 X_i + \varepsilon_i \quad [2]$$

where $PRECOR_i$ denotes the measure of degree of predictability of corruption, $MORALC_i$ represents the measure of moral costs associated with corruption across countries, X_i is a vector of control variables (same as equation [1]), ε_i is the disturbance term. The testing hypothesis is that if bonding social capital affects corruption *indirectly* through these two channelling factors, once $PRECOR_i$ and $MORALC_i$ enter the regression, β_1 , which is the partial coefficient of bonding social capital, is expected to be *insignificant*. This is because most of the explanatory power of bonding social capital is expected to already be captured by the two channelling factors. However, equation [2] is only a simple and suggestive test, so the next step is to use Two-Stage Least Square estimator (2SLS) to test for the *indirect effects* of these channelling mechanisms. The relationship of interest is:

$$CORR_i = \theta_0 + \theta_1 PRECOR_i + \theta_2 MORALC_i + \theta_3 X_i + u_i \quad [3]$$

Where $PRECOR_i$ and $MORALC_i$ are the predicted values from the first-stage regression using bonding social capital as the main regressor on the right-hand side³, controlling for other factors which may influence predictability of corruption and moral cost associated. An important factor which needs to be controlled for is the proportion of Protestant within the population which has been shown to have a negative impact on predictability of corruption (Lambsdorff, 2007). This is because Protestantism gives high importance to individualism which leads to a higher level of opportunistic behaviour and thus, lowers the degree of predictability of corruption. According to Lambsdorff (2007): “Societies with a large share of Protestants cultivate attitudes in which individuals are less reliable toward their kin, and less subject to the material interests of their immediate social environment. In these cases, individuals might even be willing to act opportunistically, particularly when the illegitimacy of a corrupt deal could provide an excuse for their behaviour. Thus, our assumption is that Protestant Christianity tends to decrease corruption because it increases the

³ In the first-stage regression, the use of bonding social capital on the right-hand side could be thought of as an ‘instrument’ in a conventional IV estimator.

transactional difficulties that accompany corrupt contracts.” In addition, Protestantism also encourages the sense of individual responsibility for their actions or ‘sin’ (contrary to Catholic, in which individuals can ‘confess’ their wrong-doings to the priests). This is likely to increase the moral cost associated with corruption and thus, lower the level of corruption.

Therefore, the estimating equations of the first-stage regression for the two channelling factors can be written as:

$$PRECOR_i = \delta_0 + \delta_1 BOND_i + \delta_2 PROTEST_i + \delta_3 X_i + \omega_i \quad [4]$$

$$MORALC_i = \pi_0 + \pi_1 BOND_i + \pi_2 PROTEST_i + \pi_3 X_i + \zeta_i \quad [5]$$

Where $PROTEST_i$ denotes the proportion of Protestant population across countries i , X_i is a vector of control variables (the same in both [4] and [5] and as in previous equations), ω_i and ζ_i are disturbance terms.

The two requirements for a valid instrument in the conventional IV method are: 1) ‘relevance’, which means there should be first-stage relationships between both $PRECOR_i$ and $MORALC_i$; and the instruments ($BOND_i$ and $PROTEST_i$); 2) ‘excludability’, which means that and $E(\mathbf{Z}.u_i) = 0$, where \mathbf{Z} denotes the instruments. It is important to note that the use of the 2SLS here is *not* in the strict IV sense, but instead the aim is to test for *indirect effect* of bonding social capital through the two channelling factors i.e. how much of the effect of bonding social capital on corruption can be explained by the channelling factors. But even though the use of bonding social capital in the first-stage regression here is not strictly in the conventional IV sense, it is still important, particularly for model specification purpose, for the above assumptions to be satisfied. In addition, Acemoglu (2005) also points out that these assumptions must be based on some kind of theoretical consideration in order to justify the use of this procedure. Therefore, the conceptual framework outlined above plays an important part in the formation of my empirical strategy and the interpretation of the results.

The predicted values of $PRECOR_i$ and $MORALC_i$ from [4] and [5] - \hat{PRECOR} and \hat{MORALC} - are substituted into the second-stage structural model for each channelling factor which yield:

Second-stage (predictability of corruption):

$$CORR_i = \theta_0 + \theta_1 \hat{PRECOR}_i + \theta_2 X_i + \xi_i \quad [6]$$

Second-stage (moral cost of corruption):

$$CORR_i = \sigma_0 + \sigma_1 \hat{MORALC}_i + \sigma_2 X_i + \vartheta_i \quad [7]$$

In equations [6] and [7] the predicted values for the predictability of corruption (\hat{PRECOR}) and the moral costs (\hat{MORALC}) have taken into account the degree of bonding social capital for countries i from the first-stage regression - implying that bonding social capital indirectly affects the level of perceived corruption through these two channelling factors. The key assumption is that the main regressors (or the ‘instruments’) in the first-stage regression (bonding social capital and Protestant) are not correlated with the error term, u_i , in the second-stage equations [6] and [7]⁴. The theoretical argument for this assumption, as outlined above, is that bonding social capital is likely to be embedded, maintained, and transmitted within one’s family and only changes slowly over time. Parents rationally choose what norms to transmit to their offspring (Tabellini, 2007), conditioning on their own specific socio-economic environments, which, unlike the norms of generalised trust and reciprocity (or bridging social capital), may not necessarily be significantly influenced by other random external factors included in u_i . This ‘excludability’ assumption can be formally tested using the Hausman test (or Hansen-J test) where the testing hypothesis is that the ‘instruments’ (bonding social capital and Protestant) are correctly excluded from the structural model and thus, the model is correctly specified. The Hansen-J p-values above 0.05 suggest that the data cannot reject the validity of one of the instruments at the 5% critical level, although this test does not specify which instrument is uncorrelated with the error term in the second-stage regression. Following Acemoglu (2005), the F-test for joint significance of the excluded instruments⁵ (Bound, et. al., 1995) in the first-stage regression is carried out in order to test for the ‘relevance’ of the ‘instruments’ (the relationship between the instruments and the endogenous regressors).

⁴ In a conventional IV strategy, the instruments should be orthogonal to the error term of the second-stage equation (Acemoglu, 2005). This condition also applies here.

⁵ An *excluded instrument* refers to that used in the first-stage regression but not included in the second-stage. *Included instruments* refer to all other exogenous variables used to identify the endogenous variables (control variables).

5 The Data

5.1 The Level of (Perceived) Corruption

Corruption is usually defined in the literature as ‘*the abuse or misuse of public power for private gain*’ (Jain, 2001). However, in practice the public may form different expectations vis-à-vis public roles of officials cross different countries. What is considered as appropriate and acceptable in one society may be considered as corrupt in others and thus, how officials should serve the public can be largely influenced by local taste (Lambsdorff, 2007). A crucial indication of a corrupt deal is the fact that it cannot be done in public since it goes against the generally acceptable norms, particularly the norm of fairness. Therefore, corruption can arguably be universally characterised by its secrecy and concealment, regardless of whether it involves a large sum of money at high levels of public offices or day-to-day small bribes paid at lower levels of the bureaucratic chain, and whether it occurs in the public or private sectors. This study will utilise this broader definition of corruption and examine different types of corruption (i.e. both grand and petty corruption and within the public and private sectors), as long as they are carried out in secret and considered as illegitimate or unacceptable by the public at large.

The most popular and widely used measure of the perceived level of corruption is the composite index produced by Transparency International, called the ‘Corruption Perception Index (CPI)’. The CPI provides assessments of perceived levels of corruption for a cross-section of countries, ranging from 0= most corrupt to 10=least corrupt.⁶ The CPI focuses on corruption within the public sector and defines corruption as ‘the abuse of public office for private gain’. It ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians and the extent of corruption, as defined by the CPI, reflects the frequency of corrupt payments and the resulting obstacles imposed on businesses (Lambsdorff, 2004). It is a composite index, drawing on corruption-related data in expert surveys carried out by a variety of reputable institutions. It reflects the views of businesspeople and analysts from around the world, including experts who are resident in the countries evaluated (Transparency International, 2004).

Treisman (2000) asserts that the CPI are particularly useful because firstly, they are available for recent years unlike most other corruption indexes, which were gathered in the 1970s or 1980s; and

⁶It is noteworthy that a country which scores the lowest on the CPI is not necessary the most corrupt country in the world since the CPI does *not* include all countries in the world (Transparency International, 2004).

secondly, they are based on a broad range of different sources, and whilst these sources use different types of respondents, the correlation amongst them are high, suggesting that the patterns of public perceptions are moving along the same direction. However, Treisman's point regarding comparison of the CPI data across the years is misleading. Since both the methods and data sources of the CPI change from year-to-year, as stated in all of the CPI methodology papers, it is not possible to compare this index across time (Transparency International, 2004).

This paper uses the 1998 CPI index, which covers 82 countries (*CORR1*) since it corresponds with the timescale of the measure of predictability of corruption which is only available for 1997 (this measure will be discussed in the next section). As mentioned above that Transparency International changes the methodology used in constructing the CPI from year-to-year, which undermines the comparison of the CPI over time. In order to test for this effect, the average CPI between 1997 and 1999 as used in Tabellini (2001) is also examined. Tabellini constructs a new index by subtracting the CPI scores by 10 so that the higher scores reflect higher levels of corruption. The weighted version of this transformed CPI index (weighted by the inversed standard deviations which are different rankings given to a specific country by the different polls used to construct the CPI, in order to adjust for measurement errors), forms the variable '*CORR2*'. If the changes in the methodology used to construct the CPI over time is to have a significant effect, one would expect that the empirical results obtained using this variable as the dependent variable would be significantly different from those obtained from the 1998 CPI index.

The second measure which is also widely cited in the literature is the 'Control of Corruption' index, which is one of the six Governance Indicators published every two years since 1996 by the World Bank. Similar to the CPI, it is a poll-of polls index, but has a larger coverage of almost 200 countries.⁷ Its aim is to measure the exercise of public power for private gain, including both petty and grand corruption as well as state capture, drawing on about 40 data sources produced by more than 30 different organisations, which cover a wider scope of definition corruption than the CPI. The definitions of these sources range from the frequency of additional payments to get things done, to the effects of corruption on the business environment, to measuring grand corruption in the political arena or in the tendency of elite forms to engage in state capture (Kaufmann, et al., 2006). The more control of corruption a country has, the more likely it is to be less corrupt (high score = less corruption, low score = more corruption). The point estimate of corruption in 1998, which is the mean of the conditional distribution given the observed data, ranging between -2.5 (most corrupt) and +2.5 (least corrupt), is used for the variable '*CORR3*'.

⁷ Other governance indicators include 'Voice and Accountability', 'Political Stability', 'Government Effectiveness', 'Regulatory Quality', and 'Rule of Law'.

The third measure of the level of corruption comes from the business survey conducted by the World Bank and University of Basel for *the World Development Report* in 1997 (the details of the survey methods are discussed in the next section). This survey asked business people two questions which are related to corruption:

Q14: “It is common for firms in my line of business to have to pay some irregular ‘additional payment’ to get things done” (1=always, 2=mostly, 3=frequently, 4=sometimes, 5=seldom, 6=never)

Answer ‘1’ or ‘always’ to question 14 suggest high level of corruption *within* that country. The reason for choosing this measure is because the above question provides crucial information on the private sector’s propensity to pay bribes to public officials from the perspective of the private-sector or the ‘briber’. This adds an extra dimension to the measure of corruption, which is not covered neither by the CPI nor the Control of Corruption Index and has rarely been explored in the literature.

The final measure of corruption comes from the fourth wave (1999-2004) of World Value Survey which is also the source for the social capital data. The question regarding the level of political corruption within a country as perceived by the citizen of that country is used:

“How widespread do you think bride taking and corruption is in this country?”(1=Almost no public officials engaged in it, 2=A few are, 3=Most are, 4=Almost all public officials are engaged in it)

The percentages of people *within a country* answering 3 and 4 to this question are used for the last measure of corruption. The summary statistics of all measures of the level of perceived corruption are shown in *Table 1* and the correlation matrix of all five measures is shown in *Table 2*. The high and significant correlations ($r > 0.6$) between these measures suggest a consistency in measurement of the level of corruption across different measures.

TABLE 1
SUMMARY STATISTICS:
MEASURES OF CORRUPTION

Variable	Data Source/Description	Obs	Mean	Std. Dev.	Min	Max
CORR1	Transparency International/ 1998 CPI Index (high score = less corrupt)	82	4.93	2.43	1.4	10
CORR2	Tabellini (2000) / Inversed average and weighted CPI 1997-99 (high score = more corrupt)	83	5.3	3.25	0.01	14.96
CORR3	World Bank / 1998 Control of Corruption Index (high score = less corrupt)	190	-0.06	1	-1.5	2.52
CORR4	1997 World Development Report / Sum of country average scores for the following questions: - Q12n: "how problematic corruption is for doing business" - Q14: "It is common for firms in my line of business to have to pay some irregular 'additional payment' to get things done" (high score = more corrupt)	72	6.7	1.7	4.48	11.4
CORR5	World Value Survey (1999-2004)/ Percentage of people within a country answered 'Most are' and 'Almost all public officials are engaged in it' to question: " How widespread do you think bribe taking and corruption is in this country?" (high score = more corrupt)	49	66.39	20.29	13.98	92.72

TABLE 2
CORRELATION MATRIX:
MEASURES OF LEVEL OF (PERCEIVED) CORRUPTION

	CORR1	CORR2	CORR3	CORR4	CORR5
CORR1	1.00				
CORR2	-0.69**	1.00			
CORR3	0.98**	-0.69**	1.00		
CORR4	0.86**	-0.70**	0.82**	1.00	
CORR5	-0.89**	0.75**	-0.85**	-0.71**	1.00

Note: ** represents 1% significance level.

Measures of Corruption:

CORR1 = 1998 CPI Index (source: Transparency International);

CORR2 = Inversed average and weighted CPI 1997-99 (source: Tabellini, 2000);

CORR3 = 1998 Control of Corruption Index (source: World Bank);

CORR4 = Sum of country average scores for the following questions: Q12n: "how problematic corruption is for doing business"; and Q14: "It is common for firms in my line of business to have to pay some irregular 'additional payment' to get things done" (source: 1997 World Development Report);

CORR5 = Percentage of people within a country answered ‘Most are’ and ‘Almost all public officials are engaged in it’ to question: “How widespread do you think bride taking and corruption is in this country?” (Source: the World Value Survey waves 1994-99 and 1999-2004)

5.2 Predictability of Corrupt Transactions

The first channelling factor which may help to explain the *indirect* association between bonding social capital and corruption is the degree of ‘predictability’ of (confidence in) corrupt transactions. The underlying theoretical argument is that high level of bonding social capital is likely to increase the likelihood that the ‘good’ will be delivered as promised after a bribe has been paid, and thus, leads to higher level of corruption. The measure for predictability of corruption comes from the ‘Private Sector Survey’ conducted by the World Bank and University of Basel for *the World Development Report* in 1997. The aim of the survey was to produce cross-country measurements of the reliability and predictability of institutions based on local entrepreneurs’ views of the predictability of changes in law and policies, of the reliability of law enforcement, of the impact of discretionary and corrupt bureaucracies and of the danger of policy reversals due to changes in governments (Brunetti and Weder, 1998). The process of implementing the survey began in August 1996 and ended in June 1997 and at the survey's conclusion 74 countries had participated.

The questions which are used as measures for predictability of corruption are those relating to ‘*Law Enforcement and Bureaucratic Red Tape*’, which focus on whether corruption is a predictable transaction cost or a source of uncertainty. A potential problem with questions regarding bribery is, of course, the firms’ reluctance to openly admit that it pays bribes. In an attempt to deal with this problem, the survey did not directly ask about *bribes*, but the respondents were instead asked to assess three characteristics of their home country with respect to ‘irregular additional payments’ which they were asked to pay when doing businesses within a country, a term which is sufficiently close to ‘bribe and corruption’ (Lambsdorff, 2007). The questions addressed the level of predictability relating to the possibility of additional payments, the size and frequency of these payments, and the confidence that the deals would be reciprocated. Answer ‘1’ or ‘*always*’ to the following questions implies high level of predictability of corruption within that country:

(Following from question 14)

Q15: “Firms in my line of business usually know in advance about how much this ‘additional payment’ is” (1=always, 2=mostly, 3=frequently, 4=sometimes, 5=seldom, 6=never)

Q17: “If a firm pays the required ‘additional payment’ the service is usually also delivered as agreed” (1=always, 2=mostly, 3=frequently, 4=sometimes, 5=seldom, 6=never)

Unfortunately, the data for this variable is rather limited both in terms of the timescale (it is only available in 1997) and the unit (only available at a country-average level and *not* the individual level). Because this data is not available at the individual level, the country average scores which are *lower* than the sample mean are interpreted as indicating a relatively *high* level of ‘predictability of corruption’ (considering ‘1’ being highly predictable and ‘6’ being highly unpredictable). For example, the sample mean is 6.18. Nigeria’s score is 4.9 whilst that of India is 8.26, which suggest that compared to India, corruption in Nigeria is more predictable. In other words, after the bribe is paid, it is more likely that the ‘goods’ will be delivered as promised in Nigeria rather than in India.

5.3 Social Capital

One of the commonly used sources for measures of social capital and cultural values is the World Value Survey (WVS), which has been carried out by the European Values Study Group and the World Value Survey Association, both of which consist of an international network of social scientists led by Ronald Inglehart⁸. The survey has been carried out in five waves: 1981-84, 1989-93, 1994-99, 1999-2004, and 2005-06, providing cross-country data for around 80 countries which account for almost 85 percent of the world’s population. It is designed to measure a variety of cultural traits ranging from perception of life to confidence in institutions and government and are based on national representative samples of all residents (not only citizens) between the ages of 18 and 85 inclusive (the minimum sample size is N=1,000).

As mentioned above, most studies of social capital and corruption have focused on generalised or bridging social capital i.e. how bridging social capital may help to *reduce* corruption. Therefore, one of the most popular questions in the World Value Survey which has been used often in the social capital and corruption literature is “*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*” A number of studies have shown that the high level of *generalised* trust appears to have a negative impact on the level of perceived corruption (Bjornkov, 2004; Knack and Keefer, 1997; La Porta, Lopez-de-Silanes, Shleifer and Vishny, 1997; Uslaner, 2001; 2004). Contrary to existing studies on social capital and corruption,

⁸ <http://www.worldvaluessurvey.org/>.

the main objective of this study is to examine bonding social capital, which is generally characterised by the norms of particularised trust and reciprocity within a close-knit social network of families and friends. However, similar to corruption, measuring social capital is non-trivial and the question relating to generalised trust alone would not adequately represent bonding social capital. There are many questions within the WVS which have not been examined and can potentially be considered as measures for bonding social capital (see *Table 3*).

Because the unit of analysis of this study is at *country* level, the percentages of the population *within* each country who answer the WVS questions in such a way which represents the important elements of bonding social capital – i.e. high degree of particularised trust and specific reciprocity amongst families and friends – are used. For examples, for the question regarding ‘respect and love for one’s parent’, the percentage of respondents within each country who answer ‘*always*’ (score = 1) are used and the same also applies to other variables. Exploratory Factor Analysis (EFA) by means of Principal Component Analysis (PCA) is carried out to explore these questions⁹. Contrary to existing studies on social capital and corruption which usually only consider the trust-related question, by exploring a larger number of questions which represent other aspects of social capital, this study will be able to provide better coverage of the concept.

⁹ Exploratory Factor Analysis (EFA) seeks to uncover the underlying structure of a relatively large set of variables. The researcher's *à priori* assumption is that any indicator may be associated with any factor. Principal Component Analysis (PCA) is the most common form of factor analysis. It analyses total (common and unique) variance and seeks a linear combination of variables such as the maximum variance is extracted from the variables. EFA assumes no prior theory and one uses factor loadings to intuit the factor structure of the data (Bryant and Yarnold, 1995; Garson, 1998).

TABLE 3
SUMMARY STATISTICS:
MEASURES OF SOCIAL CAPITAL

Variable	Data Source	Obs	Mean	Std. Dev.	Min	Max
BONDING SOCIAL CAPITAL						
FAM_3	Percentage of people answered 'very important' to question: Family important in life	52	87.87	7.11	68.06	98
FRN_3	Percentage of people answered 'very important' to question: Friends important in life	52	41.9	15.57	16.19	73.59
STO_35	Percentage of people answered 'very important' to question: Service to others important in life	37	3.08	4.81	0.14	22.67
LRP_3	Percentage of people answered 'always' to question 'Regardless of what the qualities and faults of one's parents are, one must always love and respect them'	52	82.1	14.29	9.26	95.74
BSMG_3	Percentage of people answered 'owner should run their business' to question: 'How business and industry should be managed'	50	34.9	12.3	10.31	64.05
PARES_3	Percentage of people answered 'Parents' duty is to do their best for their children even at the expense of their own well-being'	52	71.33	12.93	43.53	91.89
CHOB_3	Percentage of people answered 'obedience', to question: Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important?	53	34.42	15.35	6.26	70.69
LFE_3	Percentage of people answered 'agree strongly + agree' as % of total respondent to question: 'For each of the following statements I read out, can you tell me how much you agree with each. Do you agree strongly, agree, disagree, or disagree strongly with 'Make effort to live up to what my friends expect'	50	52.76	16.82	19.15	88.92
CHL_OB3	Percentage of people answered 'obedience', to question: Here is a shorter list of things that children can be encouraged to learn. If you had to choose, which one of these do you consider the most important thing for a child to learn at home?	50	26.81	12.39	4.9	53.06
MPP_3	Percentage of people answered 'agree strongly + agree' as % of total respondent to question: 'For each of the following statements I read out, can you tell me how much you agree with each. Do you agree strongly, agree, disagree, or disagree strongly with 'One of main goals in life has been to make my parents proud'?	51	74.25	15.39	35.21	96.32

Variable	Data Source	Obs	Mean	Std. Dev.	Min	Max
BONDING SOCIAL CAPITAL (CONT.)						
JUST_DV3	Percentage of people answered 'Never' to question: 'Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between: Justifiable: Divorce'	51	21.91	15.66	2.44	74.45
LIVWP_3	Percentage of people answered 'Yes' to question: 'Do you live with your parents'	50	26.1	11.17	5.98	47.09
CONTRL_3	Percentage of people answered 'none at all' to question: How much freedom of choice and control	49	4.88	4.89	0.36	31.07
OWN_35	Percentages of respondents answered 'agree' + 'strongly agree' to question: Stick to own affairs	31	51.37	13.48	26.7	71.03
IMMFAM_35	Percentages of respondents answered 'very much' + 'much' to question: Concerned with immediate family	32	84.71	18.71	28.9	98.52
HELPFAM_35	Percentages of respondents answered 'absolutely yes' + 'yes' to question: Prepared to help immediate family	31	93.49	6.43	65.68	99.3
WLTH_3	Percentages of respondents answered 'People can only get rich at the expense of others' to question regarding: Wealth Accumulation	50	7.92	4.68	0.00	25.19
TAKAV_35	Percentage of people answered 'would take advantage' to question: 'Do you think most people try to take advantage of you'	39	56.18	16.94	12.58	83.22
CHARMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of charitable/humanitarian organization	50	84.6	16.25	0.45	99.09
OTHMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of any other organisation	50	86.04	15.49	0.45	100
REGMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of church or religious organization	49	62.03	25.65	4.15	98.51

Variable	Data Source	Obs	Mean	Std. Dev.	Min	Max
BONDING SOCIAL CAPITAL (CONT.)						
SPTMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of sport or recreation	50	74.4	18.12	0.4	97.31
ARTMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of art, music, educational	50	80.97	16.04	0.35	96.55
LABMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of labour unions	51	78.05	16.81	0.4	97.77
POLMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of political party	51	84.73	16.67	0.4	98.87
ENVMEM	Percentages of respondents answered 'not a member' to question: Active/Inactive membership of environmental organization	49	88.23	15.02	0.45	99.45
LONG_35	Percentages of respondents answered 'agree' + 'strongly agree' to question: Long-term relationship is necessary to be happy	32	63.49	18.08	20.48	90.47

Data source: World Value Survey waves 3 (1994-99) and 4 (1999-2004).

For the measures of the moral costs associated with corruption, which is the second *indirect* channelling factor to be considered, the questions regarding ‘justification’ of various law-breaking activities from the WVS are used. The percentages of people who answer 10 = ‘always justifiable’ are used for each question. The summary statistics the measures for moral costs are shown in *Table 4*.

“Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between.”, answers are measured on a 10-point scale (1 = never justifiable, 2 = 2, 3 = 3, 4 = 4, 5 = 5, 6 = 6, 7 = 7, 8 =8, 9= 9, 10 = always justifiable).

- a. *Claiming government benefits to which you are not entitled (just_cl35)*
- b. *Avoiding fare on public transport (just_tr35)*
- c. *Cheating on taxes (just_tx35)*
- d. *Someone accepting a bribe (just_br35)*

TABLE 4
SUMMARY STATISTICS:
MEASURES OF (LACK OF) 'MORAL COSTS'

Variable	Data Source	Obs	Mean	Std. Dev.	Min	Max
JUST_CL35	Percentage of people answered 'Always' to Claiming Government benefit to which you are not entitled, WVS wave 1999-2004	78	2.99	2.47	0	12.33
JUST_TR35	Percentage of people answered 'Always' to Avoiding a fare on public transport, WVS wave 1999-2004	73	3.48	2.67	0	11.15
JUST_TX35	Percentage of people answered 'Always' to Cheating on taxes if you have a chance, WVS wave 1999-2004	78	2.9	2.45	0	11.22
JUST_BR35	Percentage of people answered 'Always' to Someone accepting a bribe in the course of their duties, WVS wave 1999-2004	81	1.31	1.94	0	15.65
SUMORALC	Sum of the above scores	80	10.24	7.64	0.47	43.79

However, there are some caveats which need to be taken into account when using this type of survey data which aims to measure attitudes and values. Firstly, they may have some hidden bias due to the complexity of the survey, ranging from the fact that responses may vary according to the way the question is phrased (framing effect) and who is asking it, to the absence of consistent data for many countries and many time periods. Secondly, when people answer that ‘most people would try to take advantage’, they could be merely reporting their experiences, for example, victims of crime and violence – wherever they live – express reduced level of trust towards others. Hence, survey data, particularly cross-section data, are subject to many problems including complex methodology; departures from simple random sampling assumptions, and problems of sample selection; measurement errors; and incomplete and/or missing data.

5.4 Control Variables

Empirical studies on corruption have examined various factors which are likely to give rise to corruption. These include economic factors such as the level of development (commonly proxied by per capita income or GDP), the degree of openness to trade, income distribution; political factors, such as length of democratic regime; judicial and bureaucratic factors, such as legal origin (common vs. civil laws); and religious and geo-cultural factors, such as religion, colonial heritage, and ethnolinguistic homogeneity. Some of these factors may also influence the degree of bonding social capital

within a society and thus, need to be controlled for. However, it will not be possible to control for *all* factors since the problem of multicollinearity may become too severe. Seldadyo and de Haan (2006) use Extreme Bound Analysis to examine a large number of the possible determinants of corruption (70 variables). They find that the first factor which they call ‘Regulatory Capacity’ holds the most explanatory power for the different level of perceived corruption across countries (they used the World Bank’s Control of Corruption Index as the dependent variable). This factor consists of a broad range of variables, including rule of law, judicial independence and impartial court, government effectiveness, GDP per capita, political stability, regulatory quality, bureaucratic quality, law and order, labour market regulation, international trade, internal conflict, and secondary school enrolment. Therefore, ‘regulatory capacity’ index will be used as the main control variable for other determinants of corruption since it has been robustly tested as having significant effect on the level of perceived corruption. In addition, the level of generalised trust within a country using the usual generalised trust question (as used in the previous studies) is also controlled for.

5.5 Data Sampling and Missing Values

The sampling technique is unfortunately restricted to the fact that cross-country data are limited in the country coverage and vary widely across different data sources. This results in an incomplete data problem which poses a problem for the Factor Analysis which is based on an initial reduction of the data to the sample mean vector and sample covariance matrix of the variables and thus, cannot be estimated from dataset with a large proportion of missing values (Little and Rubin, 1987). In addition, the lack of data increases the degree of uncertainty, and influences the ability of draw accurate conclusion (Seldadyo and de Haan, 2006). Most empirical analyses in the literature employ ‘listwise deletion’, also known as complete-case analysis, in order to deal with missing data which is also the default method in many statistical packages (Little and Rubin, 1987). Therefore, this method will be applied to the *overall* regression analyses.

However, because the data for social capital contain a large proportion of missing values, data imputation is required before the Factor Analysis can be carried out. The *Expectation-Maximisation (EM) Algorithm* as suggested by Dempster, Laird, and Rubin (1997) and Little and Rubin (1987) is used to fill in missing data. The EM Algorithm is based on iterating the process of regression imputation and maximum likelihood (Little and Rubin, 1987). The Algorithm has recently been implemented in the study of determinants of corruption by Seldadyo and de Haan (2006) and appears to work well with this type of data. The EM process consists of two steps: the first step or the ‘E

(expectation) step' computes expected values (conditional on the observed data) and the current estimates of the parameters i.e. it estimates $\hat{\alpha}$, $\hat{\beta}$ to impute X from Y_{obs} .

$$X_{imp} = \hat{\alpha} + \hat{\beta} Y_{obs} \quad [1]$$

Where X_{imp} is the imputed data and Y_{obs} represent the observed data. It is important to note that in SPSS, the imputations include no residual variation since imputed residuals would add noise to the algorithm, and thus introduces random variation that is not inherent in the data (SPSS Inc. 2002). Missing values are thus replaced by the conditional mean of X_{imp} , given the set of values, Y_{obs} , observed for that observation. Using the estimated 'complete data', in the second or 'M' step EM re-estimates the means, variances, and covariance using a formula that compensates for the lack of residual variation in the imputed values of X (SPSS Inc. 2002). The newly estimated moments $\hat{\mu}_1$ and $\hat{\Sigma}_1$ imply new estimates $\hat{\alpha}_1$, and $\hat{\beta}_1$ of the regression parameters. These new regression estimates are used to generate new imputations of X , and the process iterates until convergence (in the case of the social capital data used in this study, the convergence was achieved after 100,000 iterations, with tolerance level = 0.001). The moments estimated in the final iteration are the EM estimates: $\hat{\mu}_{EM}$ and $\hat{\Sigma}_{EM}$ (von Hippel, 2004). As shown in Dempster et al. (1997) that EM estimates converges to maximum likelihood (ML) estimates, and because ML estimates are consistent, the EM estimates converge in probability to the population parameters: μ and Σ .

The EM Algorithm assumes that the data are missing at random (MAR)¹⁰ and in order to check that the MAR assumption can be applied to the measures of bonding social capital, a test analysis called 'separate variance t-test', in which rows are all variables which have 1% missing or more, and columns are all variables, is carried out. The p-values (2-tail) are more than 0.05 which means that missing cases in the row variable are not significantly correlated with the column variable and thus, can be considered as missing at random (MAR). Moreover, the descriptive statistics of the imputed dataset contains similar distribution (similar means and skewness) to the original dataset. In addition, an internal sensitivity test is also carried out by creating a separate dataset for all measures of bonding social capital and randomly deleting some of the 'observed' data. Then the EM method is

¹⁰ If Y_{obs} denotes the observed values of Y and Y_{miss} denotes the missing values, MAR assumes that missingness is related to only the Y_{obs} which are observed, but not on the Y_{miss} (see Little and Rubin, 1987)

performed on the new dataset. It turns out that both are closely matched which gives a reassurance that any possible bias resulting of the imputation method is limited.

Using the complete datasets for the measures of bonding social capital (209 observations), Principal Component Analysis is carried out. Following Seldadyo and de Haan (2006), the varimax rotation method, which is an orthogonal rotation of the factor axes to maximize the variance of the squared loadings of a factor on all the variables in a factor matrix, is chosen. This procedure will result in each factor having either large or small loadings of any particular variable, which helps to identify each variable with a single factor and thus, makes it easier to interpret the factors. The Cronbach's Alpha test for assessing the reliability of the factors is 0.75 which is higher than the usual 0.7 acceptable reliability. This provides support that the factors extracted from the Principal Component Analysis are reliable and consistent.

Table 5 shows the rotated component matrix for the factor analysis of the EM imputed dataset. There are a total of 7 components extracted, of which the first and second components have the most loadings (only the strong factor scores i.e. > 0.5 are shown in the table). The first component consists of 9 variables which can be considered as representing low level of cooperation towards outsiders ('outward bonding social capital', *OUT_BOND*), including percentages of people answering 'no' to questions which ask whether they are a member of different voluntary organisations and those answering 'very important' to the question regarding marriage or long-term relationship. This measure represents the inward-looking attitude fostered by bonding social capital in which people give high importance to family and the long-term relationship within their narrow social circle, but are less interested in associating and cooperating with those outside their group. The second component has 6 variables which reflect degree of personal ties amongst families and friends ('inward bonding social capital', *IN_BOND*), including the percentages of people within a country who agree strongly that 'one of the main goals in life has been to make their parents proud', 'make an effort to live up with what their friends expect', 'regardless of what the qualities and faults of one's parents are, one must always love and respect them', 'divorce is never justifiable', and percentages of people who still live with their parents. These first and second components are used as the measures of 'outward' and 'inward' bonding social capital respectively since they contain the largest factor loadings¹¹.

¹¹ The rotated component matrix for the mean-replacing imputation method also yields similar result to the EM imputed dataset. However, it is noteworthy that the imputed dataset using regression method does not work well in Principal Component Analysis (producing a large number of factors with multiple loadings).

TABLE 5

**PRINCIPAL COMPONENT ANALYSIS: MEASURES OF SOCIAL CAPITAL
(Using EM-imputed Data)**

Rotated Component Matrix (a)

	Component						
	1	2	3	4	5	6	7
ARTMEM	0.966375						
ENVMEM	0.962134						
CHARMEM	0.958498						
OTHEMEM	0.932368						
SPTMEM	0.905528						
POLMEM	0.884256						
REGMEM	0.735751						
LABMEM	0.703194						
LONG_35	0.53636						
LIVWP_3		0.850744					
MPP_3		0.766204	0.512443				
LFE_3		0.719314					
JUST_DV3		0.632453					
WLTH_3		0.562073				-0.505048	
LRP_3		0.527593					
CONTRL_3							
CHL_OB3			0.933503				
CHOB_3			0.870898				
PARES_3			0.765017				
TAKAV_35				0.854912			
STO_35				0.748562			
HELPFAM_35				-0.642225			
FAM_3				0.532156			
OWN_35					0.902702		
FRN_3					-0.746325		
IMMFAM_35						0.893294	
BSMG_3							0.802684

Notes:

- 1) Extraction Method: Principal Component Analysis (only the factor scores > 0.5 and < -0.5 are shown in the table).
- 2) Rotation Method: Varimax with Kaiser Normalization., (a) Rotation converged in 12 iterations.
- 3) Highlighted in blue are the first two principal components used in the empirical analyses.

6 The Results

6.1 Bonding social capital and corruption (*'Direct Effect'*)

The results from *the first model*¹², which examines the *direct effect* of bonding social capital on the level of perceived corruption, are shown in *Tables 6A and 6B*. For both tables, the odd columns show the results which control for the 'regulatory capacity index' (Seldadyo and de Haan, 2006) but do not control for the level of bridging social capital or generalised trust, whilst the even columns show the results after controlling for both. The F-statistics for the Ramsey RESET test for omitted variable and the D'Agostino-Pearson omnibus test for normality of the residuals are also reported in the last two rows¹³.

Table 6A shows the results for outward bonding social capital (*OUT_BOND*) which is positively and significantly correlated with three out of the five measures of corruption after controlling for other factors which may influence corruption (proxied by the *REGCAP* index) and the level of generalised trust within the country. It is important to note that the coefficients for outward bonding social capital in specifications (1) – (6) are negative because the corruption indices used in these columns are measured in reversed scale, *low* scores denote *high* level of corruption, whilst for specifications (7) – (10) *low* scores represent *low* corruption. The two measures of corruption which are not significantly correlated with outward bonding social capital are those from the World Bank (*CORR3*) and the WVS (*CORR5*). However, it is interesting to note that most of the specifications do not pass the Ramsey test for omitted variables (p-values <0.05 and thus, reject the null that there is *no* omitted variables)¹⁴, implying that there are other factors which influence corruption but are not accounted for in other models (which may encompass the channelling factors which are not included in these specifications).

¹² All empirical analyses in this study are carried out in STATA and use robust standard error. This is because not all specifications pass the White's test for Homoskedasticity, and thus, robust standard error is used for all models.

¹³ H_0 for the Ramsey RESET test is 'the model has no omitted variables' and H_0 for the D'Agostino-Pearson normality test is 'the residual is normally distributed'. In addition, I also control for the degree of materialism within each country, but this variable is not significant in all specifications, so it is not reported.

¹⁴ When the model is run using the measures of bonding social capital from the mean-imputed dataset (rather than the EM-imputed dataset as used in the main analysis), I also obtain similar results.

TABLE 6A
(BASELINE MODEL)
CORRUPTION AND OUTWARD BONDING SOCIAL CAPITAL (OUT_BOND)

	DEPENDENT VARIABLES									
	high score = less corruption		high score = less corruption		high score = less corruption		high score = more corruption		high score = more corruption	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
REGRESSORS	1998 CPI	1998 CPI	WB's Control of corruption	WB's Control of corruption	1997 WDR Survey	1997 WDR Survey	Inversed CPI 1997-99	Inversed CPI 1997-99	WVS 1994-99	WVS 1994-99
Outward Bonding Social Capital	-0.37 (3.45)**	-0.34 (2.50)*	-0.07 (-1.40)	-0.04 (-1.52)	-0.21 (2.69)**	-0.21 (2.59)*	0.68 (2.94)**	0.91 (3.00)**	0.47 (-0.47)	0.19 (-0.19)
Regulatory Capacity Index	4.14 (18.94)**	3.93 (12.57)**	1.76 (22.26)**	2.11 (22.41)**	1.33 (9.82)**	1.52 (6.54)**	-3.90 (7.46)**	-3.44 (5.17)**	-32.73 (7.81)**	-28.34 (6.57)**
Generalised Trust		0.02 (-1.53)		0.01 (-1.43)		-0.03 (2.54)*		0.00 (-0.05)		-0.30 (-1.97)
Constant	3.99 (35.75)**	3.57 (12.57)**	-0.01 (-0.17)	-0.25 (2.66)*	3.84 (53.23)**	4.44 (18.14)**	6.03 (18.63)**	5.66 (8.62)**	71.47 (36.55)**	78.18 (20.93)**
Observations	82	39	180	53	70	30	83	39	49	49
R-squared	0.87	0.89	0.80	0.90	0.61	0.66	0.50	0.65	0.59	0.62
Ramsey RESET Test for omitted variables	4.80 [0.00]	5.22 [0.00]	29.82 [0.00]	10.80 [0.00]	2.51 [0.07]	3.10 [0.05]	0.15 [0.93]	0.36 [0.78]	4.26 [0.01]	3.93 [0.01]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	8.85 [0.01]	5.38 [0.06]	8.61 [0.01]	6.20 [0.04]	10.30 [0.00]	1.95 [0.38]	11.08 [0.00]	7.20 [0.02]	8.92 [0.01]	5.56 [0.06]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Ramsey RESET Test for omitted variables (H_0 : The model has *no* omitted variables); and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

The results for inward bonding social capital (*IN_BOND*) are shown in *Table 6B*. This measure, which represents the degree of closeness of one's family and friends, appear to be significantly and positively correlated with the 1998 CPI index and the World Bank's Control of Corruption index. However, when the level of generalised trust is controlled for, only the result from the specification in which 1998 CPI is used as the dependent variable remains significant. The empirical results from the first model provide two interesting suggestions: Firstly, it is the outward bonding social capital which has a stronger effect on corruption; and secondly, bonding social capital (outward and inward) only significantly affects certain *types* of corruption. Both types appear to particularly affect public and political corruption, which are captured by the CPI index. Bonding social capital does not seem to have much impact on other types of corruption such as petty corruption and corruption within the private sector in which personal ties do not matter as much. Moreover, public opinion surveys such as the World Value Survey (*CORR5*) may contain too much noise due to 'social desirability bias' (people tend to answer these surveys in such a way that they think is socially acceptable) or simply because the public do not know about corruption due to the bias in media focus.

Nonetheless, the results from the first model demonstrate that there is indeed a *direct association* between bonding social capital and the level of perceived corruption, particularly when it discourages trust and cooperation towards outsiders (outward bonding social capital). The effect is significant even after controlling for other factors which may influence corruption and the level of generalised trust within the country. That is when the level of bonding social capital is high (and discourages trust and cooperation towards outsiders) people are more likely to engage in nepotism and corruption, especially those who have discretionary power within the public offices. Contrary to previous studies which focus mainly on bridging social capital or generalised trust and concludes that social capital can help to reduce corruption, this study provides empirical evidence that a different kind of social capital, namely bonding social capital can *increase* corruption. In other words, if Nigeria could trim down the degree of outward bonding social capital to that of Mexico, their level of perceived corruption (as measure by the 1998 CPI) would be reduced by 1.4 points - *This is the first contribution of this study.*

TABLE 6B
(BASELINE MODEL)
CORRUPTION AND INWARD BONDING SOCIAL CAPITAL (IN_BOND)

	DEPENDENT VARIABLES									
	high score = less corruption		high score = less corruption		high score = less corruption		high score = more corruption		high score = more corruption	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
REGRESSORS	1998 CPI	1998 CPI	WB's Control of corruption	WB's Control of corruption	1997 WDR Survey	1997 WDR Survey	Inversed CPI 1997-99	Inversed CPI 1997-99	WVS 1994-99	WVS 1994-99
Inward Bonding Social Capital	-0.21 (2.83)**	-0.19 (2.10)*	-0.11 (3.37)**	0.00 (-0.05)	-0.06 (-0.99)	-0.08 (-1.16)	0.12 (-0.56)	0.08 (-0.30)	0.04 (-0.03)	-0.91 (-0.61)
Regulatory Capacity Index	4.09 (16.26)**	3.78 (11.61)**	1.68 (20.70)**	2.12 (18.27)**	1.33 (9.17)**	1.54 (5.94)**	-4.16 (6.94)**	-3.73 (4.37)**	-32.75 (6.20)**	-30.47 (6.15)**
Generalised Trust		0.01 (-1.29)		0.01 (-1.42)		-0.03 (2.51)*		-0.01 (-0.41)		-0.34 (-1.98)
Constant	3.93 (35.63)**	3.51 (9.92)**	-0.01 (-0.24)	-0.28 (2.44)*	3.80 (53.25)**	4.39 (16.06)**	6.15 (18.88)**	6.33 (7.56)**	71.51 (32.89)**	79.75 (17.12)**
Observations	82	39	180	53	70	30	83	39	49	49
R-squared	0.86	0.87	0.81	0.90	0.57	0.59	0.47	0.54	0.59	0.62
Ramsey RESET Test for omitted variables	5.75 [0.00]	8.74 [0.00]	26.45 [0.00]	11.57 [0.00]	2.81 [0.05]	1.70 [0.20]	1.59 [0.20]	4.75 [0.01]	4.18 [0.01]	3.70 [0.02]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	9.74 [0.00]	5.98 [0.05]	9.82 [0.00]	6.66 [0.03]	9.71 [0.00]	7.97 [0.02]	9.55 [0.00]	6.31 [0.04]	9.26 [0.01]	5.47 [0.06]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Ramsey RESET Test for omitted variables (H_0 : The model has *no* omitted variables); and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

6.2 ‘Indirect Effect’ of bonding social on corruption (using Multiple Regression)

In order to test for the indirect effect, the second Multiple Regression is employed as illustrated in equation [2]. If bonding social capital indirectly affects the level of corruption by making corruption more predictable and reducing the moral cost associated with corruption, once these channelling factors enter the model the partial coefficient for bonding social capital, β_1 , is expected to be insignificant. As mentioned above, this is a rather strong assumption and there may be other factors which could explain the indirect association between bonding social capital and corruption such as the effect of ‘personal social cost’ for not engaging in corruption i.e. *the personal social cost* for being excluded from the group as discussed above. However, there is currently no measure for this variable and thus, it cannot be considered in the present empirical analysis. The results shown in *Tables 7A* and *7B* are for the first and second measures of bonding social capital respectively.

Once the two channelling factors are added to the regression models, the coefficients for both outward and inward bonding social capital indeed become *insignificant*. The measure for predictability of corruption reported in both tables is from the 1997 World Development Report (*PRECOR1*)¹⁵, and is significant in most specifications. The measure for moral costs associated with corruption, on the other hand, appears to be insignificant in all specifications. All specifications now pass both the Ramsey test for omitted variables and the D’Agostino-Pearson omnibus test for normality of the residuals (p-values > 0.05 and thus, accepting the null of no omitted variable and normality of the residuals respectively).

¹⁵ I have also replicated the model using the measure from World Business Environment Survey (*PRECOR2*) and also the sum of both measures (*SUM_PRECOR*), but the results are insignificant.

TABLE 7A
(SECOND MODEL)
CORRUPTION AND OUTWARD BONDING SOCIAL CAPITAL (OUT_BOND),
INCLUDING THE TWO CHANNELLING FACTORS (PRECOR1 & SMORALC)

REGRESSORS	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	(1)	(2)	(3)	(4)	(5)
	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997-99	WVS 1994-99
Outward Bonding Social Capital	-0.01 (-0.12)	-0.06 (-0.29)	0.02 (0.06)	0.37 (1.16)	-0.11 (-1.64)
Predictability of Corruption	-0.40 (-3.76)**	-0.17 (-3.94)**	-0.44 (-7.49)**	0.73 (3.24)**	3.94 (2.14)*
Moral Cost of Corruption	0.02 (1.06)	0.01 (0.72)	0.00 (0.11)	-0.01 (-0.21)	-0.00 (-0.02)
Regulatory Capacity Index	3.29 (7.98)**	1.80 (9.06)**	0.73 (3.35)**	-2.61 (2.06)*	-14.63 (-1.95)
Generalised Trust	0.02 (1.30)	0.01 (0.58)	0.00 (-0.43)	0.02 (0.30)	-0.38 (-1.31)
Constant	5.48 (5.31)**	0.77 (2.40)*	6.83 (15.62)**	0.67 (0.25)	56.87 (3.47)**
Observations	21	27	26	21	27
R-squared	0.91	0.91	0.89	0.60	0.63
Ramsey RESET Test for omitted variables	1.16 [0.37]	2.92 [0.06]	0.59 [0.63]	0.09 [0.96]	2.24 [0.11]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	5.61 [0.06]	4.5 [0.11]	4.70 [0.09]	2.62 [0.27]	7.30 [0.03]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Ramsey RESET Test for omitted variables (H_0 : The model has *no* omitted variables) and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

TABLE 7B
(SECOND MODEL)
CORRUPTION AND INWARD BONDING SOCIAL CAPITAL (IN_BOND)
INCLUDING THE TWO CHANNELLING FACTORS (PRECOR1 & SMORALC)

REGRESSORS	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	(1)	(2)	(3)	(4)	(5)
	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997-99	WVS 1994-99
Inward Bonding Social Capital	-0.19 (-1.07)	-0.02 (-0.35)	-0.10 (-1.88)	-0.16 (-0.30)	-1.93 (-1.65)
Predictability of Corruption	-0.41 (3.62)**	-0.17 (3.87)**	-0.44 (8.55)**	0.91 (3.99)**	3.68 (2.07)*
Moral Cost of Corruption	0.00 (0.45)	0.01 (-0.79)	-0.01 (-1.10)	-0.02 (-0.34)	-0.20 (-0.79)
Regulatory Capacity Index	2.75 (4.07)**	1.71 (8.36)**	0.48 (2.19)*	-2.59 -2.02	-19.42 (2.62)*
Generalised Trust	0.02 (-0.96)	0.01 (-0.54)	-0.01 (-0.96)	0.00 (-0.02)	-0.50 (-1.82)
Constant	5.96 (6.56)**	0.75 -1.95	7.09 (16.42)**	0.33 -0.11	64.93 (3.92)**
Observations	21	27	26	21	27
R-squared	0.92	0.90	0.91	0.58	0.65
Ramsey RESET Test for omitted variables	0.15 [0.92]	2.89 [0.06]	0.61 [0.62]	0.15 [0.93]	2.79 [0.07]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	4.89 [0.09]	4.54 [0.10]	3.65 [0.16]	4.90 [0.09]	7.37 [0.03]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Ramsey RESET Test for omitted variables (H_0 : The model has *no* omitted variables) and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

6.3 ‘Indirect Effect’ of bonding social on corruption (using Two-Stage Least Square)

As a second test for the ‘indirect effect’, Two-Stage Least Square Estimator (2SLS) is used and despite the fact that the results from the second model show that only predictability of corruption seems to provide the indirect channelling mechanism, both the predictability and moral cost of corruption are tested in two separate 2SLS models. In both specifications, bonding social capital and the proportion of Protestant within the population are used as the main regressors (or ‘instruments’)¹⁶ in the first-stage regressions. *Tables 8A* and *8B* show the results from the first specification (using predictability of corruption as the channelling factor) for outward and inward bonding social capital respectively.

In both tables, the last four rows report diagnostic tests, which include the Hansen-J test statistics for validity of the ‘instruments’, the Shea partial correlations between the excluded ‘instruments’ and the endogenous regressor from the first-stage regression, the F-test for joint significance of the excluded ‘instruments’ from the first-stage regression (relevance test), and the D’Agostino-Pearson omnibus test for normality of the residuals. The results for outward bonding social capital (*Tables 8A*) are in line with those from the second model which suggest that outward bonding social capital affects the level of perceived corruption by increasing the degree of predictability of corrupt transactions, even when controlling for the level of generalised trust within the country. This is shown by the significant coefficients of the predictability of corruption variable for all specifications, except for column 2 - when the World Bank’s Control of Corruption index is used as dependent variable. The significant models pass the Hausman test (Hansen-J) for validity of the ‘instruments’ (H_0 : The instruments are *not* correlated with the error term and the model is correctly specified) and the ‘instruments’ also pass the relevance test in the first-stage regression.

Slightly different results are obtained for inward bonding social capital. Here, the predicted values for the measure of predictability of corruption from the first-stage regression appear to be significant only when the measures of corruption from the 1998 CPI and the 1997 WRD are used as dependent variable (columns [1], [3] and [4]). However, the instruments do not pass the relevance test (F-test) in the first-stage regressions. It is important to note that because list-wise deletion method is

¹⁶ Although as mentioned above, this is not IV in a conventional sense. The 2SLS is carried out using `ivreg2` syntax in STATA software with robust standard errors. I first run the 2SLS using both measures of predictability of corruption and moral cost of corruption *jointly* as endogenous regressors as in [5]. However, the moral cost of corruption appears to be insignificant in all specifications. More importantly, the number of observations is significantly reduced (N=12) when both channelling factors enter the 2SLS model at the same time. This makes the sample size extremely small and the resulting bias of the estimations would prevent any meaningful interpretation of the model. Consequently, I decided to test each channelling factor separately.

employed for all the models, the resulting sample size is rather small when all variables are included in the model (N = 24). This poses a problem for the Hansen-J test since its power is limited when a finite (small) sample is used (Cameron and Trivadi, 2005).

TABLE 8A
TWO-STAGE LEAST SQUARE MODEL

SPECIFICATION 1: PREDICTABILITY OF CORRUPTION
(using *Outward Bonding Social Capital* as one of the instruments)

	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	(1)	(2)	(3)	(4)	(5)
REGRESSORS	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997- 99	WVS 1994- 99
Predictability of Corruption	-0.45 (3.24)**	-0.13 (-1.64)	-0.44 (4.74)**	1.41 (2.85)**	5.37 (2.37)*
Regulatory Capacity Index	3.28 (7.09)**	2.03 (9.20)**	0.74 (3.16)**	-1.41 (-1.20)	-18.73 (2.61)**
Generalised Trust	0.01 (-1.17)	-0.01 (-0.49)	-0.01 (-0.92)	-0.02 (-0.34)	-0.09 (-0.34)
Constant	6.37 (7.71)**	0.72 -1.58	6.89 (12.31)**	-3.00 -0.88	40.93 (2.72)**
Observations	23	23	23	23	22
R-Squared (centred)	0.92	0.91	0.89	0.57	0.74
Hansen-J statistic for validity of the instruments	0.15 [0.70]	0.14 [0.71]	0.06 [0.80]	0.04 [0.84]	0.83 [0.36]
First-stage Shea partial correlation of the excluded instruments	0.34	0.34	0.34	0.34	0.34
F-Test for joint significance of the excluded instrument from first-stage regression	4.66 [0.02]	4.66 [0.02]	4.66 [0.02]	4.66 [0.02]	4.56 [0.02]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	4.53 [0.10]	3.20 [0.20]	3.67 [0.16]	4.89 [0.09]	5.15 [0.08]

TABLE 8B
TWO-STAGE LEAST SQUARE MODEL

SPECIFICATION 1: PREDICTABILITY OF CORRUPTION
(using *Inward Bonding Social Capital* as one of the instruments)

	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	(1)	(2)	(3)	(4)	(5)
REGRESSORS	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997- 99	WVS 1994- 99
Predictability of Corruption	-0.41 (2.33)*	-0.09 -0.60	-0.40 (3.87)**	1.42 (2.06)*	3.98 -1.17
Regulatory Capacity Index	3.37 (7.70)**	2.10 (7.08)**	0.80 (3.37)**	-1.40 -0.83	-21.17 (2.69)**
Generalised Trust	0.01 -1.08	-0.01 -0.65	-0.01 -1.20	-0.02 -0.29	-0.02 -0.09
Constant	6.12 (5.88)**	0.49 -0.57	6.69 (10.34)**	-3.02 -0.72	49.01 (2.32)*
Observations	23	23	23	23	22
R-Squared (centred)	0.92	0.90	0.89	0.57	0.75
Hansen-J statistic for validity of the instruments	0.87 [0.35]	0.04 [0.83]	3.52 [0.06]	0.14 [0.71]	3.32 [0.06]
First-stage Shea partial correlation of the excluded instruments	0.15	0.15	0.15	0.15	0.19
F-Test for joint significance of the excluded instrument from first-stage regression	1.53 [0.24]	1.53 [0.24]	1.53 [0.24]	1.53 [0.24]	2.05 [0.16]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	4.33 [0.11]	2.92 [0.23]	3.52 [0.17]	4.89 [0.09]	4.53 [0.10]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Hansen J statistics (H_0 : All instruments are not over-identified), F-Statistics, and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

Tables 9A and 9B show the results from the second channelling factor – the moral cost of corruption – which does not appear to provide a good indirect channelling mechanism. This is evident in both tables as the predicted values of moral cost of corruption from the first stage regression is only significant in one specification which is when the 1998 CPI is used as dependent variable (column [1] of both tables). However, the model suffers ‘weak instrument’ problem as shown by the weak first-stage Shea partial correlation of the excluded instruments, particularly in *Table 9A* when outward bonding social capital is used as one of the ‘instruments’. Moreover, the model also fails the F-test for joint significance of the instruments, albeit passing the Hansen-J test. This suggests that bonding social capital does not influence the level of perceived corruption by reducing the moral cost associated with corruption. The possible reason why moral cost is not significant as a channelling factor may be explained by the situations whereby those involved in corrupt transactions *do* feel guilty about their actions (high moral cost) and know that their actions create negative externalities towards others, but they are forced to engage in corruption due to the peer pressure from their families and friends. In this situation, the moral cost associated with corruption is still high but the potential ‘personal social cost’ from not abiding by the corrupt normative rules outweighs both the moral cost and the probability of being caught and punished. In this situation, the effect of bonding social capital on corruption does not channel through its effect on the level of moral cost but instead, through the ‘personal social cost’. Nevertheless, the results do provide support for the hypothesis that bonding social capital *indirectly* affects the level of perceived corruption by increasing the degree of predictability of corruption – which is *the second contribution of this study*.

Similar to other studies in this field, there are some caveats which need to be taken into account. Firstly, the data for the channelling factors are very limited both in terms of the country coverage and time scale. This is particularly true for the predictability of corruption, which is only available in 1997 and although it is available for 72 countries, when the dataset is used with other variables, list-wise deletion is employed, which results in a significant reduction in the number of observations. In addition, due to such small sample, country-specific characteristics of countries included may also introduce bias to the results. Secondly, the measures for bonding social capital had to be imputed for methodological reason, as mentioned above. Although a number of diagnostic tests are carried out in order to check for the robustness of the imputed dataset, this process may still create additional noises in the data. Thirdly, there may be other mechanisms which could explain the association between bonding social capital and corruption but are not included in the models.

TABLE 9A
TWO-STAGE LEAST SQUARE MODEL
SPECIFICATION 2: MORAL COST OF CORRUPTION
 (using *Outward Bonding Social Capital*)

	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	1	2	3	4	5
REGRESSORS	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997-99	WVS 1994- 99
Moral Cost of Corruption	0.26 (2.14)*	0.10 (-1.46)	-0.95 (-0.20)	-0.28 (-1.51)	-1.84 (-0.75)
Regulatory Capacity Index	4.98 (6.89)**	2.30 (6.40)**	-0.77 (-0.06)	-4.40 (2.66)**	-34.11 (2.94)**
Generalised Trust	0.09 (2.34)*	0.04 (-1.76)	-0.49 (-0.21)	-0.09 (-1.59)	-0.73 (-1.24)
Constant	-1.74 (-0.79)	-2.33 (-1.80)	28.85 (-0.23)	11.90 (3.55)**	113.71 (2.56)*
Observations	36	38	22	36	36
R-Squared (centred)	0.53	0.58		0.13	0.20
Hansen-J statistic for validity of the instruments	1.24 [0.27]	0.51 [0.48]	0.00 [0.95]	5.41 [0.02]	1.35 [0.25]
First-stage Shea partial correlation of the excluded instruments	0.04	0.03	0.00	0.04	0.02
F-Test for joint significance of the excluded instrument from first-stage regression	0.64 [0.53]	0.45 [0.64]	0.02 [0.98]	0.56 [0.57]	0.31 [0.73]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	1.10 [0.58]	1.35 [0.51]	2.79 [0.25]	0.78 [0.68]	1.34 [0.51]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Hansen J statistics (H_0 : All instruments are not over-identified), F-Statistics, and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

TABLE 9B
TWO-STAGE LEAST SQUARE MODEL
SPECIFICATION 2: MORAL COST OF CORRUPTION
 (using *Inward Bonding Social Capital*)

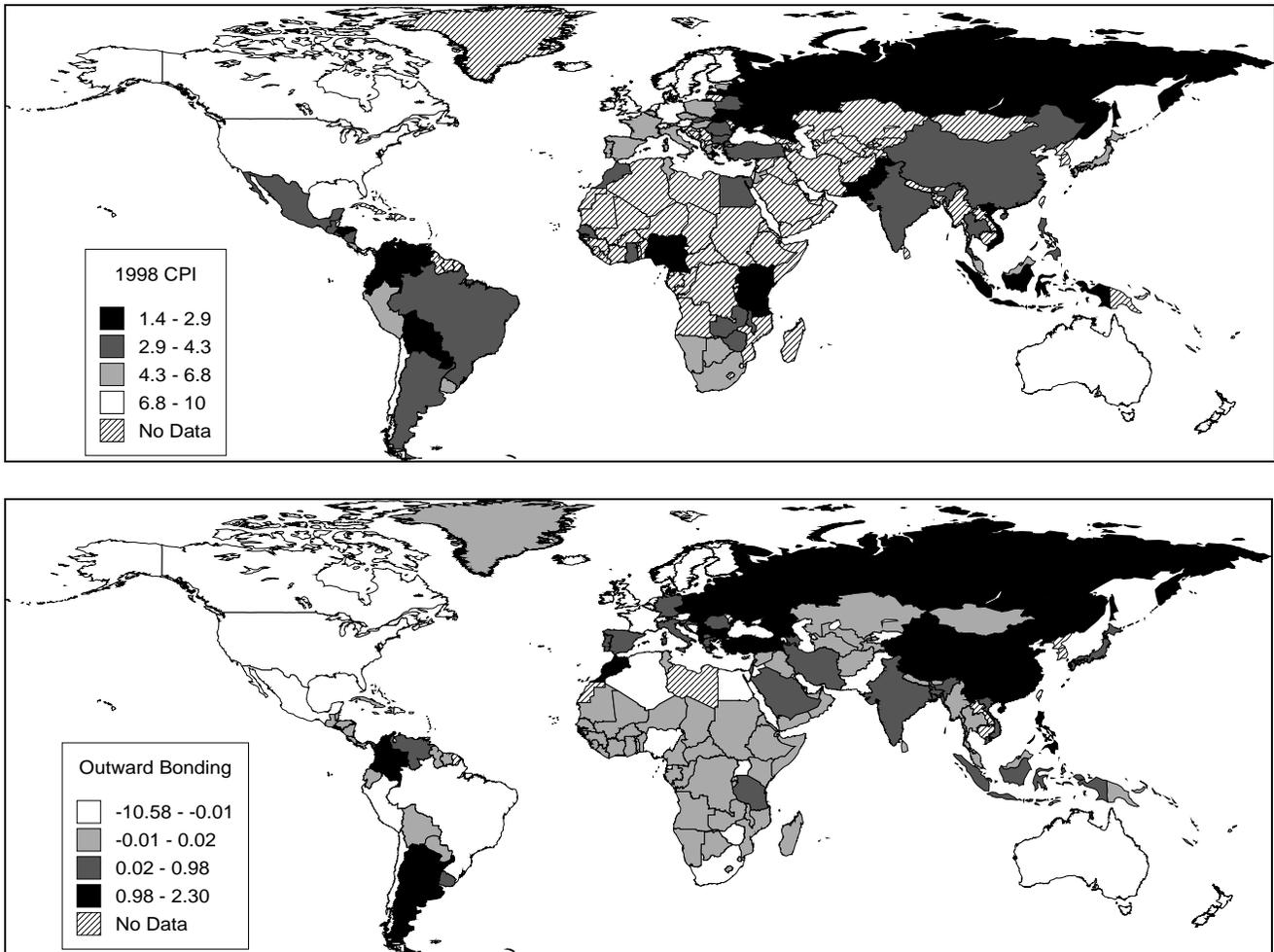
	DEPENDENT VARIABLES				
	high scores = less corruption			high scores = more corruption	
	1	2	3	4	5
	1998 CPI	WB's Control of corruption	1997 WDR Survey	Inversed CPI 1997-99	WVS 1994- 99
REGRESSORS					
Moral Cost of Corruption	0.13 (2.99)**	0.01 -0.49	0.02 -0.49	-0.06 -0.47	0.35 -0.49
Regulatory Capacity Index	4.61 (13.07)**	2.13 (12.74)**	1.59 (5.45)**	-4.01 (3.79)**	-29.65 (5.62)**
Generalised Trust	0.05 (2.65)**	0.01 -1.64	-0.02 -0.86	-0.03 -0.78	-0.18 -0.81
Constant	0.70 -0.70	-0.57 -1.23	4.02 (3.49)**	7.67 (2.88)**	71.84 (5.09)**
Observations	36	38	22	36	36
R-Squared (centred)	0.81	0.88	0.47	0.50	0.67
Hansen-J statistic for validity of the instruments	2.96 [0.09]	3.99 [0.05]	3.76 [0.05]	7.58 [0.01]	1.88 [0.17]
First-stage Shea partial correlation of the excluded instruments	0.14	0.16	0.19	0.19	0.16
F-Test for joint significance of the excluded instrument from first-stage regression	2.53 [0.09]	3.17 [0.05]	1.95 [0.17]	3.67 [0.03]	2.92 [0.06]
D'Agostino-Pearson Omnibus Test for Normality of the Residual	2.48 [0.29]	5.04 [0.08]	5.89 [0.06]	3.95 [0.14]	5.13 [0.08]

Notes: Robust t-statistics in parentheses, * significant at 5%; ** significant at 1%; p-values in parentheses for the Hansen J statistics (H_0 : All instruments are not over-identified), F-Statistics, and D'Agostino-Pearson Omnibus Test for Normality of the Residual (H_0 : The residual is normally distributed).

Despite these caveats, the results provide informative empirical evidence that bonding social capital increases the level of perceived corruption both directly and indirectly by making corruption more predictable. In addition, the slight difference in the results between the outward bonding social capital (which represents the low level of cooperation towards those outside one's narrow social network), and the inward bonding social capital (which represents the degree of closeness of one's family and friends) implies that it is not the high level of bonding social capital per se which affects corruption. But it is when bonding social capital discourages the individuals to cooperate with others outside their narrow social circles that nepotism and corruption are likely to be fostered (see *Figure 2*).

In other words, people who are only concerned about their own families and friends whilst disregarding others outside their own groups are more likely to engage in corruption. Moreover, it is evident from this study that bonding social capital influences certain kinds of corruption i.e. political and public corruption, more than others. That is in a society where bonding social capital enables exclusion of outsiders and reduces cooperative behaviour, when one is given discretionary power in the public or political offices, he is more likely to use the power to help his friends and family and thus, engage in nepotism and corruption. This is a tentative conclusion which needs to be investigated further at a micro-behavioural level. This is because one of the problems with using secondary survey data is that it is difficult to know the extent to which survey-measured values and attitudes are correlated with the actual economic behaviour as measured in experiments (Gächter et. al., 2004), particularly when the survey in question involves sensitive questions such as those concerning corruption. The respondents may be reluctant to expose themselves as corrupt, which could result in response bias. This could partly explain, to a certain extent, the slight diverse results obtained when different measures of corruption are used.

Figure 2:
THE WORLD MAP OF OUTWARD BONDING SOCIAL CAPITAL AND CORRUPTION (1998 CPI)



Source: The World Value Survey (1994-99) and Transparency International (1998 Corruption Perception Index -CPI).
Note: Low CPI scores means *high* level of perceived corruption (more corrupt) and high scores means *less* corrupt.

7 Concluding Remarks

This study extends the analysis of social capital and corruption by considering a different kind of social capital, namely bonding social capital, which is entrenched in the close-knit culture and characterised by the norms of particularised trust and specific reciprocity. It also distinguishes between different types of bonding social capital since bonding social capital does not always lead to corruption. It is when bonding social capital creates in-group vs. out-group mentality, and thus, discourages trust and cooperation towards outsiders that corruption is likely to result. Finally, this study examines both *direct* and *indirect* effects of bonding social capital on corruption, which has not been done in previous studies.

The results confirm that there is indeed a *direct* effect between bonding social capital and corruption, particularly public and political corruption. This relationship is significant even when controlling for the level of bridging social capital (or generalised trust) within the country and other factors which may influence corruption. The paper also tests for the *indirect effect* of bonding social capital on corruption via the two channelling mechanisms, namely predictability and moral cost of corruption. In doing so, firstly a suggestive test is carried out by adding the two causal factors into the Multiple Regression model between corruption (dependent variable) and bonding social capital (independent variable). The testing hypothesis is that if bonding social capital affects corruption through these two channelling factors, once these variables enter the model, the coefficient of bonding social capital should become insignificant. The results support this hypothesis, but only for the degree of predictability of corruption. As a further test, Two-Stage Least Square estimator is employed. The results from the 2SLS show that bonding social capital affects corruption indirectly by reducing opportunistic behaviours of the corrupters and thus, makes corruption more predictable. In other words, when the level of bonding social is high, the briber can be confident that after the bribe is paid the 'goods' will be delivered as agreed. However, only the measure for outward bonding social, which represents the extent to which bonding social capital reduces the levels of trust and cooperation towards outsiders, pass the F-test for joint significance of the excluded instruments in the first-stage regression, when the level of generalised trust is controlled for. This result leads to a tentative conclusion that bonding social capital is likely to increase the level of corruption only when it *discourages* cooperation towards outsiders. In other words, people who are only concerned about their own families and friends whilst disregarding others, are more likely to engage in nepotism and corruption. The moral cost of corruption, on the other hand, does not seem to provide an indirect mechanism for the relationship between bonding social capital and corruption.

Even though one needs to accept the fact that there are no precise measures of corruption and social capital, this study provides informative findings which can help shed light on the question: “*Why in certain societies personal ties lead to corruption but in others they do not?*” – which is the underlying contribution of this study. The policy implications which emerge from this study are firstly, policymakers, instead of focusing solely on institutional changes, need to start putting more emphasis on building and encouraging generalised trust and reciprocity amongst the citizen, through civic education and increasing involvements in community work, encouraging the feeling of empathy for those who do not fare well, and increasing redistribution of resources from the well-off to the poor (Uslaner, 2004). This will help open up the close-knit networks and alleviate ‘in-group’ vs. ‘out-group’ mentality. The area where governments probably have direct ability to generate positive social capital is education. Educational institutions do not simply transmit human capital; they also pass on social capital in the form of social rules and norms. This is true not just in primary and secondary education, but also in higher professional education as well. However, this is not to say that positive or good social capital is the ultimate solution to corruption. Rebuilding social capital needs to be done simultaneously with institutional reforms. If institutions are operating efficiently, corruption would be more difficult to emerge. Consequently, the second policy implication is that institutional reforms need to put more emphasis on the ‘people’ within the institutions, and not just the structure or the organisation of such institutions. This is because bonding social capital is likely to lead to corruption when ‘conflicts of interests’ arise i.e. when officials have to decide between helping their families and friends or following the rules of law and norm of fairness. A micro-behavioural analysis may be useful to explore other indirect mechanisms which can help channel the effect bonding social capital towards corrupt behaviour.

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