Systematic review

The evidence of the impact on investment rates of changes in the enforcement of contracts

A systematic review

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November 2012

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This material has been funded by the Department for International Development. The views expressed do not necessarily reflect the views of the Department for International Development. The authors are part of the CINVE and Instituto de Economía, Universidad de la República, Uruguay and were supported by the International Initiative for Impact Evaluation (3ie) and the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre).

The EPPI-Centre reference number for this report is 2012.

This report should be cited as:

Aboal D, Noya N, Rius A (2012) A systematic review on the evidence of the impact on investment rates of changes in the enforcement of contracts. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

ISBN: 978-1-907345-41-8

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Abbreviations

BERI	Business Environment Risk Assessment
CE	Contract enforcement
CI	Causal inference
CIM	Contract-intensity money
CORE	Center for Operations Research and Econometrics
DfID	Department for International Development (UK)
FDI	Foreign direct investment
FGLS	Feasible generalised least squares
GDP	Gross Domestic Product
GMM	Generalised method of moments
ICRG	International Country Risk Guide
IFC	International Finance Corporation
IFS	International Financial Statistics
IMF	International Monetary Fund
M&A	Mergers and acquisitions
NIE	New institutional economics
OLS	Ordinary least squares
PPI	Private participation in infrastructure
R&D	Research and development
SSRN	Social Sciences Research Network
SUR	Seemingly unrelated regression
TSCML	Two stage conditional maximum likelihood
UNIDO	United Nations Industrial Development Organization
WoE	Weight of evidence

Summary

This systematic review focuses on the evidence about one specific causal mechanism: from better enforcement of contracts to higher rates of capital accumulation.

The rationale for the review does not rest exclusively on the (still debated) causal effect of investment on growth, but also on the fact that donors and governments do invest resources and political capital in improving the business environment, and in particular in seeking to improve the enforcement of contracts. While some of these efforts could be simply justified on grounds of promoting the rule of law, the underlying assumption for many of those reform efforts is that investments will be unleashed by them, so analysing systematically the evidence in favour of that assumption may eventually help in deciding what priority those reforms should have.

The systematic review followed strict methodological guidelines contained in a protocol reviewed and extensively commented on by three external referees. The team also had support from the EPPI-Centre's experts. The different drafts of the synthesis were reviewed by anonymous referees, who provided extensive comments reflected in this version.

Initially, inclusion-exclusion criteria were applied to the results of the comprehensive and systematic searches of relevant scholarly databases and search engines, and to papers identified by forward and backward citation tracking. We screened titles and abstracts of 2,546 non-duplicated studies. Titles and abstracts were double screened by two different reviewers.[1] A total of 175 studies were classified as included for full-text screening. After applying the inclusion and exclusion criteria to the full text, 153 reports were excluded and 22 moved on to the mapping and synthesis stages.

To assess the quality of the included studies, the review team used a critical appraisal approach based on a multidimensional concept of quality in research. This approach covers quality of reporting, methodological rigour, conceptual depth and breadth, and relevance. The quality assessment is done with two purposes: first, to exclude studies that clearly do not meet minimum professional/academic standards; second, to establish a basis for assessing synthesis results.

Cross-country evidence seems to dominate the relevant body of research (more than half of the quantitative studies). This is reflected in the geographic scope of the studies as well as the units of analysis. The prevailing research designs are cross-section and panel data regressions, with estimation methods customised to the specificities of data sets, variables, and/or reflecting trends in econometric 'best practice'. The study of the microeconomics of contract enforcement and investment can be said to be seriously underdeveloped in the literature.

Overall, the evidence gathered through this systematic review provides some support for the claim that more effective contract enforcement promotes higher levels of investment, but it is weak. First, there is only one study that unambiguously links an intervention or reform to enhance contract enforcement to changes in investment patterns. Second, few of the studies go beyond a generic discussion of direct and indirect effects to actually test the plausible indirect causal channels. Third, a majority of studies do very little or nothing in terms of robustness checks, or the

[1]Unless otherwise noted, in this report the term 'reviewer' refers to one of the three principal investigators and authors of this report. When we attribute something to the 'review team', it means all three reviewers participated in the discussion and decision.

strenuous but necessary attempts to rule out alternative explanations for the empirical findings.

Almost all the studies implicitly or explicitly adhere to a basic story stating that effective third-party enforcement enables more complex contracting and that contract uncertainty will tend to depress investment by affecting expected returns, increasing investment costs, restricting access to key resources or making some complex transactions unfeasible.

The main non-trivial mechanisms found in the studies are: weak enforcement encourages hold-up strategies that affect investments through impact on cash flows and indirectly through greater downward uncertainty of returns; enhanced legal enforcement in transition economies with financial repression may limit capital available to the private sector, and thus depress private investment; weak third-party enforcement involves higher costs to firms related to the need to get settlement through alternative mechanisms, affecting investment; and better contract enforcement facilitates the processes through which efficient-investing industries receive capital, and favours, in particular, 'contract-intensive' industries.

Based on a 'quick and rough' synthesis of the literature one might be tempted to conclude that institutional change that fosters reliability of contracts (in some sense) will be likely to be rewarded with greater additions to a society's stock of capital. This quick and rough impression is probably what policy makers (including some who have been sponsors of a good part of this literature) take away from casual observation of the research that has developed in the last couple of decades.

However, the suspicion of publication bias in this literature is quite strong and fed by the observation that those few studies that do not find a 'positive' are constructed to make the negative or null the 'expected' result, or do not have contract enforcement per se as the single key intervention in their empirical analysis. Moreover, in some of these cases the ambiguity or negative results are inferred by us, the reviewers, and not stressed by the authors. This means that there is ample scope, and need, to enhance the evidentiary basis for a 'conventional wisdom' hypothesis that has important policy implications but currently has only weak support from the evidence.

1. Background

1.1. Introduction and policy relevance

Even if development is conceptualised to be broader than economic growth, the growth of incomes and wealth are generally recognised to be powerful means to expand opportunities and reduce deprivation (e.g. Sen, 1999). For most development agencies, poverty reduction is the primary concern. Since 2000, the broader Millennium Development Goals have guided the efforts of those agencies, as well as those of many of the 180+ governments that endorsed them. It is for these reasons that many development agencies are interested in the conditions and factors that trigger and sustain growth and, among various strategies, they have been supporting legal, regulatory and policy reforms to attain that (World Bank, 2004; White, 2008).

Growth is generally assumed to depend on sustaining high rates of investment, not exclusively but fundamentally by the local private sector (DFID, 2009). The key role of capital accumulation in economic development has been almost a truism in economics since the classical economists (Smith, Marx, Ricardo). Investment was one of the obvious ways to promote economic growth in the basic as well as in the more sophisticated 'modern' growth models (Solow, 1956; Barro, 1991; Mankiew et al., 1992), and the specific circumstances of underdeveloped economies in this regard have been extensively explored since development economics became a recognizable sub-discipline (see, e.g. Hirschman, 1958; Rostow, 1960; and various contributions in Meier and Seers, 1984).

The investment-growth assumption is straightforward for many practitioners and agencies, and supported by some of the evidence (Levine and Renelt, 1992; Hausmann et al., 2005), but it has also been challenged on empirical grounds as well (e.g. Dollar and Easterly, 1999; Devarajan et al., 2001). The latter group of scholars would claim that investment is at least partly endogenous – i.e. growth promotes investment – and that, particularly in low-income countries, low growth and low investment can both be symptoms of other underlying and more fundamental problems.

Among the factors that could determine growth and/or investment performance, institutions have become more prominent in the scholarly literature in recent years (North, 1990; Rodrik, 2000; Shirley, 2008). The literature has identified a host of growth and investment-relevant institutions, and their direct or indirect channels of influence. This has led to the 'business environment' and 'investment climate' approaches to institutional reforms that would unleash entrepreneurship and investment, and lead to more rapid growth and poverty reduction (see, e.g. OECD, 2004). Salient among the key institutions are those that protect investors from expropriation and those that determine how contracts are enforced. Though these two classes of institutions may overlap, they are not conceptually identical, and we will argue (as have done others; e.g. Acemoglu and Johnson, 2005) that it is analytically desirable to try to isolate the effects of institutions that serve each of those purposes separately. Various economic historians, including Douglass North (1990), have argued that the enforcement of contracts became more complex and significant for the economic process with increased specialisation, larger numbers of trading partners and geographic dislocation of transactions. This systematic review

seeks to uncover the available empirical evidence about the causal link from better enforcement of contracts to higher rates of capital accumulation.[2]

The review does not take it for granted that investment *strictly* causes growth (though it is justified, to some degree, by the assumption that facilitating investment will somehow benefit the growth process), nor does it examine all the linkages from quality of institutions to investment (e.g. we do not examine studies that focus on property rights institutions more broadly defined). Besides shedding light on a substantively important set of theoretical hypotheses, the rationale for the review rests particularly on the fact that donors and governments do allocate financial, human and political resources to improving the business environment, and in particular to trying to improve the enforcement of contracts. While some of these efforts could be justified simply on the normative importance of the rule of law, the underlying assumption for many of those reform efforts is that investments will be unleashed by them. Therefore, analysing systematically the evidence in favour of the latter assumption may eventually help in deciding how and how much to invest in supporting those reforms.

1.2. Conceptual framework

The key concepts that form the backbone of the new institutional economics (NIE) can be conveniently organised and summarised following the exposition by Douglass North (1990).[3] According to North, economic exchanges inevitably involve transaction costs and asymmetries of information, and it is to make these manageable (and the economic exchanges viable) that economic agents devise institutions.

Institutions are 'the humanly devised constraints that shape human interaction' (North, 1990, p. 3; all the following page citations are from the same volume). They can be formal or informal, their main difference being that *formal institutions* are written (and they may be complemented by a written code regulating the process that must be followed to obtain their enforcement). In fact, other than in their written character, formal institutions only differ in degree (of coercion) from informal ones (p. 46).

'Formal rules include political (and judicial) rules, economic rules, and *contracts*' (p. 47).[4] As with regard to *informal institutions*, they can be '(1) extensions, elaborations, and modifications of formal rules, (2) socially sanctioned norms of behaviour, and (3) internally enforced standards of conduct.' (p. 40). They may also stipulate enforcement mechanisms, as we will see.

As noted by Acemoglu and Johnson (2005), many economists and political scientists have become persuaded that institutions are a primary determinant of economic performance. However, in much of the literature, there has been a tendency to include a variety of economic institutions in a 'cluster' that presumably defines a favourable business environment (see below). In their work, Acemoglu and Johnson distinguish *property rights* institutions, which are the institutions constraining government and elite expropriation, from *contracting institutions*, which are the institutions supporting private contracts.

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[2]Other key determinants of investment include access to funds and the cost of borrowing, taxes and public expenditures (public and private investment have been found to be complementary or substitutes, depending on various circumstances), and the size of the market as determined, for example, by trade policies.

[3]North's and the NIE's framework are not free of conceptual problems (for some theoretical complications with North's, see Field, 2006; for an appraisal of the NIE see Rutherford, 1994). However, it is appropriate to borrow basic definitions from the original source, given that these definitions are widely used, and the framework provides a basic benchmark to which complications or refinements can be compared.

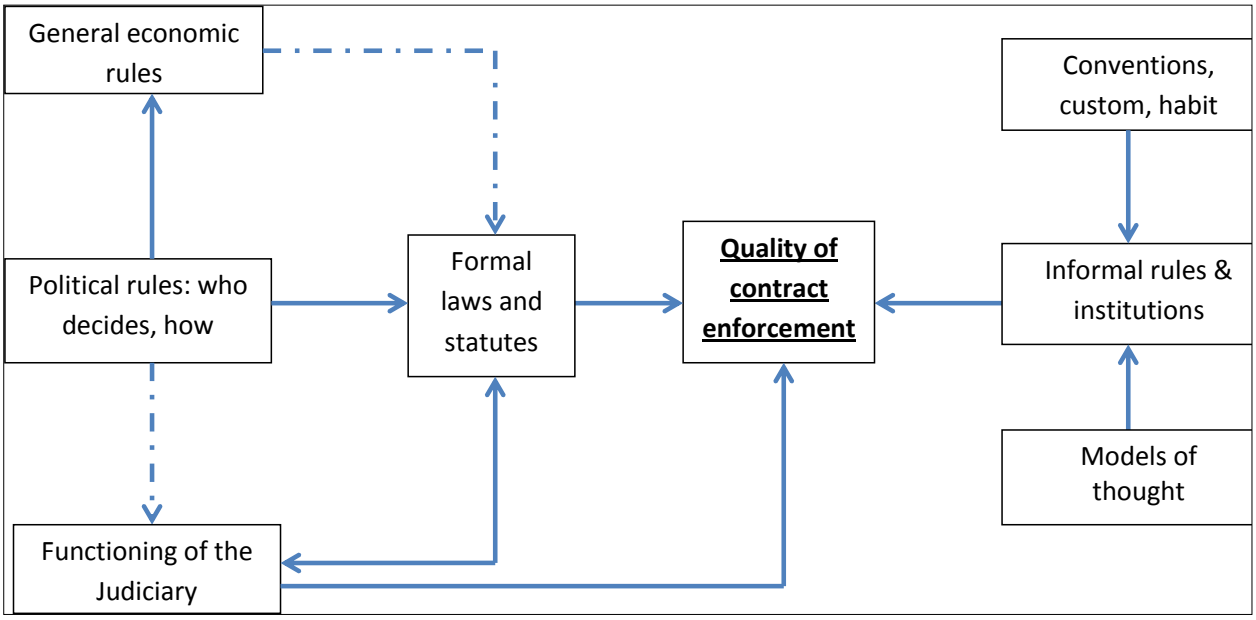
[4] Our italics.

The theory of institutions and economic performance advocated by North and others rests on societies' adoption of new institutional arrangements as the agents' response to the increasing complexity of economic transactions and 'contracts'. In pre-modern societies, transactions were essentially personalised exchanges among neighbours or acquaintances, and production and trade was on a small scale. Reputation and the risk of isolation from a community could function effectively to prevent or address opportunism. Gradually, impersonal exchanges among more distant parties became more frequent and economically significant, which led to the emergence of informal institutions with more explicit enforcement arrangements (these would include, for example, the ostracism of those who violated agreements, stipulated in unwritten codes of commercial conduct; p. 43).

With complex contracts that contain many hard-to-measure attributes about exchanged goods and services, and that are plagued by information asymmetries, and with the expansion of the reach of trade and the chances that transactions may never be repeated between the same two parties, it became necessary to devise third-party enforcement. In fact, in modern societies, the three forms of exchanges and enforcement arrangements (tacit, explicit-informal, and formal) co-exist, and even archaic and seemingly dysfunctional informal rules can have major impacts, as demonstrated in those cases when the same formal rules produce different outcomes in different societies (p. 36). Regarding the *actors* of the enforcement process, in contemporary societies, enforcement can come from societal sanctions, from second-party retaliation or from a coercive third party (typically, the state).

Figure 1.1 tries to capture the interrelations among different levels and types of rules and institutions in a society, converging in a given overall *quality of contract enforcement*.[5] For simplicity, we did not include a link to reflect the joint effect of formal and informal rules on overall quality of enforcement, but it is in the spirit of this conceptual framework that such a connection does exist and is often the prevalent way in which informal institutions influence outcomes.

Figure 1.1: Institutions and the quality of contract enforcement

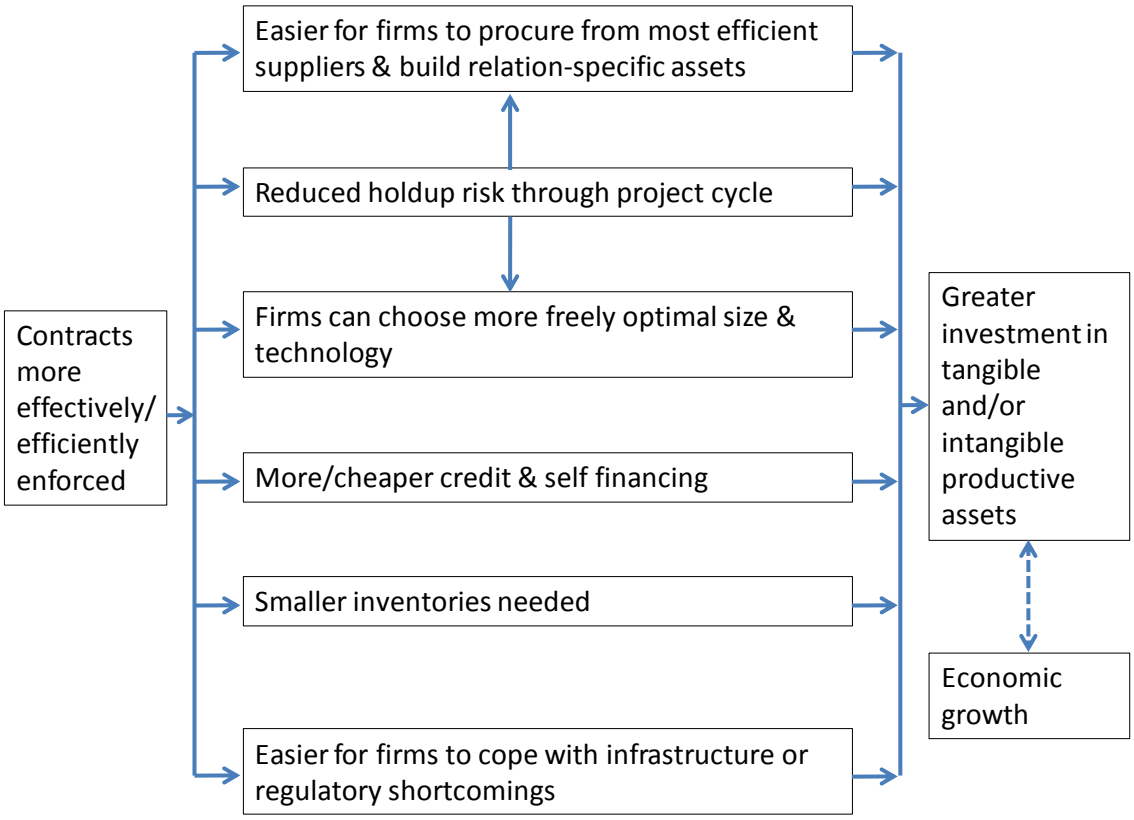


[5] 'Enforcement poses no problem when it is in the interests of the other party to live up to agreements. But without institutional constraints, self-interested behaviour will foreclose complex exchange, because of the uncertainty that the other party will find it in his or her interest to live up to the agreement.' (p. 33)

Given the diversity of contracts, legal traditions and codes and informal institutions, there is a range of possible innovations or reforms that may directly or indirectly impact on the enforcement of contracts. Typically, donor-funded reform programmes, for example, tend to tackle simultaneously a number of 'problems' in the written laws and the functioning of the judiciary (for example, fixing loopholes in commercial or civil laws, creating non-judicial arbitration mechanisms, facilitating access by aggrieved parties to the judicial system, reducing various costs of litigation, strengthening the capacities of the courts and judges). All these have some bearing on the speed and effectiveness of contract enforcement, and more broadly on 'the rule of law' (see, e.g. World Bank, 2001). Moreover, other policies not directly connected to the contents or enforcement of written laws may directly impact on contract enforcement more broadly defined. Woodruff (1998), for example, identifies a more-or-less direct effect of trade liberalisation on informal contract enforcement; investments in information and communications technologies, and in infrastructure available to courts and judges – i.e. public investments – may reduce litigation times and procedural mistakes, and therefore improve enforceability.

Analytically, weak enforcement of contracts has been argued to impact on investment through a number of channels. First, it could most directly influence the uncertainty surrounding a project (particularly the 'downward' uncertainty regarding net benefits), and therefore influence investors' decisions by increasing the project's costs, reducing its expected returns, causing both, or generally increasing the value of the 'wait' option (Dixit and Pyndick, 1994). Note that we are not considering here the risk of expropriation of the new assets created by the investment, which would correspond to the effects of 'property rights' institutions.

Figure 1.2: Causal channels from contract enforcement to investment



Second, weak enforcement could act indirectly on agents' willingness or ability to invest: it could determine a smaller optimal size for firms, induce them to choose less-efficient technologies, inhibit them from building relation-specific assets when those relations are dependent on contracts, or amplify the adverse effects of infrastructure or regulatory shortcomings. All these could in turn affect a firm's access to external financing, while capital markets and the banking industry might be more generally crippled by an environment of insecure contracts.

These various channels and some others may combine in complex ways. For example, some authors have found analytical support for the idea that weak enforceability increases firms' 'sensitivity to the arrival of new technologies and generates greater macroeconomic volatility' (Cooley, Marimon and Quadrini, 2004). To the extent that aggregate (output) volatility influences investment (a simple accelerator model could show this), there would be a causal chain from enforcement of contracts to rates/levels of capital accumulation. Others have argued that, through financial contracts, imperfect enforcement influences the size distribution and heterogeneity of firms, which could be reflected in aggregate investment levels (Monge-Naranjo, 2009). The list of causal channels represented in Figure 1.2 and just discussed is not exhaustive.

This figure summarises graphically a theory of change showing possible mechanisms through which contract enforcement may impact investment rates and economic growth.

1.3. Research background

Research on the effects of institutions on economic performance has grown very rapidly since the early 1990s. Theoretical developments such as North's contributions have prompted the search for and elaboration of indicators and proxies for the introduction of institutional variables in empirical analyses (see, e.g. Knack and Keefer, 1995 and Kauffman et al., 2004). The proliferation of datasets including such indicators have stimulated the empirical investigation of a range of research questions, but also some 'data-driven' research that has not shed much light on the specific causal pathways that link institutions and economic outcomes (Aaron, 2000; Keefer, 2004; Williams and Siddique, 2008).

As mentioned above, the enforcement of contracts can be 'private' (see, e.g. Gow et al. 2000). In these cases, it tends to be informal and harder to measure. That said, it follows almost tautologically from this that national states must have some form of centralised third-party, formal enforcement mechanisms, and that is why quality of contract enforcement has been most frequently measured as an attribute of nation states or their subnational jurisdictions (Djankov et al. 2003; Acemoglu and Johnson, 2005). Four broad approaches have been followed to generate cross-section and longitudinal variation in quality of enforcement, and luckily not all of them take legal jurisdictions as the unit of observation. In approximate chronological order:

- **Ratings based on experts' assessment**: effectiveness, efficiency and/or fairness of the national formal enforcement mechanisms is assessed by practitioners and other key informants and conveyed and aggregated through surveys (Knack and Keefer, 1995; but also La Porta et al. 1997; Staats et al. 2000; Berkowitz et al. 2003).
- **Indirect measures based on objective data**: The relative use of currency in comparison with contract-intensive money (i.e. bank deposits, etc.) has been proposed as an indicator of inadequate/weak contract enforcement based on readily available secondary data that would not be biased by subjective

assessments (though it may raise other validity issues: Clague et al. 1999; Williams and Siddique, 2008).

- **Surveys of economic agents' experiences and perceptions**: firm managers or other agents rate the quality of contract enforcement, or report on facts that would reflect such quality. Examples include farmers' responses to how important or harmful breaches of contracts were for them in a given period and how important ineffective legal enforcement was as a deterrent to expanding operations (Cungu et al. 2008), or firm owners or managers who report on their views of the work of the judiciary in World Bank-sponsored investment climate surveys (Brunetti et al. 1998; Dao, 2008).
- **Quantification of time and pecuniary costs to enforce standard contracts**: those costs are inferred from the backlog of unresolved cases or average observed duration of a case in the judiciary (e.g. Chemin, 2006), or alternatively legal experts are asked to estimate the time and financial costs incurred by a private party in obtaining its legitimate rights from breach of some simple and semi-universal economic contract (such as, e.g. collecting a bounced cheque, or evict a delinquent tenant; Djankov et al. 2003), or a more complex lending contract (Djankov et al. 2008).

The studies reviewed here yield estimates of quantitative effects of variation in the quality of contract enforcement on investment, based on observational data generated by one of the four broad methods, and of a cross-section, panel or longitudinal structure. Le (2004) is a good example of the conventional approach.

With some noteworthy exceptions, the empirical literature normally examines recorded variations in certain institutional arrangements that may or may not follow from deliberate reforms. This state of the field results from the nature of the object of analysis. Principles of territoriality of the law and equal treatment of all citizens, in addition to the typical complexity of legal reforms, make this an unfriendly territory for randomised controlled trials or other quasi-experimental strategies. In the best scenarios, diachronic variations are exploited in search of some support for causal hypotheses. In some cases, 'recall' indicators in cross-section samples are the best data available to attempt to detect a causal link.

The closest to the experimental ideal are clever exploitations of natural experiments (Chemin, 2006; Köhling, 2000). With observational evidence dominating the research field, instrumental variables methods are the other strategy to deal with potential endogeneity issues and provide some support for causal inference.

The broader weaknesses of much of the evidence (including issues of validity of indicators and broader empirical strategy), and the need to explore new research designs, have been noted by some key observers (Pande and Udry, 2005; Rodrik, 2005; Rehme, 2007; Shirley, 2008; Clemens and Bazzi, 2009; Deaton, 2010) To our knowledge, no assessment of research in this field has been based on a systematic review.

1.4. Aims and review question

The objectives of the review are to provide a synthesis of the available evidence about the impact of policies to enhance contract enforcement on investment. The review question is:

> *What is the evidence of the impact on investment rates of changes in the enforcement of contracts?*

The terms of the review question require some further elaboration, as they provide the foundations for the inclusion and exclusion criteria. The review focuses on

enforcement of contracts, and will exclude the enforcement of general economic or political rules. While the latter are typically associated with some enforcement mechanism, to the extent that they represent unilateral impositions of the state and affect a broader population of agents that are expected to abide by them, we will not include them in our study (*contracts* is therefore reserved for mostly bilateral and voluntary agreements).

We do not exclude informal (multilateral, bilateral, or third-party) enforcement from our review, even though most of the empirical literature focuses on formal, third-party (state-backed) enforcement.[6] In this review, we adopt a definition of relevant contracts that includes private contracts (as in Acemoglu and Johnson, 2005) but also the bilateral, mostly voluntary agreements that can be established between states and private parties (such as, e.g. when a private company gets a concession to build basic infrastructure).

Our review focuses on the impact of changes in the enforcement of contracts on rates of investment. We define *investment* as the accumulation of productive assets. These can be tangible (such as buildings, equipment or permanent plantations) or intangible (such as productive methods or commercial patents). We are interested in investments that enhance productive capacities and are made by either domestic or foreign agents; we are not interested in foreign 'direct investment' that simply acquires existing companies (or parts of them) without adding to the stock of productive assets (although the distinction is sometimes hard to make in practice).

1.5. Type of review

Our systematic review follows standard systematic review protocols regarding the mapping of the evidence, and adopts an approach to synthesis that combines narrative synthesis with 'quality-adjusted vote counting'. Quantitative meta-analysis was not considered a priority, and it was not undertaken. This was decided after observing the large heterogeneity of studies (in units of analysis, specifications of dependent and main independent variables, data structures and quality of the data).

To some extent, the review follows the 'realist synthesis' approach, regarding the attention paid to patterns of context-mechanism-outcome (Pawson et al. 2004).This means that we are not only interested in discerning whether changes in the enforcement of contracts have been followed by increases in investment, but also in the mechanisms that may cause changes in enforceability to influence agents' investment decisions and thus induce changes in aggregate investment levels.

1.6. User involvement

This systematic review was undertaken thanks to a grant from the DFID, awarded through a competitive call for proposals on predefined themes. One of the broad research questions was 'What is the evidence of the impact on investment rates of implementing the following investment climate reforms: starting a business, protecting investors and enforcing contracts?', and the DFID indicated that questions could be partitioned into some of its components for the purpose of submitting an application. To make the review manageable, our application proposed to address the last of the three sets of reforms identified in the question. As mentioned before, the DFID specifically identifies creating an environment that favours the development of businesses as a key objective of its private sector development strategy.

[6]Some carefully executed, analytically rich and extremely interesting studies on informal institutions, such as Besley, 1995, did not meet our eligibility criteria due to their exclusive attention to definition of property rights rather than contract enforcement.

It is therefore safe to assume that informing policy and practice (rather than contributing to scholarly literature or academic teaching) is the main purpose of the whole initiative, and therefore of this review.[7] From such 'revealed preference' of the funding donor, we chose to undertake a narrative synthesis which seeks 'to contribute to policy makers' and practitioners' "sense-making" – the way they understand and interpret the situations they encounter and the interventions they deploy' (Popay et al. 2006). The users have interacted with the review team through written comments on the draft protocol and intermediate outputs.

[7]The call invited applications to participate in 'a cutting – edge pilot to increase the use of evidence in policy and contribute directly to shaping international development policy and practice'.

2. Methods used in the review

2.1. Identifying and describing studies

In this section we describe the methodology used to identify and map the relevant studies for this review, i.e. those studies that address our review question:

> *What is the evidence of the impact on investment rates of changes in the enforcement of contracts?*

In the following sub-sections we describe the different stages of the search and mapping exercise.

2.1.1. Defining relevant studies: inclusion and exclusion criteria

The inclusion and exclusion criteria were developed as a crucial part of the protocol for this systematic review and were refined through a process of discussion with three referees, including an information specialist. The inclusion and exclusion criteria that established the limits of the mapping exercise are presented in Boxes 2.1. and 2.2.

The first inclusion criteria requires some explanation. First, as discussed in Chapter 1, theory and previous empirical research suggest that there are a variety of channels through which variation in the effectiveness or efficiency of contract enforcement may affect investment in productive assets. At the same time, some specialised literatures have expanded rapidly, focusing on the links from institutions (including contract enforcement) to what, for our purposes, are intermediate outcomes. Most clearly, there is an extensive literature on institutions and *finance* (see La Porta et al. 1997, 1998; Beck and Levine, 2005). While extremely relevant from a broader policy perspective, typical contributions to such literature fall outside the scope of our review. These studies stop short of establishing the finance-to-investment link (that is, the causal pathways from financial markets, structures, and financial development, to fixed capital accumulation) that *cannot* be taken for granted (Harber and Perotti, 2008).

Second, and somewhat symmetrically, the literature on institutions and growth has often tested empirically the hypothesis that effects of the former occur through their impact on investment (see Figure 1.2). When testing the institutions-growth link, it is often just a few practical steps away to develop a more elegant argument by testing the institutions-investment-growth sub-hypothesis. That is why we explicitly make reference to the growth-focused studies as a source of relevant evidence for our review (provided they actually test the enforcement-investment connection).

Third, as can be seen, we threw a broad net regarding research designs. This was based on our previous assessments and expectation that the bulk of the evidence for our review was going to come from non-experimental designs, often based in secondary, observational data (we discussed in Section 1.3 why experimental designs can be expected to be the exception rather than the rule in connection to our review question). Thus, while inconclusive about causality (with some noticeable exceptions), the evidence we expected to gather was going to come from studies that intended to answer an 'impact' question (i.e. we value *intent* under design and data constraints). Correlation findings may not prove causality but they are nonetheless informative about the plausibility of causal hypotheses. We believe that making judicious use of these studies, which are the evidence available for an important policy question, is the best that knowledge users can do while the research communities develop new and better empirical strategies for causal inference in this

field. Our approach in this regard is not different from the one adopted in other areas of economic and social policy analysis, as exemplified by Tripney et al. (2009).

Box 2.1: Inclusion criteria

1. **Study design**: We will include studies that address empirically the causal links between quality of contract enforcement and levels of investment. A complete causal chain (i.e. going from empirical indication of changes in enforceability to variation in investment) must be empirically assessed in the study for it to be included. This includes both studies that enable some attribution of impact (those based on experimental and quasi-experimental methods, such as natural experiments using instrumental variables and other methods to control for potential endogeneity) and others that can only detect correlation (such as cross-sectional ordinary least squares and methods which do not attempt to control for potential endogeneity).
2. **Intervention**: Variations in effectiveness of contract enforcement. Contracts included are those (i) among private parties (including labour contracts) and (ii) between private parties and government agencies or branches.
3. **Outcomes**: Studies must assess effects on investment rate variables such as investment to GDP ratio, or Research and Development (R&D) expenditures. We will also synthesise information on intermediate outcomes where these are reported. Studies will consider investments affecting (i) gross capital formation, and (ii) 'green field' foreign direct investment (FDI) or capital accumulation by foreign subsidiaries (as opposed to mergers and acquisitions).
4. **Population**: Whole world. The units of analysis can be individual investors, individual firms, industries, regions or countries.
5. Other inclusion criteria:
    - 5.1. **Accessibility**: There is sufficient information available to allow screening, or it is possible to retrieve the full text.
    - 5.2. **Languages**: English, Spanish, French or Portuguese (provided studies are abstracted in the indexed databases and key websites).
    - 5.3. **Publication date**: between 1990 and 2010 inclusive.
    - 5.4. **Temporal coverage**: studies must document changes in enforcement (and investment) that occurred in the 20th-21st centuries.

The temporal restriction for our review (inclusion criterion 5.3: studies published between 1990 and 2010 inclusive) has two justifications. First, it is justified on practical grounds of feasibility given resources, database coverage, etc. Second, 1990 marks the publication of one of the seminal contributions to the field (North, 1990), which did much to spur the growth of the relevant empirical literature.

The policy-driven focus of our review explains inclusion criterion 5.4, as historical studies of contract enforcement in pre-20th century times may be of little use for drawing policy lessons for today, and their inclusion would have as an opportunity cost the time not spent in investigating and synthesising more directly relevant literature. Other inclusion criteria are justified on practical grounds or standard practice in systematic reviews (inclusion criteria 5.1 and 5.2), or on the basis of conceptual considerations exposed in Section 1 (inclusion criteria 2 to 4).

Box 2.2: Exclusion criteria

1. General studies of quality of institutions and growth, if it is not possible to discern the marginal effects of enforceability on investment, e.g. institutions variables do not distinguish the quality of contract enforcement and/or investment is not assumed to be at least partly explained by it (or the assumption is not tested with empirical evidence).
2. Studies focused on the enforcement of general economic rules and studies focusing on regulations (unless the effect of regulation on 'voluntary contract' enforcement, and of this on investment, can be discerned empirically).
3. FDI focused exclusively on mergers and acquisitions (M&A) or when the latter and net addition to capital stock cannot be disentangled.
4. Studies which estimate impacts on intermediate outcomes in the causal chain, but which do not estimate impacts on investment rates.
5. Full text not available/accessible.
6. Language other than English, Spanish, French or Portuguese.
7. Published before 1990.
8. Historical studies of pre-20th century institutions and investment.

2.1.2. Identification of potential studies: search strategy

The following databases were comprehensively searched, applying the date parameters and other search criteria discussed below:

- Econlit
- RePEc (Research Papers in Economics; www.repec.org)
- Scopus
- JSTOR
- Citeulike (www.citeulike.org)
- Academic Search Complete.

Accessibility constraints determined by our institutional subscriptions prevented us from having full-text access to Reuter's Web of Science, which includes the widely used Social Science Citation Index. We note, however, that there is evidence of significant overlap among some of the leading scientific databases, and that Web of Science is far from being the most comprehensive for the social sciences and humanities (Hicks and Wang, 2011). Our own experience shows that, starting from EconLit and Scopus and expanding to other databases revealed diminishing returns: the first two databases identified 12 of the final 22 studies, and the additions to EconLit and Scopus produced a very high number of duplicates. We started but later abandoned the search of databases of theses, as we had very limited and widely uneven access to full texts from our institutional subscriptions.

We made extensive use of Google Scholar, and its automatic integration with the professional databases available in our institutional subscription, for tracking citations back or forward, as well as for following various leads from the early unsystematic review that informed the proposal and the development of the protocol. Overall, the snowballing search process led to the identification of an

additional 317 non-duplicated potential relevant studies (12 percent of the total studies screened), and 8 (35 percent) of the final 22 studies included in this systematic review.

Overall, given the results of previous search tactics and the observed prevalence of institutional grey literature, we considered the coverage of institutional websites to be already quite comprehensive, so we did not perform hand searches of World Bank or other international organisations' sites. We scanned titles and checked abstracts for 200 of the most recent entries (as of 1 March 2011) in the New Institutional Economics e-library of the Social Sciences Research Network (SSRN), which yielded no new relevant items.[8]

Searches started with broad parameters derived from our research question and inclusion/exclusion criteria, and were developed with the advice of our team's information specialist. These searches were gradually narrowed with guidance from three external reviewers contacted by the DFID, including one information specialist. All searches were stored to ensure replicability. The search terms are presented in Appendix 1.2.[9] The EPPI-Reviewer software was used to record searches, manage references, generate reports, record decisions, analyse data and report results.[10]

2.1.3. Screening studies: applying inclusion and exclusion criteria

Initially, studies were screened using predefined inclusion and exclusion criteria (see Boxes 2.1 and 2.2). Two reviewers applied the criteria independently, first to titles and abstracts only, for all items identified by the database searches. Studies were then (i) excluded, (ii) included, or (iii) marked as 'pending' if the reviewer was unsure about their inclusion. The two independent reviews were compared and contradictory judgements or 'pendings' were discussed and resolved (when no agreement was reached, a third reviewer was asked to provide his opinion to resolve the disagreement). All the 'included' items were then moved to the full-text review phase.

Once full texts were retrieved, the reviewers applied inclusion and exclusion criteria, based on assessments of the full texts. Dubious cases were reviewed by two reviewers and discussions were held until consensus was reached. A record was kept in EPPI-Reviewer of all decisions.

2.1.4. Characterising included studies

Once the review team was satisfied that the search and identification were not yielding significant new additions, the reviewers filled out the descriptive portion of the coding and appraisal forms.

The coding tool, consisting of a series of questions and a checklist (see Appendix 3), was developed borrowing inspiration from various sources: an unpublished document recommended by one of the reviewers of the protocol (Dickson, personal

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[8]The Social Sciences Research Network 'New Institutional Economics' e-library and abstracting journal is sponsored by ISNIE, the International Society for New Institutional Economics. It covers research published in various formats (including working papers and conference papers) and from a wide range of sources, on 'organisation and boundaries of the firm, the structure and performance of contractual arrangements, the determinants and effects of property rights and transaction costs on resource allocation and governance institutions, the causes and effects of government regulatory and competition policies, the structure and effects of legal, social and political institutions on economic performance, the role and response of organisations to innovation and technological change, the role of beliefs and history in determining contemporary institutions, the determinants and outcomes of institutional change, and the role of institutions in economic development and transition'.

[9]The parameters of the first search consisted of type 1 and type 2 keywords combined with AND. The databases were searched for the period January 1990 – December 2010.

[10]Since EPPI-Reviewer was in development during our review process, and there were periods when its functionalities became unstable or unreliable (e.g., duplicates handling), we occasionally used other substitute tools, to avoid wasting critical time before deadlines. We have produced a single database, comprising search, screening and results of full text review, and another one for the coding of included studies. Both are available on request.

communication), the EPPI-Centre Data Extraction and Coding Tool for Education Studies v2 ('Coding Studies and Extracting Data for a Review', EPPI-Centre, 2007); Noyes and Lewin, 2011; and Spencer et al. (2003).

We used the information extracted using the coding and appraisal form to describe the population of studies, and for the synthesis. In Chapter 3, we provide some general statistics for included studies.

2.1.5. Identifying and describing studies: quality assurance process

The following mechanisms were part of the quality assurance methods:

- The search strategy was controlled by reviewers and information specialists
- The screening (title/abstract) was conducted by more than one reviewer for each reference found
- Double-screening of dubious cases (based on full text) was undertaken, and disagreements were discussed and resolved by the review team.

2.2. In-depth review

This section describes the methodology used to synthesise the information contained in the studies identified at the mapping stage. In particular, we describe the methods used to describe the studies, to assess their quality, to aggregate and synthesise findings, and to draw conclusions and implications.

2.2.1. Detailed description of studies in the synthesis

For the group of studies attempting to answer the 'impact' question through quantitative analysis of observational data, we tabulate and examine the following information:

1. Information on the study setting (sample), main characteristics of the indicator used to measure the independent variable (or 'intervention'), the structure of the data and study methods, the units of analysis (countries, subnational jurisdictions, firms, etc.), the outcome variable and the study findings (narrative summary of findings).
2. Results of the critical appraisal for each study, and in particular, ratings for scales such as Weight of Evidence and Capacity to Deliver Causal Inference (see below).

We present the authors' interpretation of their study results. Typically, results are reported as regression coefficients: these figures are summarised in tables in Chapter 4 and in Appendix 5, with the reported standard errors. The varied definitions of the relevant dependent variables (e.g. monetary values vs rate of variation vs shares of investment over capital stock or GDP), and heterogeneity of research designs complicate greatly the computation of standardised measures of 'effects' as in meta-analysis. However, we can present and examine (a) the direction of effects and (b) the reported statistical significance of the estimates; in some cases we also discuss broadly (c) the quantitative importance of estimated effect.

Vote counting of studies is used to describe the findings, but not much weight is placed in overall results. Instead, results of vote counting are qualified taking into account the critical appraisal of the studies and the heterogeneity of the research designs. We use a Weight of Evidence rating, and a Capacity to Deliver Causal Inference indicator, to summarise the reviewers' quality assessment and to qualify the straightforward vote-counting results.

2.2.2. Assessing the quality of studies and weight of evidence for the review question

The review question is about 'impact', but it refers to a field where controlled experiments (and even suitable control groups for ex-post analyses) are very hard to come by and most frequently unavailable. This poses a challenge for the assessment of research quality. We tackle that challenge with a set of tools and strategies, rather than relying on a single measure, but before we describe them we summarise two key reasons why controlled or 'natural' experiments are rare:

1. Real-world institutional reforms typically take a long time to be implemented and tackle several objectives at once. Due to the nature of the policies involved, reformers will be reluctant to unbundle a reform package for the purpose of making its impact easier to evaluate. Generally, one cannot expect to find a reform ('intervention') that swiftly removes a single hurdle, enhancing the quality of contract enforcement and leaving everything else unchanged.
2. There is a principle of equality of citizens before the law that is associated (substantially or rhetorically) with many of the institutional reforms of interest. That would make it politically unpalatable to implement a reform that enhances contract enforcement for a randomly sampled group of citizens and not for others. Moreover, the rule of law has some 'public good' features because the ruler does not know who the parties to a dispute will be, and it is hard or impossible to exclude some citizens or firms from the effects of relevant institutional innovations.

Variation in the quality of contract enforcement will therefore come from comparing observational data across whole jurisdictions and time, or focusing instead not on the effects of broader institutional environments but on whether individual agents have been differently exposed to it (which is not a perfect substitute for the former). We will see below examples of how the literature has dealt with these difficulties, and the stronger and weaker responses to these problems.

Given these specificities of the field, rather than assessing research quality from its (narrowly defined) capacity to answer the *impact* question (that is, whether the results come from controlled experiments, or at least natural 'quasi' experiments), we use a set of indicators to reflect the team's assessments of 'weight' of the evidence, and of the studies' persuasiveness about proposed causal mechanisms. We describe those tools immediately below. In all cases, the coding was done by two reviewers independently, and disagreements were resolved by bringing the third reviewer in, and working on the disagreement until consensus or (rarely) a majority was reached.

Weight of evidence scales

Following Gough (2007) and the example of the application in Tripney et al. (2009), we rate the studies with a 'weight of evidence' (WoE) instrument that draws on data extracted at the coding stage. Our coding tool contained 17 questions that, individually and in combinations depict a study's reliability in providing answers to the review question. The WoE tool consists of four items constructed as follows:

WoE A: Aims to reflect quality of study execution. It results from counting the number of items getting a 'positive' rating from the responses in items 3.1 to 3.7 and 3.9 to 3.14 of the coding tool.[11] Studies were then coded as:

> High = met almost all the desirable criteria specified in the mentioned items ('positive' ratings in 12 or 13 items).

[11]We dropped information from item 3.8 (about stakeholders' involvement in the study) because the large majority of studies did not provide meaningful information to rate it.

Medium = met some of the desirable criteria specified in the mentioned items ('positives' in 8 to 11 items).

Low = met only a few desirable criteria ('positives' in seven or less items).

WoE B: Focuses on the research design, and takes the 'conventional' approach to causal inference and bias avoidance. We keep the original definition of the tool, even when it is too demanding for our field of study, but complement it with other assessments, as seen below. Studied are thus coded with this scale:

High = if the design is a randomised controlled trial.

Medium = non-randomly allocated prospective evaluations.

Low = all other study designs.

WoE C: aims to reflect whether the *focus of the study* is adequate for addressing the systematic review question. It considers conceptual focus, context, sample, measures of contract enforcement and investment, and other indicators of the study focus. Ratings are then assigned according to the following definitions:

High = the analysis of the link between enforcement and investment is the main objective or one of the main study objectives, and other good characteristics are present (e.g. good proxies for contract enforcement and investment).

Medium = the analysis of the link between enforcement and investment is one of the main study objectives and other characteristics defining the focus are adequate.

Low = the analysis of the link between enforcement and investment is NOT one of the main study objectives or other characteristics defining the focus are very poor.

WoE D: Overall weight of evidence: is defined as the average of A, B and C, with the condition that WoE D cannot be higher than the average of A and B.

Capacity to deliver causal inference (CI)

Taking into account the limitations of WoE B in discriminating among 'lower quality' methods for testing causality ('impact') hypotheses, we use in our synthesis a third appraisal instrument, intended to reflect whether the studies come close to demonstrating causality. This responds to the specific constraints on research designs characterising the field and research question. It aims to introduce space for more nuanced appraisals than those that would result from a more strict understanding of admissible research designs for impact questions.

To reflect this assessment, the reviewers took into account the following aspects of each study:

- Intent and narrative: whether the study attempts to build a causal narrative providing supporting evidence or building on previous research, to justify auxiliary assumptions, complement statistical analyses etc.
- sample size, design and appropriateness of statistical analysis.
- discussion/consideration of omitted variables and confounding factors, referring to the most accepted or plausible theories; inclusion of sensitivity analyses, etc.
- treatment of endogeneity/exogeneity issues. Techniques such as instrumental variables estimations, two or three stage ordinary least squares, simultaneous testing of systematic policy reaction functions, Granger-exogeneity tests in time series, some Bayesian techniques etc., are strategies of empirical analysis for non-experimental data that overcome some limitations of the basic regression

approach for CI. When instrumental variables are used, it also becomes relevant to judge the adequacy of instruments.

A global rating was given to each study, which responds to question 3.16 of the coding tool ('Can the study deliver inferences about the mechanisms at work in the review question'; the team agreed to interpret 'mechanisms' as 'causal mechanisms'), and the answer was coded at three levels (Yes = 3; Yes, some = 2, or No = 1).

The studies were rated by the reviewers. Doubts and disagreements were discussed and resolved by the team.

2.2.3. Synthesis: quality assurance process

Each reviewer was assigned a subset of the primary studies, ensuring that all the substantive portions of the coding tool (sections 2 to 4) were double-reviewed. In case of disagreement, discussions were held bilaterally or the third reviewer was brought in, until consensus (or majority) was reached.

2.2.4. Synthesis of evidence

We basically follow a 'vote-counting' approach, but attempt to avoid some of its known shortcomings (Petticrew and Roberts, 2006) by exploring whether variations of 'qualified voting' yield different conclusions. In particular, we discuss how 'vote counts' among 'high quality' studies differ from those in the whole population or among lower quality studies. Besides (i) study quality, we examine variations in patterns of results that might emerge related to (ii) study methods, (iii) sample or context characteristics, and (iv) specific characteristics of the independent variable/indicator.

Besides synthesising the findings regarding the direction and size of effects (of contract enforcement on investment), we examined the studies seeking to identify the causal mechanisms highlighted by the authors and alternative plausible interpretations, and whether they interacted with context to explain outcomes.

As mentioned before, the small number of relevant studies, and the heterogeneity in study designs, 'treatments' and 'outcomes', raised questions about the soundness of performing meta-analysis on the identified primary studies (Petticrew and Roberts, 2006; pp. 192-208).

3. Identifying and describing studies: results

3.1. Overview

This section describes the results of the systematic mapping; that is, the numerical results of successive screening and appraisal, and some basic characteristics of the included primary sources.

3.2. Identifying studies

Initially, the inclusion-exclusion criteria were applied to the results of the searches (2229 non-duplicated studies) based on titles and abstracts only. These included 'confirmations'; that is, studies that had been identified earlier, in the preparatory stages of this project, that were also picked up by the database searches. All titles and abstracts were double screened by two different reviewers. Studies were classified by each reviewer as (i) excluded, (ii) included, or (iii) 'pending' if the reviewer was unsure about their inclusion.

There were 263 disagreements among reviewers. After arbitrating differences, based on abstract and title screening, 114 studies were classified as included for full-text screening and the other 2,115 were excluded. Most of the studies excluded in this phase did not meet inclusion criterion 1, i.e. they were not relevant for answering the review question. This includes several studies that either studied institutional determinants of investment but not contract enforcement, or examined effects of contract enforcement but not its effects on investment.

From the 114 studies retrieved for full-text screening, 96 were excluded and 18 were retained for further analysis. The dubious cases were double screened by a second reviewer and an agreement was reached with the initial reviewer.

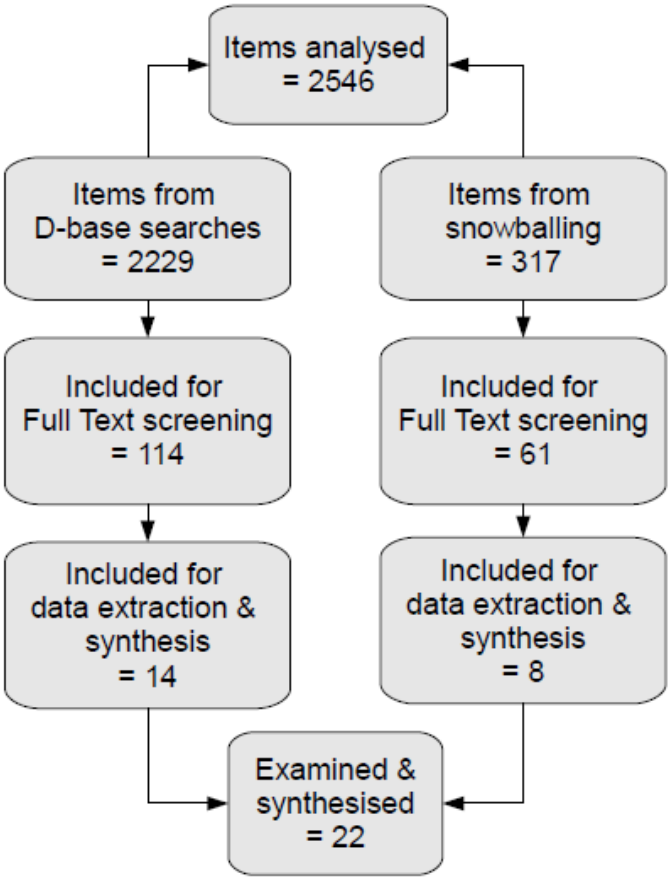
From these eighteen papers, three were surveys of the literature and were used only as a source of additional bibliographical references, and one was a qualitative analysis[12] that fell in a class of its own (we had intended to create a special category for this type of empirical studies but found only one that met the criteria). The other 14 were taken to the next step (the qualitative study is not counted in tables and summaries).

As mentioned in Chapter 2, we also performed backward and forward citation tracking ('snowballing'), based on previously included items as well as on key articles or book chapters, identified as such through personal knowledge. This process led to an additional 317 non-duplicated and potentially relevant papers. Sixty-one papers passed the abstract screening process and were full-text double screened. Eight additional papers were classified as included after this stage. It is interesting to note that the inclusion rate was in this case 2.5 percent (8/317), which is much higher than the inclusion rate from the more mechanical search strategy based on bibliographic data bases (0.7 percent or 15/2,229). This is in line with the results observed by Greenhalgh and Peacock (2005), who note that the majority of primary sources in systematic reviews tend to come from 'snowballing' and an important proportion from 'personal knowledge'.

Figure 3.1 summarises these processes. Appendix 2 provides examples of exclusion decisions, to further clarify how the selection criteria were applied.

[12]Gow et al. (2000).

Figure 3.1: Item search and screening



3.3. Basic characteristics of identified studies

From the systematic search and screening, 22 primary sources were identified that met the eligibility criteria. These include two sets of items that contained different versions of almost identical analyses: they are Alfranca and Huffman (2001, 2003), and the group made up of Gow and Swinnen (2002), Cungu and Swinnen (2003), and Cungu, Gow, Swinnen and Vranken (2008). To avoid giving excessive weight to studies that have more than one report with slight variations, we 'represent' the first pair with the most recent (Alfranca and Huffman, 2003), and the second group is represented by what we considered to be 'the best' report (Cungu and Swinnen, 2003). This brings the total number of 'synthesised items' to 19.

The analysed studies are published as refereed journals (13) and working papers or conference papers (6). All but one are available in English (the one in Spanish was captured by the searches because the indexed publication includes an abstract in English) (Table A.3.1 in Appendix 4).

While the majority of studies focus specifically on contract enforcement (15 studies), or on the broader concept of institutions and investment (11), some evidence valuable to answer the research question comes (and will come) from studies that have slightly different foci (Table A.3.2 in Appendix 4).

Cross-country evidence seems to dominate the relevant body of research. This is reflected in the geographic scope of the studies as well as the unit of analysis (Table A.3.3 in Appendix 4).

The prevailing type of data are cross-section and panel (Table A.3.4 in Appendix 4). One study (Clague et al. 1999) also uses narratives of seven country stories (cases) to support its claims. Discussion of estimation methods is presented in Section 4.2.

We found five cases of 'specialised' types of investment in the 19 analysed studies: three on R&D investment, one on infrastructure and one on inventories of raw materials and finished goods (Table A.3.5 in Appendix 4). Our selected studies show a variety of approaches to measurement or classification of variation in the quality of contract enforcement, which is characteristic of the broader literature on institutions and economic development (Table A.3.6 in Appendix 4).

4. In-depth review: results

4.1. Overview

We combine here the results from individual studies to produce an overall result for answering the review question. We start with a general description of the 'included' primary studies (those that met all our eligibility conditions). In Section 4.3, we classify the studies based on two indicators of 'research quality' reflecting various dimensions of quality. In Section 4.4 we synthesise the evidence, first focusing on the findings of the strongest studies (according to our quality appraisal tools), and then looking into the whole set of studies for patterns of mechanisms, contexts and outcomes emerging from the search.

4.2. Studies included in the synthesis: aggregate features

As discussed above, the nature of the 'innovations' for which 'impact' is sought greatly influences the nature and quality of the evidence available, and therefore the inferences that can be made and the conclusions that can be drawn (as demonstrated by the results of the search and appraisal, researchers can be more or less purposeful and successful in addressing some of the shortcomings of the data and/or in looking for and exploiting 'natural experiments', so the overall shape of the research field is influenced but not fully determined by the nature of the review question).

In general, the studies synthesised are all statistical analyses of non-experimental data, and the group is mainly composed of study designs that cannot be conclusive regarding causality. We found one item (Chemin, 2006) that cleverly takes advantage of an actual legal reform (the 2002 enactment of the Code of Civil Procedure Amendment Act in India) to construct 'treatment' and 'control' groups retrospectively. The systematic review also yielded four studies that make judicious use of cross-country variations in institutions (and in the determinants of institutions) to illuminate possible causal pathways, displaying other desirable features of good practice in the statistical/econometric analysis of observational data.

Studies also vary in terms of the units of analysis, thus making it harder to draw robust conclusions applicable with confidence to some of the relevant levels of possible intervention. Thirteen out of the 19 synthesised studies have 'countries' as the unit of analysis, and five investigate data at firm level. One study uses variations among industries. This echoes the concerns of authors like Pande and Udry (2005) that too much emphasis has been placed by the 'institutionalist' approach in analysing cross-country differences, to the detriment of other sources of institutional variation that remain under-studied. Moreover, 'insights' on institutions and performance deduced from observed cross-country variations may be vulnerable to the 'ecological fallacy', so their translation into policy cannot be mechanical.[13]

The clustering of and patterns of interconnection among the selected studies can be seen from various angles. The quantitative studies include three analyses (by overlapping groups of co-authors) of the same firm-level survey (items 11, 12 and 14; for item numbers, see Section 6.1), and members of this very same team are the authors of the single qualitative case study that met the eligibility criteria. These studies measure breaches of contracts (in the form of delayed payments in contracts between farmers and food processor companies) based on firm managers' subjective

[13]The 'ecological fallacy' consists of generalising about individuals what has actually been observed at some higher level of aggregation (e.g., geographic units).

rating of the 'seriousness' of certain events as obstacles to the growth of the business. On the other hand, at least one of the three (number 12) is among those that offers a careful discussion and empirical test of an indirect causal pathways from the quality of enforcement to the investment outcomes.[14]

A separate set of three studies use the same 'constructed' measure of quality of contract enforcement, including the early proponent of the indicator (study 8, which informed the work of 15 and 21). These studies measure quality of enforcement indirectly through the concept of 'contract-intensive money' (that is, the ratio of non-currency money to the total money supply), arguing that 'the same governmental deficiencies that require self-enforcement of transactions also lead economic actors to prefer currency' (Clague et al. 1999, p. 188). While many of the studies raise issues of validity of indicators, this is perhaps the measure of contract enforcement that requires stronger 'assumptions' to be regarded as a valid empirical proxy of the phenomena of interest.

The vast majority (15 of the 19 studies) use ratings or reports of the quality of enforcement or rule of law based in some way on the views of experts and/or businessmen (which may be based on their direct experience or a broader expert analysis of country conditions). These include studies exploiting data generated by various World Bank-led initiatives on the business environment, as well as those exploiting secondary data generated since the 1970s by investor advisory companies such as ICRG (International Country Risk Guide) or BERI (Business Environment Risk Assessment), and the Heritage Foundation (on the strengths and limitations of these indicators, see Knack and Keefer, 1995; Williams and Siddique, 2008). By contrast, Chemin (2006), our study number 7, generates intervention and control groups by considering the 'innovation' introduced by a national law amendment that included a varying number of measures enacted many years earlier by some of India's states.

Perhaps less problematically, the studies also vary in terms of the measure of investment used. Twelve studies measure investment as the rate of a period's flow over GDP (Gross Domestic Product) (1, 2, 6, 8, 10, 13, 15, 20, 21) or over the stock of capital (12 and 18) or its growth (16). One study measures the level of investment in infrastructure (5). Three studies focus on the effects of contract enforcement on the investment in R&D: studies 4, 9 and 17). Three studies use other indicators: number 7 examines investment as binomial choices over a range of productive assets, 19 examines value-added elasticities of investment across industries, and 22 looks at levels of inventories of finished products.

The choice of measures is not unrelated to the choice of unit of analysis and methods. Notably, all included studies considered domestic investment of some kind as their outcome variable, and none focused on foreign investment (study 5 is ambiguous and could include foreign funds). In the systematic search, screening and inclusion decisions, we excluded many studies focusing on FDI flows, since they do not distinguish between 'greenfield' investment or net additions to capital stocks, and divestitures and acquisitions of existing assets.

Generally, the synthesised group of studies exhibits a high proportion of cross-section analyses. While one would expect that answering an 'impact' question would draw attention to longitudinal (time series) or panel data structures, a majority of the studies – and notably some of those that rate highest in terms of our quality appraisal scales – are based on cross-section analyses (although with creative and careful identification of variables and lag structures, indicators and instruments). There is no

[14]To avoid over-representing a study with various publications, these three studies are 'represented' by item number 12; for the same reason, publication 4 also 'represents' number 3 from the same study.

straightforward correlation between form of quantitative analysis and the basic unit of analysis.

Table 4.1 presents the identified relevant items organised according to unit of analysis, structure of the datasets and estimation methods. The small number of studies that are able or willing to investigate longitudinal data could anticipate that the literature would be constrained in testing causal hypotheses, if joint dynamics and appropriately structured lagged variables are of assistance in that quest. As argued by some authors (e.g. Rodrik, 2005), the type of test of 'institution-performance' hypotheses that even cross-country panels can support are plagued with endogeneity issues. Controlled trials (as seen before, not an option in this field), studies of natural experiments or instrumental variables estimations are some of the strategies available to address concerns about bias and to get close to sensible inferences about causes and effects. Not surprisingly, our best quality studies (see next section; highlighted in grey in Table 4.1) resort to the latter two strategies, but several others fail to consider those issues and proceed with estimation methods that cannot sustain a causal attribution.

Table 4.1: Studies by unit of analysis, structure of data and estimation method

	Unit of analysis					
Structure of data set - as used	**Countries**			**Firms or industries**		
	Study	**Estimation method**	**Effect**	**Study**	**Estimation method**	**Effect**
Cross section	Acemoglu and Johnson (2005)	Instrumental variables (2SLS)	NS	Cungu and Swinnen (2003)	Tobit model	+ (ind) NS(dir)
	Brunetti et al. (1998)	OLS	+	Raja and Schaefer (2007)	OLS	+
	Clague et al. (1999)	OLS, GLS	+	Long 2010	OLS	+
	Commander and Tinn (2008)	OLS	(-)/NS	Lin et al. (2010)	Probit and Tobit. Inst. Var.	+
	Dao (2008)	OLS	+	Pang and Wu (2009)	OLS, Inst. Variables	+
	Levine (1998)	GMM, Instrumental variables	+ (ind)			
Pooled cross sections	Banerjee et al. (2006)	Pooled OLS	NS	Chemin (2006)	Diff-in-diff approach	+
Time series	Prados and Sanz-Villaroy (2009)	Seemingly unrelated regression	+			
Panel	Acevedo and Mora Mora (2009)	Fixed and random effects panels; dynamic panel	+			
	Alfranca and Huffman (2003)	Seemingly unrelated regression	+ (I)			
	Clarke (2001)	Fixed effects	+			
	Le (2004)	Feasible GLS	+			

	Poirson (1998)	Fixed and random effects panels	NS	

Notes: 'Greyed' items are highest quality (see Section 4.3); (-)/NS: two regressions yield NS coefficients, one yields a significant negative; +(ind) : estimated relationship is positive but indirect (through another intermediate outcome); +(I) positive effect shows up only when contract enforcement is allowed to interact with variable for efficiency of bureaucracy; (ind)=indirect effect; (dir)=direct effect.

4.3. Results from critical appraisal

As discussed above, we use two indicators (one of them summarising several dimensions) to rate the quality of the evidence and analysis, and make it possible to produce quality-adjusted syntheses.

The WoE judgements for all the studies that reached the synthesis stage are shown in Table 4.2., sorted (from highest to lowest) by the summary 'dimension D', and then the generic, quality of execution, 'dimension A'.

Table 4.2: Weight of evidence ratings

	Report	WoE A	WoE B	WoE C	WoE D
7	Chemin (2006)	High	Medium	High	High/med
1	Acemoglu and Johnson (2005)	High	Low	High	Medium
19	Pang and Wu (2009)	High	Low	Medium	Medium
4	Alfranca and Huffman (2003)	Medium	Low	High	Med/low
8	Clague et al. (1999)	Medium	Low	High	Med/low
12	Cungu and Swinnen (2003)	Medium	Low	High	Med/low
17	Lin et al. (2010)	Medium	Low	High	Med/low
22	Raja and Schaefer (2007)	Medium	Low	High	Med/low
6	Brunetti et al. (1998)	Medium	Low	Medium	Med/low
16	Levine (1998)	Medium	Low	Medium	Med/low
18	Long (2010)	Medium	Low	Medium	Med/low
10	Commander and Tinn (2008)	Medium	Low	Low	Med/low
20	Poirson (1998)	Medium	Low	Low	Med/low
2	Acevedo and Mora Mora (2009)	Low	Low	High	Low
9	Clarke (2001)	Low	Low	High	Low
13	Dao (2008)	Low	Low	High	Low
15	Le (2004)	Low	Low	High	Low
21	Prados and Sanz-Villarroy (2009)	Low	Low	High	Low
5	Banerjee et al. (2006)	Low	Low	Medium	Low

Some aspects of the resulting ratings are worth discussing. First, the second dimension of the WoE rating ('dimension B'), as applied here, reflects strictly the suitability of methods used in the studies for answering an 'impact' question. There is no doubt that our review question is an impact one. We start here by following standard practice and reserving a 'high' rating to studies based on randomised controlled experiments, of which there were none in our 19 included studies. The 'medium' rating is generally reserved for 'non-randomly allocated prospective evaluations'. We took here a slightly different approach and rated as 'medium' the only study that effectively and convincingly identifies 'intervention' and 'control' groups based on ex-post data (with pre and post-reform observations). All other designs are rated 'low' in this dimension. The overall effect of this criteria on the summary 'dimension D' is to lower overall ratings. This happens not only because we generally rate poorly one of three dimensions that are then aggregated, but also because the 'summary' method adopted is 'average (dimensions) A, B and C, with the restriction that WoE D cannot be higher than the average of A and B' (see Section 2.2.2). In other words, the lack of experimental data/designs leads us to lower the WoE ratings generally.

We can observe in Table 4.2. that, based on the WoE overall ratings, there are 6 (of 19) studies that should probably be discarded in trying to extract evidence that at least sheds light on the plausibility of certain analytical hypotheses (those with low WoE D), and a further ten would have to be taken with care (those with medium/low WoE D). It is also interesting to note that the problems detected with the quality of execution are not for studies having the contract enforcement and investment link as a secondary goal, but for also for many studies (five out of the six of 'low' quality) that have our review question as one of their focuses. The same applies to the second to last group of ten studies rated medium/low overall, which includes five that rate 'high' in the 'relevance and focus' dimension C of the WoE tool.

In rating dimension A, we found that some of the more frequent problems lowering the quality assessments were the appearance of publication bias (i.e. reporting only a few results that confirm the authors' stated hypotheses), failing to undertake or report sensitivity/robustness analyses, lack of discussion of possible endogeneity issues, insufficient or inadequate discussion of the validity of indicators (particularly, but not only, the indicators for change in the effectiveness of contract enforcement), or generally poor reporting.

Regarding the studies' capacity to sustain causal inferences, the CI indicator yields the distribution shown in Table 4.3.

Table 4.3: Capacity to deliver causal inferences

	Report	**CI**
1	Acemoglu and Johnson (2005)	3
7	Chemin (2006)	3
8	Clague et al. (1999)	3
16	Levine (1998)	3
17	Lin et al. (2010)	3
19	Pang and Wu (2009)	3
4	Alfranca and Huffman (2003)	2
12	Cungu and Swinnen (2003)	2
18	Long (2010)	2

	Report	CI
22	Raja and Schaefer (2007)	2
2	Acevedo and Mora Mora (2009)	1
6	Brunetti et al. (1998)	1
9	Clarke (2001)	1
5	Banerjee et al. (2006)	1
10	Commander and Tinn (2008)	1
13	Dao (2008)	1
15	Le (2004)	1
20	Poirson (1998)	1
21	Prados and Sanz-Villarroy (2009)	1

As can be seen, an approach to assessing CI that is adapted to the specificities of our particular field is able to discriminate among studies that otherwise are all similarly classified in the bottom rating of WoE B. This can be seen more clearly in Table 4.4.

Table 4.4: WoE and CI rating presented together

	Report	WoE A	WoE B	WoE C	WoE D	CI
7	Chemin (2006)	High	Medium	High	High/med	3
1	Acemoglu and Johnson (2005)	High	Low	High	Medium	3
19	Pang and Wu (2009)	High	Low	Medium	Medium	3
8	Clague et al. (1999)	Medium	Low	High	Med/low	3
16	Levine (1998)	Medium	Low	Medium	Med/low	3
17	Lin et al. (2010)	Medium	Low	High	Med/low	3
4	Alfranca and Huffman (2003)	Medium	Low	High	Med/low	2
12	Cungu and Swinnen (2003)	Medium	Low	High	Med/low	2
22	Raja and Schaefer (2007)	Medium	Low	High	Med/low	2
18	Long (2010)	Medium	Low	Medium	Med/low	2
6	Brunetti et al. (1998)	Medium	Low	Medium	Med/low	1
10	Commander and Tinn (2008)	Medium	Low	Low	Med/low	1
20	Poirson (1998)	Medium	Low	Low	Med/low	1

	Report	WoE A	WoE B	WoE C	WoE D	CI
2	Acevedo and Mora Mora (2009)	Low	Low	High	Low	1
9	Clarke (2001)	Low	Low	High	Low	1
13	Dao (2008)	Low	Low	High	Low	1
15	Le (2004)	Low	Low	High	Low	1
21	Prados and Sanz-Villarroy (2009)	Low	Low	High	Low	1
5	Banerjee et al. (2006)	Low	Low	Medium	Low	1

4.4. Synthesis of evidence

Our synthesis approach rests first on focusing on higher quality items, and looking at what new information is added by lower quality ones, but with due consideration of their relative weakness. At a second stage, we return to the full set of primary studies, aiming to find some pattern(s) in the mechanisms assumed by the authors to be behind the empirical evidence produced, the context of the studies and the outcomes observed. A synthesis summary can be found in Tables A.4.1.A-B in Appendix 4.

The initial focus of the synthesis is then on those studies that attained at least a 'med/low' rating in the summary dimension (D) of the WoE tool, and a rating of 2 or higher in the CI scale (i.e. 10 studies). However, we start by discussing more carefully the results of the studies that attained a rating of 3 in the CI scale (6 studies). Then, we examine whether there is any significant value added by the inclusion of information from those studies that have a rating of 2 in the CI scale *and* also a 'med/low' rating in WoE D (4 studies).

In general, as can be seen in Table 4.4, the two quality indicators used in this systematic review are strongly correlated. There are six studies that attained at least a 'med/low' rating in the summary dimension (D) of the WoE tool and also have a rating of 3 in the CI scale, meaning that the studies can deliver inferences about the mechanisms at work in the review question according to reviewers' judgement.

The strongest study in the review (Chemin, 2006; study number 7) examines India's experience around the 2002 enactment of the Code of Civil Procedure Amendment Act, to assess the net impact of the Act taking into account the fact that some states had already enacted some amendments in the (distant) past. This is the only study to examine a specific reform process; firm-level data, combined with subnational variation in legislation, and a nationwide reform allow the author to draw strong conclusions (based on a differences-in-differences approach) that are shared by the reviewers:

> a speedier judiciary decreases the probability to experience a breach of contract, increases the incentives to invest, decreases the probability to experience shortage of capital, favors access to formal … financial institutions and thickens rental markets. These results indicate that the quality of judiciaries across Indian states plays an important role in shaping economic activity (Chemin, 2006, p. 27).

Specifically, the study shows that the reform (the degree to which it changed legal processes at state and national levels) impacted positively on small firms' decisions to invest or not to invest in a variety of fixed productive assets. According to the

author, additional evidence shown supports the view that the decision to invest is favoured by other effects of a speedier judiciary: less breaches of contracts, greater access to credit and thicker rental markets. His results would count as a 'positive' for the effect of contract enforcement on investment, besides the additional light on co-determinants or causal chains.

The second strongest item is Acemoglu and Johnson (2005). These authors use a cross section of countries that were once European colonies, to unpack the concept of growth and investment-friendly institutions, distinguishing property rights from contracting institutions. They find evidence that variation in contracting institutions has an impact on the structure of financing, but does not seem to have a direct effect on investment rates. Their instrumental variables approach addresses endogeneity issues: they proxy some of the contemporary institutional variables by correlated but unequivocally preceding variates (e.g. English legal origin, settler mortality, population density circa 1500), controlling the possible reverse-causality bias. Their samples are sometimes very small (for example, in looking at the stability of findings for sub-samples). At the appropriate quality level, their results would count as a 'no effect' for the review question.

Pang and Wu (2009) is the third strong study to consider. It is rated 'medium' for relevance and focus because it does not have contract enforcement and investment as primary concerns. Rather than analysing the effects of institutions on the rate of investment, it looks at the effect on the allocation of capital to more or less efficient industries. It qualifies to be included in this review because it sheds light on the direct effect of contract enforcement on the rate of capital accumulation by industries. As the previous study discussed, it is generous in its testing for alternative specifications, discussing indicators and endogeneity, and using instrumental variables techniques to sidestep that trap. Like Acemoglu and Johnson (2005) it also takes advantage of the more recent 'objective' indicators of procedural complexity, and has a large sample of industries-countries-years. As with cross-country regressions, one has to be careful in extracting straightforward policy implications. That said, the study argues persuasively that better enforcement of contracts is associated positively with more efficient allocation of capital, understood as investment going to industries with greater growth potential (and measuring it by the elasticity of investment to value added). The authors also argue that the observed effect is more pronounced in industries which are more contract-intensive. For the purposes of our review, this study counts as a 'weak positive'. It illuminates a link from contract enforcement to the allocation of capital; though not specifically to the rate of investment, and to a responsiveness to growth that would reinforce the well-established 'accelerator' effect (that is, output growth's positive effect on investment).

Clague et al. (1999) are much more direct. Their approach is to create an indicator for effectiveness of contract enforcement based on the use by societies of 'contract-intensive money'. If the indicator is considered a valid proxy for the proxied concept, then it is possible to build even long-term series (see Prados and Sanz-Villarroy, 2009) and use time series approaches to measuring effects on rates of investment. However, they use time variations only for specific countries, to tell a set of stories (cases) that would lend support to the proposed indicator, linking sudden variations to recognizable historical events. When it comes to the statistical analysis, they transform longitudinal variations into averages or other measures, to run cross-country regressions. Their discussion of the indicator's correlation with other measures, of whether the indicator captures what it is asked to, and the inclusion of some sensitivity analyses, adds to the credibility of the story. Regarding the review question, they claim to find statistically significant evidence of a positive effect of

contract enforceability on investment ratios, so their results would count as a 'positive'.

Levine (1998) is another one that does not rate highly regarding focus and relevance, as it is mostly concerned with the effect of institutions on financial development and growth. A carefully crafted study, it digs deeper into the financial development-growth link than into the contract enforcement-investment one. Regarding the former, the study can be read as demonstrating that financial development matters for growth of the capital stock, and the latter is partly explained by enforcement of contracts (proxied by a composite index of rule of law and risk of confiscation). The study uses instrumental variables and a cross-section sample. His results would count as 'positive' for an indirect effect of contract enforcement on investment through financial development.

Finally, the last top-rated study (Lin et al., 2010) examines the effects of property rights protection on corporate R&D in a sample of 2400 firms of 18 Chinese cities. Given the potentially endogeneity of the quality of contract enforcement variables (indicator of firms' managers' faith that their rights will be protected by the contract and upheld by the legal system) the authors use the industry-location average of these variables as instruments. The evidence presented in the study shows that contract enforcement plays an important (positive) explanatory role both in the decision to invest in R&D and in the amount invested in R&D by firms; therefore this study counts as a 'positive'.

In brief, the six best-rated studies suggest that (i) contract enforcement might matter directly to investment, (ii) it probably matters also indirectly through development of financial markets, and (iii) it may augment the accelerator effect (of growth itself partly driving investment). More specifically, at least in one major developing country (India), there seems to be evidence that relevant enforcement deficits and improvements have to do with the speed of processes, which might create incentives to breach contracts and to hold up available funds from entering the circuit that leads to investment. That said, the heterogeneity of methods and findings, the ambiguities intrinsic to cross-country evidence, and the limited feasible treatment of endogeneity, would prevent an impartial reader from drawing strong conclusions.

When we add into the picture the studies rated 2 in CI (and 'med/low' in WoE) the heterogeneity is even greater than before (see Table A.4.2. in Appendix 5). A straightforward 'vote count' shows three of the additional four studies reaching a 'positive' result (for better contract enforcement being positively associated with higher investment), but one focuses only on R&D investments. The remaining study in the group finds a positive indirect effect of enforcement on investment, through less breaches of contract in the form of delayed payments. The contract enforcement indicator in this study is firm managers' perception of ineffective courts as a problem, through the same survey that generates the data on breach of contract (also a subjective rating).

In general, these studies cannot go beyond an observation about correlations between improvement in the enforcement proxy and the investment indicator. In fact, in some cases, there is the very credible possibility of reverse causality.[15] Additionally, most of these studies do not perform sensitivity checks.

Taking into consideration the CI ratings in Table 4.3 and 4.4, as an indicator of how good the study is in elucidating plausible causal pathways, we can see that the

[15]Brunetti et al. (1998) run a regression of the average investment rate in the period 1970-92 (alternatively 1980-92) on a measure of contract enforcement in the year 1996.

second tier of studies with a CI rating of 2 cannot generally deliver strong inferences about the causal mechanisms at work in the review question.

The 19 studies synthesised can be examined from the perspective of detecting the mechanisms they highlight as standing behind the empirical regularities. This analysis, of 'causal stories' supporting or justifying the empirical exercises, is valuable in itself with relative independence from the authors' willingness or ability to establish the causal link on the basis of evidence. This is why we include here all the studies selected for synthesis, without filtering them by 'quality' or other indicators.

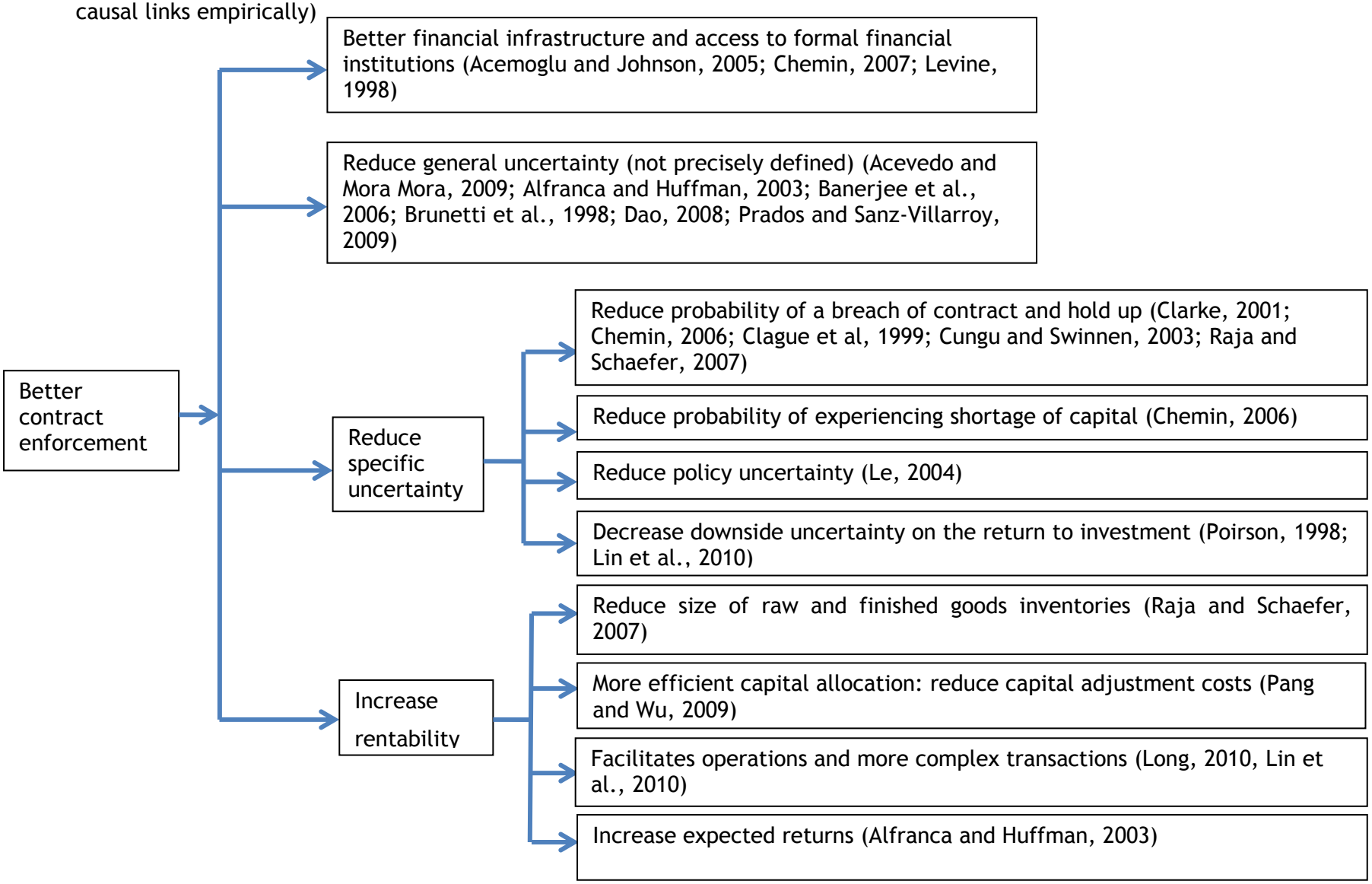
Almost all the studies implicitly or explicitly adhere to a basic story stating that effective third-party enforcement enables more complex contracting, and that contract uncertainty will tend to depress investment by affecting expected returns, increasing investment costs, restricting access to key resources, or making some complex transactions unfeasible. Thus, a first observation to be made is that several studies are not explicit about the causal pathways presumed to exist behind their specific empirical exercises. At least five studies (2, 5, 6, 10, 13) jump quickly from cursory remarks about a link between institutional uncertainty and investment to the analysis of the data (this and other remarks below are based on Table A.4.3 in Appendix 5).

Among the rest, there are those studies that elaborate slightly on the assumed mechanisms. In some of these cases, the elaboration is driven by the fact that the empirical exercise focuses on some specific component of overall capital accumulation (e.g. investments in R&D in 4, 9, 17; accumulation of inventories in 22). In other cases, conceptual elaboration seems related to a specific form of causal pathway that the authors want to justify, as it would eventually be confirmed by the evidence. In study 1, (better) contracting institutions are shown to have an effect on (a more developed) financial structure, which implies (greater) availability of funds for investments. In study 12, the authors provide evidence that can be interpreted to mean that better contract enforcement reduces delayed payments, which in turn have negative effect on investment. Lastly, the results in study 4 suggest that a worse contracting environment does not generally inhibit R&D investments, but it does when it happens jointly with a less efficient bureaucracy.

Synthetically, the main non-trivial mechanisms found in the included studies are:

- Weak enforcement encourages hold-up strategies (such as delayed payments to suppliers), that affect investments through impact on cash flows and indirectly through greater downward uncertainty of returns.
- Enhanced legal enforcement in a transition economy with financial repression may limit capital available to the private sector (which comes from 'leakage' from the state-owned enterprises), and thus depress private investment.
- Weak third-party enforcement involves higher costs to firms, from the need to get settlement through alternative mechanisms.
- Better contract enforcement facilitates the processes through which efficient-investing industries receive capital (i.e. reduces capital adjustment costs) and favours, in particular, relations/contract-intensive industries.
- Speed of adjudication is a key dimension of enforcement, in varied contexts, affecting investment decisions directly as well as through the ease of access to investment funds.

Figure 4.1: Mechanisms through which contract enforcement affects investment (with references to items hypothesising or testing the causal links empirically)



Regarding the contexts in which these mechanisms are thought to operate, the evidence analysed largely comes from developed and developing countries over the last third of the 20th century (although the one that takes a real-world reform process as a natural experiment, Chemin, 2006, observes institutional innovations happening early in the 21st century). Studies tend to include both developed and developing countries (presumably to increase the variance of the explanatory variable), and generally tend to offer limited evidence of the mechanisms operating differently by levels of development or politico-economic trajectories. The studies that raise this possibility tend to be focused on a few more homogeneous countries or a single one. The context of almost all the studies (by design as well as by data availability) is one in which countries experience changes in their institutional landscape more-or-less gradually, and these in turn are expected to have some effect over aggregate economic outcomes (with various confounding factors that are partially controlled for). The study of the microeconomics of contract enforcement and investment can be said to be seriously underdeveloped in the literature that claims to test for the existence of a link, and this will be hardly advanced by additional cross-country regressions or panel studies (studies 12, 17, 18 and 22 are noticeable exceptions, regardless of some limitations in execution of the empirical analysis).

Based on a quick and rough synthesis of the literature, one might be tempted to conclude that institutional change that fosters reliability of contracts (in some sense) will be likely to be rewarded with greater additions to a society's stock of capital. Fifteen of the 19 synthesised studies find a positive association between the 'intervention' and 'effect' variables, only one finds a negative effect and three find no effect. This 'quick and rough' impression is probably what policy makers (some being sponsors, in one way or another, of a good part of this literature) take away from casual observation of the research that has developed in the last couple of decades. The conclusion might have been reinforced but also additionally obscured by the tendency to conflate contracting institutions with institutions more specifically related to the protection of property rights (as pointed out by Acemoglu and Johnson, 2005).

However, the suspicion of publication bias in this literature is quite strong and fed by the observation that those few studies that do not find a 'positive' are constructed to make the null the 'expected' result (study 1), or do not have contract enforcement per se as the single key 'intervention' in their analysis (5, 20). Moreover, in these cases the ambiguity or negative result are largely inferred by us, the reviewers, and not stressed by the authors.

As seen, the outcomes observed tend to be investment rates defined as the ratio of investments to GDP. Only one study (19: Pang and Wu, 2009) questions whether that is the appropriate outcome to observe when testing the hypothesis of a link from contract enforcement to capital accumulation, and proposes to focus on value-added elasticities of investment, arguing that is a better measure of the response of investment to growth opportunities throughout an economy of heterogeneous agents and industries. The other studies that deviate from the focus on investment rates seem to do it based on a specific interest (e.g. investments in R&D) or driven by considerations of data availability. There does not seem to be any other pattern of outcomes being determined by dimensions of the context or mechanism, or vice versa).

5. Conclusions and implications

The findings of the systematic review reveal that the evidence on the impact of improvements in contract enforcement on investment is spotty, comes from a rather disjoint body of literature and generally does not meet the stronger standards for causal inference; only in roughly one every three studies does it meet some weaker though defensible standards for non-experimental data. The literature is thin, there are important ambiguities associated with the most widely used indicators of institutional change, there is a paucity of studies designed to address a 'cause-and-effect' question, and there are symptoms of publication bias.

Some of the hypothesised mechanisms through which enforcement of contracts may affect investment seem consistent with available evidence (for example, the causal channel through financial development, or through measures needed to mitigate the costs of breach of contract and the effect on the value of investment projects). However, much remains to be done in terms of research to justify policy strategies. It is unfortunate that only a few studies rely on 'objective' indicators of variation in enforcement across subnational jurisdictions, since these could yield more robust results with clearer policy implications. In many studies, the analytical approach is generally sound but the available indicator of quality of enforcement or breach of contracts has questionable validity. A significant number of studies are also of low quality due to their publication of a few 'positive' results but without discussion of sensitivity analyses. For policy makers and donor agencies, it seems that too much confidence has been put on plausible but unproven causal arguments.

5.1 Implications for policy and practice

The state's ability to enforce contracts effectively does not depend exclusively on the contents of the law or the procedures stipulated in formal rules. If the judiciary does not have the material resources to reduce processing times, the effectiveness of law in the books is weakened. One could thus think of investments in information technologies as a way to reduce the time and number of steps required to get a contract upheld. But that end is also served by effective private dispute settlement mechanisms, when they exist and are consistent with the overall legal framework (see, e.g. Woodruff, 1998, on the interplay between formal rules and informal enforcement instruments).

We recommend that development agencies and developing country stakeholders invest more resources to further the understanding, and allow research to disentangle the effects, of a variety of innovations that are hypothesised to impact on investment. From the included studies we identified a few of those possible 'innovations' that illustrate the scope for knowledge-generation initiatives. For example, amendments enacted in 2002 to India's Code of Civil Procedure (which dated as far back as 1908) were exploited by Chemin (2006) to define 'treatment' and 'control' groups of firms (according to their location in specific states. Among those identified amendments there were some giving judges the prerogative to proactively refer cases to alternative dispute resolution mechanisms (i.e. arbitration), or others setting limits to judicial discretion to delay the process. Chemin finds 57 of 89 amendments likely to influence judicial speed. If one takes the findings of the study seriously, it might make sense to look at those amendments for clues on the specific reforms that might be of interest to policy makers in other countries. Reform initiatives could then be promoted, accompanied at least by proper 'baseline' studies and follow-up investigation to generate knowledge on the

effects of reforms, and to enable the development of valuable lessons for other reform-minded agents.

Improving contract enforcement would seem to be a valuable objective in itself, as it would seem as a contributor and constituent of the 'rule of law' more broadly. Quite another thing is to advocate institutional reforms that will demand investment of political capital and other resources, to improve the expediency, predictability or fairness of judicial rulings, in the name of economic gains that are not yet proven in the scholarly literature. If evidence is to guide policy, policy makers and donors should continue investing resources in researching these causal links, perhaps with a more 'Popperian' approach of trying to falsify the hypotheses of 'conventional wisdom institutionalism', and keeping those that resist 'falsification' rather than those promising benefits based on (very weak) 'confirmations'.

5.2 Implications for research

Looking to the future, the research agenda would require a rebalancing. While the literature reviewed seems overwhelmingly in favour of the conventional assumption, more research seems to be needed to establish more solidly the empirical association between contract enforcement and investment. It is not yet clear if observed regularities are robust for various samples (for time spans, groups of countries sharing level of development or other features). While it seems possible to enhance the overall robustness of the empirical evidence by further statistical analysis of 'panels of countries' (and the development of new indicators of institutional quality will continue to feed that 'industry'), panels of subnational jurisdictions and/or firms would seem to hold more promise in terms of uncovering causal mechanisms.

The use of theory-based approaches, measuring the impact on intermediate outcomes along the causal chain could also shed light on the pathways of impact. More research is needed on the response to institutional innovations of firms, bureaucrats and other 'micro' agents that might be involved in the link through some indirect channel (e.g. banks). Available indicators of institutional changes have been used and there may be margins for broadening their analysis, but a focus on actual reform episodes and creative designs will take the literature a longer way towards unveiling mechanisms and causal pathways. Researchers in this particular field would contribute greatly to the understanding of those mechanisms by venturing to use untapped datasets (e.g. records from the judiciary system in one or more countries), by being more systematic in the analysis of data (e.g. discussing and addressing thorny endogeneity and causality issues in econometrics), and by taking care to report more of the actual action in the office (e.g. reporting robustness tests and/or other analyses not published that might say something about robustness).

Interested actors could also build their research agendas by consulting with local experts, business people and government officials, asking them to single out the key legal, administrative, or other institutional factors that account for deficient contract enforcement, and looking for opportunities to advance knowledge when reforms are introduced (but without subordinating key reform objectives to the design of 'impact evaluation projects').

5.3 Limitations of the study

The systematic review that leads us to the above-mentioned recommendations is not without limitations. Three of them deserve space here. First, to keep the review manageable, we did not include studies that only examine the effects of contract enforcement on intermediate outcomes (such as reduction in risk or access to credit for firms, which might ease their investment decisions). This consideration, and the

scarcity of included studies that use a theory-based approach examining the impact of intermediate outcomes, make it difficult to assess the mechanisms through which contract enforcement influences investment. While ideally one would want to cover a larger field with the review, the state of research on the determinants of investment is such that, in our opinion, it would be necessary to undertake parallel reviews on the effects of each of the putative determinants along the causal chain. This could be very valuable, but it was beyond our means when undertaking this project.

A second limitation (due to constraints on our access to databases and the full texts of certain documents) was the exclusion of postgraduate theses. These have been said to be at relatively lower risk of publication bias, but possibly at higher risk of softer or less specialised quality control (although the heterogeneity of quality standards might be large and any of these generalisations inappropriate for specific groups of higher education institutions). Like grey literature (especially working papers series), recent theses may contain today what academic journals will publish in a couple of years. In this sense, since the movement favouring 'causal designs' in economics is a fairly recent one, we cannot rule out the possibility that we might have missed some of it.

Regarding grey literature, there were some relevant institutional websites that we did not 'hand search' such as the World Bank, including the International Finance Corporation and DoingBusiness.org. We believe those to be largely covered by the repositories (e.g. EconPapers, RePEc) and search engines that we did use, and our overall coverage to be adequate. Due to our developing country base, we did not search library shelves for studies available in books, given the limited size and scope of our institutions' catalogues (but we did check some references to book chapters and did not find any that had to be included). The previous limitations may be addressed by adding to our systematic search.

6. References

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As indicated in the Section 3.3, three papers are excluded from the actual synthesis to avoid over-representing the same study that originated them. Those excluded are 3 (represented by 4) and 11 and 14 (represented by 12).

6.2. Excluded studies (at the full-text stage)

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Acemoglu D, Antràs P, Helpman E (2006) Contracts and technology adoption. *The American Economic Review* 97(3): 916-943.

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Appendices

Appendix 1.1: Authorship of this review

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This report should be cited as:

Aboal D, Noya N, Rius A (2012) A systematic review on the evidence of the impact on investment rates of changes in the enforcement of contracts. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

ISBN: 978-1-907345-41-8

Acknowledgements

Maria Eugenia Jung was the team's information specialist. Paola Cazulo, Sebastian Fleitas and Maren Vairo provided excellent research assistance. This research was possible thanks to the financial support of the DFID (Department for International Development). Support from EPPI-Centre's and 3ie's experts, and comments and suggestions on the protocol and the different drafts of this research report by anonymous referees are gratefully acknowledged. We also thank the participants of the 2011 MAER-Net colloquium at Cambridge University and the 2012 Campbell Collaboration Colloquium (Denmark) for their comments. The usual disclaimer applies.

Appendix 1.2: Search terms

Table 2.3. Keywords used in searches	
Type 1 Specific policy interventions and reforms	Type 2 Outcomes
enforceability of contracts	Investment
contract enforcement	capital investment
contracting institutions	capital accumulation
enforcement of contracts	capital formation
enforcement costs	capital stock
contracting institutions	R&D investment
contractual practices	R&D expenditure
contract non-performance	fixed assets
enforceability of agreements	machinery and equipment
contractual arrangements	Infrastructure
dispute resolution systems	growth
contractual unreliability	development
contractual reliability	business start up
contract hold-ups	
contract enforceability	
contract unenforceability	
judicial quality	
court enforcement	
contract intensity	
contractibility	
third part enforcement	
state enforcement	
judicial enforcement	
informal enforcement	
relational contracting	
formal enforcement	
limited enforcement	
limited enforceability	
ability to enforce contracts	
contract intensive money	
legal formalism	
business climate reform	
business environment reform	
judicial reform	
reform of the judiciary	
investment climate reform	
private sector development	

Appendix 2: Examples of excluded studies, with rationale

Author(s)	Year	Title	Reason for exclusion
Aizenman & Spiegel	2006	Institutional efficiency, monitoring costs, and the investment share of FDI	Outcome (dependent) variables are 'FDI over Gross Fixed Capital formation', and 'FDI over Private Domestic Investment'
Besley	1995	Property rights and investment incentives: theory and evidence from Ghana	It's about 'property rights' (over land) that may be weakly protected due to factors other than 'contract enforcement' (e.g., poor land titling institutions)
Bozovic	2008	Social capital and performance in transition	Interesting approach to 'informal institutions', but the outcome is share of profits that are reinvested. This is a 'financing' decision, not an 'investment' one
Cull and Xu	2005	Institutions, ownership and finance: the determinants of profit reinvestment among Chinese firms	Interesting indicators of quality of contract enforcement but it's about profit reinvestment, not firms' investment rates or levels
Dengu & Lyne	2007	Secure land rental contracts and agricultural investment in two communal areas of KwaZulu-Natal	Although called 'investment', the outcome variable is expenditures in agricultural inputs
Feng Lu and Yao	2009	The effectiveness of law, financial development, and economic growth in an economy of financial repression: evidence from China	Outcome variable is 'share of private investment in total investment'
Knack and Keefer	1995	Institutions and economic performance: cross-country tests using alternative institutional measures	Seminal because of the use of 'institutional measures'. Excluded because the 'performance' variable is 'growth of GDP', not investment
Koehling	2000	The economic consequences of a weak judiciary: insights from India.	Outcome is 'fixed productive capital per capita', not investment (or change in capital per capita)
Volchkova	2001	Does financial-industrial group membership affect fixed investment? Evidence from Russia	Relates quality of enforcement to membership in economic groups, but the outcome is rate of reinvested profits

Appendix 3: Coding tool

0 Unique identifier code

1 General descriptive information

1.1 Type of publication

- Institution/government report
- Refereed journal
- Non-refereed journal
- Book chapter
- Working paper series
- Conference paper
- Other
- Unknown

1.2 Publication status

- Published
- Forthcoming
- Unpublished
- Unknown

1.3 Source

- Electronic database
- Handsearch
- Citation
- Website
- Unknown

1.4 Language

- English
- French
- Portuguese
- Spanish

2 Study aims and rationale

2.1 Topic focus/foci of the study (tick as many as necessary)

- Contract enforcement and investment
- Contract enforcement and economic growth
- Institutions and investment
- Institutions and economic growth
- Finance and growth
- Finance and investment
- Contract enforcement and international trade

		Contract enforcement and finance
		Contract enforcement and vertical or horizontal integration
		Contract enforcement and substitutes or complements (social capital, trust, etc.)
		Reform of the judiciary
		Investment climate reform
		Private sector development
		Formal and informal enforcement
		Other (specify)
2.2	Is this report linked to one or more other reports (included in the searching results) in such a way that they also report the same study?	Linked (specify)
		Not linked
2.3	When was the study carried out? If the authors give a year, or range of years, then put that in. If not, give a 'not later than' date by looking for a date of first submission to the journal, or for clues like the publication dates of other reports from the study.	Explicitly stated (please specify)
		Implicit (please specify)
		Not stated/unclear (please specify)
2.4	Geographic scope	Individual country (specify)
		Group of countries (specify)
		Individual region inside a country (specify)
		Group of regions inside a country (specify)
2.5	Research design	Quantitative studies
		Cross-section regression
		Panel data regression
		Time series regression
		Others (specify)
		Qualitative studies
		Historical
		Narrative
		Observation

		Survey
		Audit
		Action-based
		Case series
		Expert opinion
		Focus group
		Other (specify)
2.6	Type of investment	Fixed assets in general
		Machinery and equipment
		R&D expenditure
		Infrastructure
		Other (specify)
		Not stated
2.7	Origin of investment	Domestic
		Foreign
		General
		Group of countries (specify)
		Country (specify)
2.8	Unit(s) of analysis	Country(ies).
		Subnational jurisdiction(s)
		Industry(ies).
		Firm(s) (any size and legal status)
		Households or individuals

3 CRITICAL APPRAISAL QUESTIONS

Quality of study - reporting

3.1	Is the context of the study adequately described?	Yes (please specify)
		No (please specify)
3.2	Are the aims of the study clearly reported?	Yes (please specify)
		No (please specify)
3.3	Is there an adequate description of the sample used in the study and how the sample was identified?	Yes (please specify)
		No (please specify)

3.4	Is there an adequate description of the methods used in the study to collect data?	Yes (please specify) No (please specify)
3.5	Is there an adequate description of the methods of data analysis?	Yes (please specify) No (please specify)
3.6	Do the authors avoid selective reporting bias?	Yes (please specify) No (please specify)

Quality of the study – methods

3.7	Are there ethical concerns about the way the study was done? *Consider consent, funding, privacy, etc.*	Yes, some concerns (please specify) No (please specify)
3.8	Were potential users of the research appropriately involved in the design or conduct of the study?	Yes (please specify) No (please specify)
3.9	Was the choice of research design appropriate for addressing the research question(s) posed?	Yes (please specify) No (please specify)
3.10	Have sufficient attempts been made to establish the repeatability or reliability of data collection methods or tools?	Yes (please specify) No (please specify)
3.11	Have sufficient attempts been made to establish the repeatability or reliability of data analysis?	Yes (please specify) No (please specify)
3.12	To what extent are the research design and methods employed able	A lot (please specify)

	to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?	A little (please specify) Not at all (please specify)
3.13	How generalisable are the study results?	Details
3.14	In light of the above, do the reviewers differ from the authors over the findings or conclusions of the study? Please state what any difference is.	Not applicable (no difference in conclusions) Yes (please specify)
3.15	What is the overall quality of the study? (taking into account all the quality assessment issues)	High (quality) Medium (quality) Low (quality)
Relevance		
3.16	Can the study deliver inferences about the mechanisms at work in the review question?	Yes Yes, some No
3.17	Can the study deliver inferences about the effectiveness of the intervention/independent variable of the review question?	Yes No
Weight of evidence		
3.18	Weight of evidence A: Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)? How good is the execution of the study? In some studies it is difficult to distinguish between the findings of the study and the conclusions. In those cases, please code the trustworthiness of these combined	High trustworthiness Medium trustworthiness Low trustworthiness

		results/ conclusions	
	3.19	Weight of evidence B: Appropriateness of research design for allowing causal inference	High: RCTs Medium: non-randomly allocated prospective evaluations Low: all other study designs
	3.20	Weight of evidence C: Relevance of particular focus of the study for addressing the question, or sub-questions, of this specific systematic review	High Medium Low
	3.21	Weight of evidence D: Overall weight of evidence. Taking into account quality of execution, appropriateness of design and relevance of focus, what is the overall weight of evidence this study provides to answer the question of this specific systematic review?	High Medium Low
4	Results and conclusions		
	4.1	Outcome: impact evaluation	Quantitative studies Average impact coefficient (preferred specifications) Standard deviation of average impact Significance Upper limit of the 95% interval of confidence Lower limit of the 95% interval of confidence Qualitative studies Strong impact Low impact No impact Not applied

4.2	Mechanism: what and how channels of intervention work to enhance the quality of contract enforcement	Contract enforcement and finance (describe) Contract enforcement and international trade (describe) Contract enforcement and vertical or horizontal integration (describe) Other (specify and describe)
4.3	Mechanism: what and how channels of intervention do NOT work to enhance the quality of contract enforcement	Contract enforcement and finance (describe) Contract enforcement and international trade (describe) Contract enforcement and vertical or horizontal integration (describe) Other (specify and describe)
4.4	Measurement of quality of contract enforcement used	Expert opinion Ordinal Cost and time of judicial procedures Other (specify) Business survey Ordinal Cost and time of judicial procedures Other (specify) Contract intensity money (CIM) Informal enforcement Others (specify)
4.5	Measurement of investment	Level Rate (investment/GDP) Rate (flux/stock) Stock (i.e. accumulated investment; level of asset) Others (specify)
4.6	Do the author(s) refer to other previous studies and refute or confirm their results?	No Not clear Yes, to confirm (included in our review; specify) Yes, to confirm (not included in our review) Yes, to refute (included in our review; specify) Yes, to refute (not included in our review) Yes, ambiguous results (included in our review; specify) Yes, ambiguous (not included in our review)
4.7	Strength of findings	No clear conclusions can be drawn. Not significant Results ambiguous, but there appears to be a trend. Conclusions can probably be based on the results.

Results are clear and very likely to be true.

Results are unequivocal.

Appendix 4: Tables for Section 3

Table A.3.1: Publication type

Refereed journal	13
Working paper or conference paper series	6

Table A.3.2: Topic focus/foci of the studies

Contract enforcement and investment	10
Institutions and investment	11
Contract enforcement and economic growth	5
Institutions and economic growth	5
Finance and investment	2
Other	7

Note: more than one topic allowed for each study

Table A.3.3: Unit of analysis by geographic scope

Unit of analysis	Geographic scope		
	Individual country	Group of countries	Regions within a country
Countries	1	12	0
Firms	2	1	2
Industries	0	1	0

Table A.3.4: Type of data

Cross section	12
Panel data	6
Time series	1
Narrative	1
Case series	1

Table A.3.5: Type of investment

Fixed assets in general	14
R&D	3
Infrastructure	1
Inventories	1

Table A.3.6: Measure of contract enforcement

Expert judgements	10
Business surveys	5
Contract-intensive money	3
Other	1

Appendix 5: Tables for Section 4

Table A.4.1.A: Summary information: included studies

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
1	Acemoglu and Johnson (2005)	**Legal formalism** (1 to 7 scale), Djankov et al (2003); Overall procedural complexity, (0 to 10 scale), and number of distinct procedures to collect debt, World bank (2004).	**Investment ratio to GDP** at current prices (averaged over 1991-1999). Source: Penn World Tables	Coeff: −0.8 S.E. (1.55) *t* : 0.516 Signif: No	-0.6 (1.10) 0.545 No	-0.08 (0.23) 0.348 No	Cross section. Instrumental variables (IV).	Country(ies)
2	Acevedo and Mora Mora (2009)	**Private property rights**: judiciary ability to provide legal support and protect private property. Source: The Heritage Foundation.	**Investment ratio to GDP**. Source: Penn World Table 6.2.	Coeff: 2.285 S.E. NA *t*: NA Signif: ***			Panel data. Cointegration analysis.	Country(ies)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
4	Alfranca and Huffman (2003)	**Contract enforcement:** Relative degree to which contractual agreements are honoured and complications presented by language and mentality difference. Source: BERI. **Contract enforcement: bureaucracy** (efficient bureaucracy: 0-4 score for civil service's speed and efficiency).	**Aggregate private investment in agricultural R&D**. Source: OECD, Statistical Compendium, Industry, Science and Technology (2001) and OECD, Statistical Compendium, National Accounts (2001).	Coeff: −0.954 S.E. (0.281) *t* : 3.40 Signif: ***	Coeff: 0.959 S.E. (0.122) *t* : 7.84 Signif: ***		Panel data. Seemingly unrelated regression (SUR). Pooled.	Country(ies)
5	Banerjee et al. (2006)	**Rule of law** (RULELAW). Source: ICRG database (2003).	**Greenfield infrastructure investment.** Source: World Bank's Private Participation in Infrastructure (PPI) database (2004).	Coeff: −0.27 S.E. (0.23) *t* : 1.174 Signif: No			Panel data. Pooled OLS.	Country(ies)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
6	Brunetti et al. (1998)	**Predictability of judiciary enforcement** (average of questions 1-4 of the Private Sector Survey conducted in the context of the World Development Report 1997).	**Annual average of investment in percent of GDP** for two periods: 1980-1992 (Invest8092) and 1970-1992 (Invest7092). Source: Penn World Tables 5.6.	Coeff: 2.92 S.E. (0.896) *t* : 3.26 Signif: ***			Cross-section data, OLS.	Country(ies)
7[b]	Chemin (2006)	**Count of amendments that increase judiciary efficiency**, around 2002 Amendment Act (judicial reform) taking into account the amendments already enacted by states in a period earlier than the 'before' date. Source: India's Code of Civil Procedure.	Net addition to plant and machinery assets (P and M)	Coeff: 0.0044 S.E. (0.001) *z* : 3.65 Signif: ***			Panel data. Difference-in-differences.	Firm(s)
			Net addition to tools and other fixed assets (T and FA).	Coeff: 0.0408 S.E. (0.015) *z* : 2.73 Signif: ***				

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
			Net addition to transport and equipment assets owned during last 365 days (T and EA). Source: India's National Sample Survey (55th and 57th rounds).	Coeff: 0.0039 S.E. (0.001) *z* : 2.77 Signif: ***				
8	Clague et al. (1999)	**Contract-intensive money** (CIM). Source: International Financial Statistics (IFS).	**Investment as a percentage of GDP**. Source: Summers and Heston (1991).	Coeff: 20.745 S.E. (5.457) *t:* 3.8 Signif: ***			Cross-section regressions. Qualitative study: narrative and case series.	Country(ies)
9	Clarke (2001)	**Rule of Law**. Source: International Country Risk Guide (ICRG).	**Research and Development Expenditures** as % of GDP. Source: UNESCO Statistical Yearbook.	Coeff: 0.0452 S.E. (0.026) *t:* 1.72 Signif: *			Panel data. Fixed effects regressions.	Country(ies)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
10	Commander and Tinn (2008)	**Procedures/Time/Cost** (from Doing Business surveys/reports).	**Gross fixed capital formation to GDP** (source not cited).	Coeff: −0.104 S.E. NA *t:* NA Signif: *	Coeff: 0.000 S.E. NA *t:* NA Signif: No	Coeff: -0.031 S.E. NA *t:* NA Signif: No	Cross-section data OLS	Country(ies)
12	Cungu and Swinnen (2003)	**Ineffective court enforcement of contracts**. Source: Country-wide survey of Hungarian agricultural enterprises.	**Flow of gross capital investment as a % of gross capital stock.** Source: Country-wide survey of Hungarian agricultural enterprises.	Coeff: 8.23 S.E. (7.764) *z:* 1.06 Signif: No			Cross-section data. Tobit model and Two stage conditional maximum likelihood approach (TSCML) (ordered Probit).	Firm(s)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
13	Dao (2008)	**Courts constraint** (share of senior managers that ranked 'courts and dispute resolution systems' as a major or very severe constraint). Source: 2005 World Development Report.	Share of gross capital formation to GDP. Source: 2005 World Development Report.	Coeff: −0.408 S.E. (0.153) *t:* 2.66 Signif: ***			Cross-section data, OLS.	Country(ies)
15	Le (2004)	**Contract-intensive money**/variability of contract-intensive money.	**Private investment as a percentage of GDP.** Source: International Finance Corporation (IFC).	Coeff: 0.222 S.E. (0.017) *t:* 13.06 Signif: ***	Coeff: 0.01 S.E. (0.002) t: 5 Signif: ***		Panel data. Feasible generalised least squares (FGLS).	Country(ies)
16	Levine (1998)	**ENFORCE (efficiency of legal system):** average or rule of law (ICRG) that measures 'the degree to which citizens are willing to accept the established institutions to make and implement laws and to adjudicate disputes' (responses on a 1-10 scale) (1-10).	Per capita capital stock growth. Source: King and Levine (1994).	Indirect effect (+). Direct effect NA			Cross-section data. Generalised method of moments (GMM). Instrumental variables (IV).	Country(ies)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
17	Lin et al. (2010)	**Contract** (dummy variable indicating whether a firm usually signs written contracts with its clients**).** **Contract upheld** (the managers' response to the question: 'what is the likelihood that the legal system will uphold my contracts and property rights in business disputes' (on a 0-1 scale; 0 is totally unlikely, 1 is certainty) (0-1). Joint World Bank and Enterprise Survey Organization of China.	**R&D intensity** (the amount of R&D spending as a percentage of total sales). Source: Joint World Bank and Enterprise Survey Organization of China	Coeff: 0.026 S.E. NA *t:* NA Signif: ***	Coeff: 0.012 S.E. NA *t:* NA Signif: **		Cross section. Tobit model with instrumental variables.	Firms

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
18	Long (2010)	**Quality of local courts** (percentage of all business disputes resolved that are resolved through the courts system by all firms in the same industry and city). **Quality of non-local courts** (percentage of all business disputes resolved that are resolved through the courts system by all firms in the same industry but in all other cities). World Bank's 2001 Investment Climate survey	**Investment rate** (ratio between investments made in 2000 and total fixed assets in 1999). Source: World Bank's 2001 Investment Climate survey.	Coeff: 0.03 S.E. (0.015) *t:* 2.03 Signif: **	Coeff: 0.093 S.E. (0.05) *t:* 1.86 Signif: *		Cross-section data. OLS	Firms

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
19[c]	Pang and Wu (2009)	Interaction of **Contract intensity** (Nunn, 2007) with **Index of the quality of contract enforcement and courts.** Source: Kaufmann, Kraay and Mastruzzi (2005). **Index of legal quality.** Source: Gwartney and Lawson (2007). **Index of legal quality.** Source: La Porta et al. (1998)	Industrial investment elasticity to value added (as a measure of the efficiency of capital allocation). Source: United Nations Industrial Development Organization (UNIDO) database.	Coeff: 0.423 S.E. (0.097) *t:* 4.36 Signif: ***	Coeff: 0.242 S.E. (0.054) t: 4.48 Signif: ***	Coeff: 0.182 S.E. (0.046) t: 3.96 Signif: ***	Cross-section data. OLS and IV.	Indust-ries
20	Poirson (1998)	**Rule of Law (RULELAW).** Source: International Country Risk Guide (ICRG) database.	**Nominal private fixed investment** in percentage of nominal GDP (using current local currency). Source: World Economic Outlook, World Bank.	NA			Panel data. Fixed effects and random effects regressions.	Country(ies)

N.	**Authors**	**Indicator(s) for variation in contract enforcement**	**Investment indicator(s)**	**Coefficients of contract enforcement variables (standard error, t−statistic and significance)**[a]			**Research design/ methodology**	**Unit(s) of analysis**
				Variable 1	**Var. 2**	**Var. 3**		
21	Prados de la Escosura and Sanz-Villarroy (2009)	**Contract-intensive money.** Source: Cortés Conde (1998a), Della Paolera et al (2003) and IMF (2003).	**Investment ratio to GDP.** Source: Della Paolera et al (2003).	Coeff: 0.187 S.E. (0.098) *t:* 1.903 Signif: *			Time series. SUR.	Country(ies)
22	Raja and Schaefer (2007)	**Protection of Property Rights.** Source: Heritage Foundation's 2003 Index of Economic Freedom.	Ratio of total inventories to net sales. Source: online portal Shibui Markets.	Coeff: 0.03 S.E. (0.00) *t:* 4.42 Signif: ***			Cross-section data, OLS.	Firm(s)

Notes: Signif. *=10%, **=5%, ***=1%.; NA=not available, S.E.=standard error, t=t-statistic, z=z-statistic.

a/ Coefficients associated with the different contract enforcement (CE) indicators listed in col. 3 of the table.

b/ the authors also use three additional CE indicators, all of which have positive coefficients: procedural complexity index for collecting an unpaid debt which is worth 50% of per capita income. Source: World bank (2004); Number of legal procedures associated with collecting an unpaid debt. Source: World bank (2004); Procedural complexity index for collecting an unpaid cheque. Source: Djankov et al (2003).

c/ They also carried out regressions with three additional variables: Interaction of contract intensity with procedural complexity index for collecting an unpaid debt which is worth 50% of per capita income (coef: −0.019 / sd: 0.007), with number of legal procedures associated with collecting an unpaid debt (coef: −0.024 / sd: 0.013) and with procedural complexity index for collecting an unpaid cheque (coef: −0.223 / sd: 0.088).

Source of the coefficients (in the original papers): (1): Table 4, Panel B, cols 1,3,4; (2): Table 2, col. 2; (4): Table 4, equation 1; (5): Table 7, col. 8; (6): Table 7, col. 4; (7): Table 3, cols 1 to 3; (8): Table 3, col. 1; (9): Table 3, col. 1; (10): Table 3, col. 1; (12): Table I, col. 1; (13): Table 1; (15): Table 3, col. 7; (16): Table 4, col. 2; (17) Table 6, col. 4; (18) Table 4 col. 1; (19): Table 2 cols 1 to 3; (20): In text; (21): Table 2, col. 2; (22): Table 1.

Table A.4.1.B Summary information: included studies: intermediate outcomes

N.	Authors	Indicator(s) for variation in contract enforcement	Intermediate outcome(s)	Coefficients of contract enforcement variables (standard error, t−statistic and significance)[a]			Research design/ methodology	Unit(s) of analysis
				Variable 1	Var. 2	Var. 3		
1	Acemoglu and Johnson (2005)	Legal formalism (1 to 7 scale), Djankov et al (2003); Overall procedural complexity, (0 to 10 scale), and number of distinct procedures to collect debt, World bank (2004).	Intermediate outcome 1: **Credit to private sector** as a percentage of GDP in 1998. Source: World Bank (2003). Intermediate outcome 2: **Stock market capitalisation** as a percentage of GDP averaged over 1990-95. Source: Beck et al (2001).	Coeff: −0.08 S.E. (0.08) *t* : 1.00 Signif: No Coeff: −0.16 S.E. (0.07) *t* : 2.286 Signif: **	Coeff: −0.05 S.E. (0.06) *t*: 0.833 Signif: No Coeff: −0.11 S.E. (0.06) *t* : 1.833 Signif: *	Coeff: −0.010 S.E. (0.012) *t* : 0.833 Signif: No Coeff: −0.022 S.E. (0.013) *t* : 1.692 Signif: *	Cross section. Instrumental variables (IV).	Country (ies)
7[b]	Chemin (2006)	Count of amendments that increase judiciary efficiency, around 2002 Amendment Act (judicial reform) taking into account the amendments already enacted by states in a period earlier than the 'before' date.	**Shortage of capital** as the probability of experiencing such problem. Source: not cited.	Coeff: −0.064 S.E. (0.015) *z*: 4.28 Signif: ***			Panel data. Difference-in-differences.	Firm(s)

N.	Authors	Indicator(s) for variation in contract enforcement	Intermediate outcome(s)	Coefficients of contract enforcement variables (standard error, t−statistic and significance)[a]			Research design/ methodology	Unit(s) of analysis
				Variable 1	Var. 2	Var. 3		
		Source: India's Code of Civil Procedure.	**Loan from a formal institution** as the probability of obtaining such loan if the enterprise obtained a loan. Source: not cited. **Loan from a business friend** as the probability of obtaining such loan if the enterprise obtained a loan. Source: not cited. **Loan from a relative** as the probability of obtaining such loan if the enterprise obtained a loan. Source: not cited.	Coeff: 0.0487 S.E. (0.018) z: 2.73 Signif: *** Coeff: 0.0285 S.E. (0.066) z: 0.43 Signif: No Coeff: 0.0297 S.E. (0.03) z: 0.99 Signif: No				

N.	Authors	Indicator(s) for variation in contract enforcement	Intermediate outcome(s)	Coefficients of contract enforcement variables (standard error, t−statistic and significance)[a]			Research design/ methodology	Unit(s) of analysis
				Variable 1	Var. 2	Var. 3		
8	Clague et al. (1999)	**Contract-intensive money** (CIM). Source: International Financial Statistics (IFS).	**Insurance as a percentage of GDP**. Source: UN National Accounts.	Coeff: 7.682 S.E. (2.765) t: 2.778 Signif: ***			Cross-section regressions. Qualitative study: narrative and case series.	Country (ies)
			Finance as a percentage of GDP. Source: UN National Accounts.	Coeff: 11.007 S.E. (2.686) t: 4.098 Signif: ***				
10	Commander and Tinn (2008)	**Procedures/time/cost** (from Doing Business surveys/reports).	**Private credit to GDP** (source not cited).	Coeff: −0.691 S.E. NA t: NA Signif: No	Coeff: 0.006 S.E. NA t: NA Signif: No	Coeff: 0.098 S.E. NA t: NA Signif: No	Cross-section data OLS	Country (ies)

N.	Authors	Indicator(s) for variation in contract enforcement	Intermediate outcome(s)	Coefficients of contract enforcement variables (standard error, t−statistic and significance)[a]			Research design/ methodology	Unit(s) of analysis
				Variable 1	Var. 2	Var. 3		
			Size of informal economy (source not cited).	Coeff: 0.049 S.E. NA t: NA Signif: No	Coeff: 0.004 S.E. NA t: NA Signif: No	Coeff: −0.071 S.E. NA t: NA Signif: No		
12	Cungu and Swinnen (2003)	**Ineffective court enforcement of contracts**. Source: Country-wide survey of Hungarian agricultural enterprises.	**Delayed payments:** discrete variable for whether firms consider delayed payments unimportant (0), fairly important (1) or important (2). Source: Country-wide survey of Hungarian agricultural enterprises.	Coeff: 0.38 S.E. (0.147) z: 2.58 Signif: **			Cross-section data. Tobit model and Two stage conditional maximum likelihood approach (TSCML) (Ordered Probit)	Firm(s)

N.	Authors	Indicator(s) for variation in contract enforcement	Intermediate outcome(s)	Coefficients of contract enforcement variables (standard error, t−statistic and significance)[a]			Research design/ methodology	Unit(s) of analysis
				Variable 1	Var. 2	Var. 3		
16	Levine (1998)	**ENFORCE (efficiency of legal system):** average or rule of law (ICRG) that measures 'the degree to which citizens are willing to accept the established institutions to make and implement laws and to adjudicate disputes' (on a 1 to 10 scale) (1-10).	**Banking development** as loans made by deposit-taking banks to the private sector over GDP. Data from Levine and Zervos (1998)	Coeff: 0.16 S.E. NA t: NA Signif: ***			Cross-section data. Generalised Method of Moments (GMM). Instrumental variables (IV)	Country (ies)

Notes: Signif. *=10%, **=5%, ***=1%.; NA=Not Available, S.E.=standard error, t=t-statistic, z=z-statistic.

a/ Coefficients associated with the different contract enforcement (CE) indicators listed in column 3 of the table.

b/ The authors also use three additional CE indicators, all of which have positive coefficients: procedural complexity index for collecting an unpaid debt which is worth 50% of per capita income. Source: World bank (2004); Number of legal procedures associated with collecting an unpaid debt. Source: World bank (2004); Procedural complexity index for collecting an unpaid cheque. Source: Djankov et al (2003).

Source of the coefficients (in the original papers): (1): Table 5, Panels A and B, cols 1,3,4; (7): Table 4; (8): Table 1, cols 1 and 4; (10): Table 3; (12): Table II; (16): Table 3.

Table A.4.2: Summary of papers' findings

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
1	Acemoglu and Johnson (2005)	**Legal formalism** (1 to 7 scale), Djankov et al (2003); Overall procedural complexity, (0 to 10 scale), and number of distinct procedures to collect debt, World bank (2004)	**Investment ratio to GDP** at current prices (averaged over 1991-1999). Source: Penn World Tables	NS	NS	NS	-	Contracting institutions affect the form of financial intermediation, not investment (they are superseded by PR institutions)	med	3
2	Acevedo and Mora Mora (2009)	**Private property rights**: judiciary ability to provide legal support and protect private property. Source: The Heritage Foundation	**Investment ratio to GDP.** Source: Penn World Table 6.2.	+			NS	The variable judiciary is positively correlated with Investment/GDP	low	1

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
4	Alfranca and Huffman (2003)	**Contract enforcement:** Relative degree to which contractual agreements are honoured and complications presented by language and mentality difference. Source: BERI	**Aggregate private investment in agricultural R&D.** Source: OECD, Statistical Compendium, Industry, Science and Technology (2001) and OECD, Statistical Compendium, National Accounts (2001).	+				Better contract enforcement increases aggregate private agricultural R&D investment	med / low	2
5	Banerjee et al. (2006)	**Rule of law** (RULELAW). Source: International Country Risk Guide (ICRG) database (2003).	**Greenfield infrastructure investment.** Source: World Bank's Private Participation in Infrastructure (PPI) database (2004).	NS			−	Better contract enforcement is not correlated with greenfield investment in infrastructure (reviewers' conclusion).	low	1

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
6	Brunetti et al. (1998)	**Predictability of judiciary enforcement** (average of questions 1-4 of the Private Sector Survey conducted in the context of the World Development Report 1997).	**Annual average of investment in percent of GDP** for two periods: 1980-1992 (Invest8092) and 1970-1992 (Invest7092). Source: Penn World Tables 5.6.	+				Predictability of judiciary enforcement is positively correlated with investment.	med / low	1

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
7[d]	Chemin (2006)	**Count of amendments that increase judiciary efficiency**, around 2002 Amendment Act (judicial reform) taking into account the amendments already enacted by states in a period earlier than the 'before' date. Source: India's Code of Civil Procedure.	**Net addition to plant and machinery assets**. **Net addition to tools** and other fixed assets. **Net addition to transport and equipment assets** owned during last 365 days. Source: India's National Sample Survey (55th and 57th rounds).	+				A speedier judiciary decreases the probability of experiencing a breach of contract and increases the incentives to invest.	high /med	3
8	Clague et al. (1999)	**Contract-intensive money** (CIM). Source: International Financial Statistics (IFS).	**Investment as a percentage of GDP**. Source: Summers and Heston (1991).	+				CIM is positively related to investment	med / low	3

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
9	Clarke (2001)	**Rule of law**. Source: International Country Risk Guide (ICRG)	Research and Development Expenditures as % of GDP. Source: UNESCO Statistical Yearbook	+			NS	Countries with weaker rule of law tend to have lower R&D expenditures	low	1
10	Commander and Tinn (2008)	**Procedures/time/cost** (from Doing Business surveys/reports)	**Gross fixed capital formation to GDP** (source not cited)	−	NS	NS		Investment is unrelated to most Doing Business indicators, while there is a weak association with procedures to deal with licenses and contract enforcement	med / low	

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoED	CI
12	Cungu and Swinnen (2003)	**Ineffective court enforcement of contracts**. Source: Country-wide survey of Hungarian agricultural enterprises.	**Flow of gross capital investment** as a % of gross capital stock. Source: Country-wide survey of Hungarian agricultural enterprises.	– indirect effect, NS direct effect				Ineffective contract enforcement positively affects delayed payments. Contract breaches, in the form of delayed payments, have a significant negative effect on investment level.	med /low	2
13	Dao (2008)	**Courts constraint** (share of senior managers that ranked 'courts and dispute resolution systems' as a major or very severe constraint). Source: 2005 World Development Report.	**Share of gross capital formation to GDP**. Source: 2005 World Development Report	–				Courts constraints linearly affect the share of gross capital formation to GDP of developing countries	low	1

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
15	Le (2004)	**Contract-intensive money.** **Variability of contract-intensive money.**	**Private investment as a percentage of GDP.** Source: International Finance Corporation (IFC).	+	+			Contract enforcement and its variability are positively correlated with investment	low	1
16	Levine (1998)	**ENFORCE (efficiency of legal system):** average or rule of law (Source: ICRG) that measures 'the degree to which citizens are willing to accept the established institutions to make and implement laws and to adjudicate disputes' (1-10).	Per capita capital stock growth. Source: King and Levine (1994)	+				The data indicate a close relationship between the legal system and banking development, and between banking development and capital stock growth	med /low	3

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
17	Lin et al. (2010)	**Contract** (dummy variable indicating whether a firm usually signs written contracts with its clients) **Contract upheld** (the managers' response to the question: 'what is the likelihood that the legal system will uphold my contracts and property rights in business disputes' (on a 0 to 1 scale) (0-1)	**R&D intensity** (the amount of R&D spending as a percentage of total sales)	+	+			Contract enforcement plays an essential role in promoting corporate R&D	med /low	3

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
18	Long (2010)	**Quality of local courts** (percentage of all business disputes resolved that are resolved through the courts system by all firms in the same industry and city). **Quality of non-local courts** (percentage of all business disputes resolved that are resolved through the courts system by all firms in the same industry but in all other cities).	**Investment rate** (ratio between investments made in 2000 and total fixed assets in 1999).	+	+			Higher proportions of business disputes settled through the courts system is correlated with a higher investment rate	med /low	2

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
19[e]	Pang and Wu (2009)	Interaction of **Contract intensity** (Nunn, 2007) with **Index of the quality of contract enforcement and courts.** Source: Kaufmann, Kraay and Mastruzzi (2005). **Index of legal quality.** Source: Gwartney and Lawson (2007). **Index of legal quality.** Source: La Porta et al. (1998).	**Industrial investment elasticity to value added** (as a measure of the efficiency of capital allocation). Source: United Nations Industrial Development Organization (UNIDO) database.	+	+	+	NS	Countries with better contract enforcement tend to have more efficient capital allocation in industries which are more contract-intensive.	med	3
20	Poirson (1998)	**Rule of law** (RULELAW). Source: International Country Risk Guide (ICRG) database.	Nominal private fixed investment in percentage of nominal GDP (using current local currency). Source: World Economic Outlook, World	NS				Once civil liberties, the quality of the bureaucracy, and the risk of expropriation are controlled for in the regression, rule of law	med /low	1

N.	Authors	Indicator(s) for variation in contract enforcement	Investment indicator(s)	Dependent variables. Authors' preferred specification (reviewers' interpretation) (signs shown only if significant)[a]			Addition-al results[b]	Main conclusion (according to authors when available)[c]	Quality assess-ment	
				Variable 1	Var. 2	Var. 3			WoE D	CI
			Bank					became NOT significant		
21	Prados de la Escosura and Sanz-Villarroy (2009)	**Contract-intensive money.** Sources: Cortés Conde (1998a), Della Paolera et al. (2003) and IMF (2003).	**Investment ratio to GDP.** Source: Della Paolera et al. (2003).	+				Poor compliance with contracts hindered investment in broad capital	low	1
22	Raja and Schaefer (2007)	**Protection of property rights.** Source: Heritage Foundation's 2003 Index of Economic Freedom.	**Ratio of total inventories to net sales**. Source: online portal Shibui Markets.	+				The level of inventory holdings tends to rise with the probability of breach or lack of enforcement.	med /low	2

Notes: NS= Not significant.

a/ Sign of coefficients associated with the different contract enforcement (CE) indicators used in regressions (col. 3 of the table, in the same order of appearance)

b/ best interpretation of reviewers

c/ different results for at least one of the variables

d/ the authors also use three additional CE indicators, all of which have positive coefficients

e/ They also carried out regressions with three additional variables, all of which have negative coefficients.

Source of the coefficients (in the original papers): (1):Table 4, Panel B, cols 1,3,4; (2): Table 2, col. 2; (4): Table 4; (5): Table 7, col. 8; (6): Table 7, col. 4; (7): Table 3, cols 1 to 3; (8): Table 3, col. 1; (9): Table 3, col. 1; (10): Table 3, col. 1; (12): Table I, col. 1 and Table II, col. 5; (13): Table 1; (15): Table 3, col. 7; (16): Table 3, col. 1 and Table 4, col. 2; (17) Table 6, col. 4; (18) (18) Table 4 col. 1; (19): Table 2; (20): In text; (21): Table 2, col. 2; (22): Table 1.

Table A.4.3: Context-mechanism-outcome analysis for included studies

N.	Authors	Mechanism	Context	Outcome
1	Acemoglu and Johnson (2005)	Contract enforcement institutions influence financial structure, and institutions that protect property rights influence investment levels. Economic agents would structure contracts to address failure of existing enforcement mechanisms, but find it harder to circumvent threats of expropriation	71 countries that are former European colonies Economic performance measured ca. 1995 and averages over 1960 or 1970 to 1995-98	No direct effect [outcome: investment rate]
2	Acevedo and Mora Mora (2009)	General remark on quality of institutions, uncertainty and investment to justify empirical exercise	20 Latin American countries over 1995-2003	Positive association of judiciary's capacity on [outcome: investment rate]
4	Alfranca and Huffman (2003)	Insecure contractual rights for discoveries made by the private sector reduce the expected return and increase the riskiness of investments. Bureaucratic delays reduce expected commercial payoffs, make project management more difficult, influence participating firms' project selection	Seven EU countries between 1984 and 1995 Process of investment in agriculture R&D by private and public sector, in a 'common market' with still significant country specificities	The relative degree to which contractual agreements are honoured (and there aren't complications due to language and mentality difference) has a positive association with aggregate private investment in **[outcome: agricultural R&D]**, when interacted with bureaucratic delays Contract enforcement and efficient bureaucracy are complements for affecting aggregate private R&D investment

N.	Authors	Mechanism	Context	Outcome
5	Banerjee et al. (2006)	General remark on quality of institutions, uncertainty and investment to justify empirical exercise	40 developing economies between 1990 and 2000 Investment on infrastructure lends itself to a complex risk profile (high sunk costs, irreversibilities) and a promise of high returns	Effective enforceability of the rule of law is negatively associated with **[outcome: Greenfield private participation in infrastructure projects]** (*reviewers' conclusion*)
6	Brunetti et al. (1998)	General remark on quality of institutions, uncertainty and investment to justify empirical exercise	52 countries, firm managers' views on policies/institutions ca. 1996 and ten years earlier Economic performance measured 1970-92	Predictability of judicial enforcement is positively associated with **[outcome: investment rate]**
7	Chemin (2006)	'[A] speedier judiciary decreases the probability to experience a breach of contract, increases the incentives to invest, decreases the probability to experience shortage of capital, favors access to formal … financial institutions and thickens rental markets' (p.27)	India's 2002 enactment of the Code of Civil Procedure Amendment Act States (i.e. subnational governments) had different regimes; rules that existed in some states from before were made 'national' by amendment, creating a 'natural experiment'	Process amendments that increased judicial efficiency had positive effect on **[outcome: firms' net additions to fixed productive assets]**

N.	Authors	Mechanism	Context	Outcome
8	Clague et al. (1999)	Without third-party enforcement, contracts between distant, unknown parties, or exchanges that take place over time, may break down, hindering investment and growth	Seven large and small developing countries seem to validate the indicator, 1969-90 95-country sample of developed and developing countries tests the hypotheses Economic performance measured between 1970 and 1990	Countries with a high level of the indicator of quality of enforcement (CIM) tend to grow faster and to exhibit higher **[outcome: investment rate]** (positive association).
9	Clarke (2001)	Investment in R&D pays off over long periods, requiring 'assurances' about getting investment and returns back. Other things equal, weaker rule of law will depress investments in R&D	52 developed, middle- and low-income countries, between 1983 and 1994	Countries with weaker institutions tend to have lower **[outcome: R&D expenditures]** than countries with stronger institutions (positive association)
10	Commander and Tinn (2008)	Not stated	Countries. It is not clear how many countries were included in the regressions Data on contract enforcement is based on World Bank's 2003 'Doing Business' survey	There is a weak association (correlation) between investment and contract enforcement. **[outcome: Gross fixed capital formation to GDP]**

N.	Authors	Mechanism	Context	Outcome
12	Cungu and Swinnen (2003)	Weak third-party enforcement encourages payment delays ('hold-up' and breach of contract), which deter firms' expansion plans. Hold-up can affect investment directly (affecting cash flow) or indirectly (recognition of hold-up potential and uncertainty in investment decisions)	Hungary in transition (firms surveyed in 1998) Agricultural enterprises that contract production to processing firms	Legal enforcement is not directly associated with investment but there is a significant negative indirect association with contract breach problems (i.e. positive indirect association between contract enforcement and investment) **[outcome: ratio of investment to capital stock]**
13	Dao (2008)	General remark on quality of institutions, uncertainty and investment to justify empirical exercise	36 developing countries Country-level surveys of business people, and economic performance 2001-04	Share of senior managers that rank 'courts and dispute resolution systems' as a major or very severe constraint is associated as predicted with the gross investment rate (i.e. positive indirect association between contract enforcement and investment) **[outcome: investment rate]**
15	Le (2000)	In profit-maximising framework, equilibrium investment rates depend on return differential (investment's vs minimum-risk US Treasury Bills), economic risk, socio-political instability, regime change instability, policy uncertainty (including variability in contract enforcement), and risk aversion	25 developing countries between 1975 and 1995	Contract enforcement indicator positively associated with investment rate; variance of the indicator ambiguously related to investment (conflicting results) **[outcome: rate of private investment]**

N.	Authors	Mechanism	Context	Outcome
16	Levine (1998)	Better contract enforcement facilitates banking development, and this favours investment	43 countries that were European colonies Data for 1975-93	(Exogenous) legal origin has an effect on the legal codes defining creditor rights and the efficiency of the legal system in enforcing those codes. These allow the exogenous component of banking development to be distinguished, and this component is shown to have a positive effect on capital accumulation (and growth) **[outcome: growth of per capita stock of capital]**
17	Lin et al. (2010)	'Enforcements provide necessary protection to the fruits of R&D (patent, copyrights, trademarks, etc.)'. 'Contract enforcements protect investments that are complementary to R&D expenditures, especially during the post-R&D stage, and hence help realize the commercial values of R&D' (p.50). 'An effective legal system to protect property rights and enforce contracts will facilitate business operations and hence help promote R&D investment.' (p.51)	Over 2,400 firms in 18 Chinese cities Data from a 2003 World Bank survey	'Contract enforcement promotes R&D investment, as indicated by the positive and statistically significant coefficients of contract and contract upheld. Firm managers who express greater faith that their rights will be protected by the contract and upheld by the legal system tend to invest more in R&D projects.' **[outcome: R&D spending as a percentage of total sales]**

N.	Authors	Mechanism	Context	Outcome
18	Long (2010)	'As the economy grows larger and more sophisticated, uniform and impersonal enforcement of rules is needed to regulate more complex transactions' (p.647). This contributes to the rise of investment and growth of firms	1,500 Chinese firms. Firms come from five cities (four major coastal cities and a major inland economic hub, Chengdu) and 10 sectors (five each in manufacturing and services) Year 2000	'A higher proportion of business disputes settled through the court system is correlated with a higher investment rate' (p. 646) **[outcome: ratio between investment made in the year 2000 and total fixed assets in 1999]**
19	Pang and Wu (2009)	Better contract enforcement leads to more efficient capital allocation by reducing (capital) adjustment costs, benefiting in particular 'contract-intensive industries'	923 industry-country observations, for 1963-2002 Data on enforcement ranges from 1998-2007	Better contract enforcement is positively associated with more efficient investment (i.e. greater investment when/where there are better growth prospects) **[outcome: industrial value-added elasticity of investment]**
20	Poirson (1998)	'Improvements in economic security contribute to the rise of private investment by decreasing downside uncertainty on the return to investment' (p. 4)	53 developing countries Over 1980-1995	Ambiguous effect, one indicator of enforcement (RULAW) not significant, other (REPUCON) significantly associated with investment **[outcome: investment rate]**
21	Prados de la Escosura and Sanz-Villarroy (2009)	General remark on quality of institutions, uncertainty and investment to justify empirical exercise	Argentina over 1875-2000	Positive association between indicator of contract enforcement and investment **[outcome: investment rate]**

N.	Authors	Mechanism	Context	Outcome
22	Raja and Schaefer (2007)	When enforcement of contracts is less effective, the probability of breach of contracts is higher affecting decisions about the size of raw and finished goods inventories, since the latter are accumulated to act as a buffer against the hazards of transacting in the market in a weak legal environment	378 firm-level observations across 14 comparable products and 39 developed and developing countries. Years covered are 1997 to 2003.	Index reflecting quality of contract enforcement positively associated with ratio of total inventories to net sales **[outcome: ratio of total inventories to GDP]**

The authors of this report were supported by the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) and the International Initiative for Impact Evaluation (3ie).

The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) is part of the Social Science Research Unit (SSRU), Institute of Education, University of London.

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This material has been funded by the Department for International Development. However the views expressed do not necessarily reflect the department's official policies. The report was first published in 2012 by:

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ISBN: 978-1-907345-41-8
Cover image ©Trevor Samson/The World Bank

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