Relational Contracts and Development[*]

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Abstract

This article reviews an emerging body of evidence on relational contracts, defined as informal arrangements sustained by the value of future interactions. We focus on developing countries and international markets, which are often characterized as contexts with weak formal contract enforcement. We introduce relational contracting between firms as a governance form alternative to both firms and markets. We then review evidence on the prevalence of long-term relationships between firms and discuss why this governance form might be particularly common in developing countries. After introducing a simple framework, we discuss the measurement of relational contracting between firms. We review an approach that takes dynamic incentive compatibility constraints to the data to quantify the value of future interactions and illustrate how different types of shocks can be used to uncover the inner functioning of relational contracting. We also review structural models and conclude with policy implications and promising avenues for future research

Key Words: Governance Forms, Relational Contracts, Trust, Organizational Economics, Development Economics.

Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence (p357, Arrow 1972).

1. INTRODUCTION

Real-life transactions, even elementary ones, expose parties to opportunism. Although legal enforcement is often unavailable or impractical, parties typically refrain from acting opportunistically. Many scholars have thus postulated that social attitudes such as trust are key for economic development (Banfield 1958; Gambetta 1988; Guiso et al. 2004, 2009).[2] The Oxford dictionary defines trust as the "firm belief in the reliability, truth, or ability of someone or something." Economists have captured this notion through two distinct but complementary frameworks. One view, supported by a vast experimental literature, postulates that people often cooperate and expect others to behave fairly and to reciprocate, even in one-shot interactions. A second view, rooted in repeated game theory, formalizes trust as beliefs about the likelihood that other players will cooperate due to strategic motives.

Being trusting is indeed not always optimal, particularly when contract enforcement institutions are underdeveloped.[3] In such contexts, parties might rely upon relationships with people they trust to carry out their transactions (Greif, 2006). It is thus important to understand how trust, or lack thereof, impacts actual transactions; how relationships based on trust are established and function; and how they alter market functioning. Answering these and related questions is necessary to understand the mechanisms involved and to formulate concrete policy recommendations.

Long-term relationships based on trust have indeed been documented in many settings and have spurred a vast literature. Macaulay (1963) was perhaps the first to study noncontractual relations between businesses. Following Baker et al. (2002), we refer to those arrangements as relational contracts—defined as "informal agreements sustained by the value of future relationships." According to the same authors,

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A relational contract thus allows the parties to utilize their detailed knowledge of their specific situation and to adapt to new information as it becomes available. For the same reasons, however, relational contracts cannot be enforced by a third party and so must be self-enforcing: the value of the future relationship must be sufficiently large that neither party wishes to renege (p40, Baker et al., 2002).

This article reviews an emerging body of empirical work on relational contracts between firms. We mainly focus on developing countries and international markets. While there is a natural motivation to focus on such contexts because of weak contract enforcement institutions, the definition above suggests that there is no reason these issues should not be common in other markets more generally; relational contracts between firms, indeed, are important in advanced economies as well.[4]

The empirical study of relational contracting is somewhat complicated by the fact that the value of future relationships is typically not observed in the data. For this reason, most of the existing literature studies repeated, long-term relationships between firms and uses the repeated nature of transactions observed in the data as a proxy for relational contracting. We thus often simply refer to long-term relationships (henceforth, LTRs) when discussing the empirical evidence.

Dynamic incentive compatibility constraints (DICCs) underpin models of relational contracting: The emphasis on the role of the value of future relationships in deterring opportunism distinguishes merely repeated trade from relational trade. We review an approach that explicitly takes DICCs to the data. The main insight is that measures of, and exogenous shocks to, temptations to deviate allow, through revealed preference arguments, to quantify the value of relationships and to uncover the inner functioning of the underlying relational contract.

This approach can be applied to other contexts in which relationships are important. For instance, DICCs underpin theoretical models of cartels and collusive behavior. For brevity, we can only mention points of contact and selected studies rather than reviewing the literature. Similarly, relational contracts are widespread within firms as well (Baker et al., 2002; Gibbons & Henderson, 2012). The nature of interactions within firms, however, makes it harder to observe temptations to deviate and therefore apply the approach. For this reason, we focus on

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[4] Readers may consult, for example, Corts & Singh (2004) and Calzolari et al. (2021) on relationships in US offshore drilling and German auto industries, respectively; and Gil et al. (2022) and Barron et al. (2020) on relational adaptation in US airline and Spanish movie distribution. Lafontaine & Slade (2007), MacLeod (2007) and Gil & Zanarone (2016, 2017) provide reviews.

interactions between firms and mention only a few selected studies on relational contracts within firms.

The rest of the article unfolds as follows. Section 2 introduces LTRs between firms as a governance form alternative to both firms and markets. It then reviews evidence that LTRs account for a large share of transactions between firms in many contexts and discusses why they might be particularly prevalent in developing countries. Finally, this section places the study of LTRs within the context of the literature on firms in developing countries. Section 3 reviews empirical approaches that explicitly focus on DICCs. After introducing a simple framework and terminology, we discuss measurement challenges, introduce an approach that takes DICCs to the data, and review contributions that use structural models. Section 4 discusses the implications of LTRs for market structure, sourcing systems and firms' boundaries, and for interactions within firms. Finally, Section 5 discusses avenues for future research and the policy implications of this agenda.[5]

2. WHY STUDY RELATIONSHIPS? WHY IN DEVELOPING COUNTRIES?

2.1. Markets, Firms, and Long-Term Relationships

Our point of departure is to consider relationships within the broader context of how economic transactions are governed. Williamson (2005) distinguishes three main governance forms: the market, the firm, and long-term relationships (LTRs).[6] The market is most familiar: Prices allocate resources and govern adaptation by coordinating the decentralized choices of anonymous parties that interact through short-term enforceable contracts. At the other extreme, firms are also familiar: Hierarchies replace prices as the mechanisms through which resources are allocated and adaptation needs are met. In between markets and firms sits a variety of intermediate (hybrid) governance forms of which LTRs are perhaps the most important case. In such relationships, parties rely upon detailed knowledge of their specific situation to adapt to new circumstances. For this reason, these relational contracts cannot be enforced by a third party and must be self-enforcing.

Are relationships temporary arrangements destined to dissolve into either markets or firms,

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[5] Atkin & Khandelval (2020), Antràs & Chor (2021), and Verhoogen (2021) provide complementary reviews in international trade and development. Space limitation prevent us from discussing state and nonstate institutions that provide contract enforcement (see, e.g., Gambetta, 1993; Dixit, 2003).

[6] In Williamson's (2005, p.1) words, "The object is to work out the efficiency logic for managing transactions by alternative modes of governance - principally spot markets, various long-term contracts (hybrids), and hierarchies."

or do they represent a stable governance form?[7] Although a definitive quantification is not available, relationships are relevant in many contexts. In the United States—the market economy par excellence—census data reveal that transactions between firms account for about half of value added in the private sector (La Fontaine & Slade, 2007). But how are these transactions structured? Answering this question requires information on the identity of trading parties that are typically unavailable from census data. Other data must be used.

Customs data that identify trading parties have become available in recent years. Monarch & Schmidt-Eisenlohr (2020, unpublished manuscript) find that 80% of US imports occur in preexisting relationships. Although the majority of relationships are newly formed, in any given year preexisting relationships that are 3 or more years old account for roughly half of the imports. Other data confirm the importance of relationships in international trade.[8]

International trade entails greater distance and more severe information and contracting problems. To the extent that LTRs are used to attenuate these frictions, customs data might overstate the importance of LTRs relative to domestic transactions. Value-added tax (VAT) records tracking firm-to-firm transactions in the domestic economy have become available for several countries and can generate systematic facts on the prevalence of LTRs.[9]

Regulated industries provide a further source of data. In the Peruvian anchovy fishery industry, roughly 60% of the fish is sourced by vertically integrated plants that own boats, 30% by plants and boats in LTRs, and only 10% by plants and boats that have sporadic interactions (Martinez-Carrasco, 2017; Hansman et al., 2020). In the Costa Rica coffee chain, around 40% of the coffee is intermediated by vertically integrated chains in which exporters own processing mills, 40% by exporters and mills that have relationships of 3 years or more, and the remaining 20% by exporters and mills that trade less than three consecutive seasons (Macchiavello & Miquel-Florensa, 2016). Transaction cost economic theories à la Williamson predict that vertical integration and LTRs are more likely for complex and specific products. This

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[7] Williamson (1985, p. 83) states, "Whereas I was earlier on the view that transactions on the middle range…were very difficult to organize and hence unstable…I am now persuaded that…[they] are much more common.". Ronald Coase – perhaps the founding father of transaction cost economics – suggested that such hybrids "might represent the dominant form of doing business" (p.346, Menard, 2004).

[8] Readers are referred to Martin et al. (2020) for the case of France, Macchiavello (2010) for Chilean wine exports, Macchiavello & Morjaria (2015) for Kenyan cut flower exports, and Cajal-Grossi et al. (2022) for exports of Bangladeshi garments.

[9] VAT data have been used in Belgium (Dhyne et al., 2015), Chile (Huneeus, 2018), Costa Rica (Alfaro-Urena et al., 2019), the Dominican Republic (Cardoza et al., 2020), Ecuador (Adao et al. 2020), Turkey (Demir et al. 2021), Uganda and Rwanda (Spray 2021), and India (Gadenne et al., 2019). Whereas these data were originally used in public finance, recent studies have focused on firm-to-firm networks, diffusion of shocks, and spillovers. For other sources of data, readers may consult Carvalho et al. (2021) for Japan and Barrot & Sauvagnat (2016) for the United States.

hypothesis has received extensive empirical support (see Monteverde & Teece, 1982; Masten, 1984). Fish and coffee might provide a lower bound to the prevalence of vertical integration and relationships.

In sum, many—and perhaps most—transactions between firms occur in LTRs rather than in spot markets, as typically theorized in economic models. Understanding LTRs becomes crucial for fields as diverse as industrial organization (do they favor anticompetitive practices?), international macro and trade (do they alter the transmission of shocks across borders?), and corporate finance (do they support trade credit?).

2.2. Long-Term Relationships and Development Economics

Understanding LTRs between firms is important for development economics as well. There are both conceptual and methodological reasons.

From a conceptual point of view, the two main alternative governance forms to relationships—the market and the firm—are quite dysfunctional in developing countries. If markets do not function well and firms struggle to grow and expand, LTRs might account for a particularly large share of transactions in developing countries.

A central tenet of modern development economics is that markets do not function well: Failures in, for example, financial and labor markets can account for why poor individuals behave differently from the predictions of classical economics (Schultz, 1964). When exchanging products, even simple ones, parties might obviate poorly functioning markets by bundling their transaction with the exchange of inputs and services. This increases parties' exposure to each other's opportunism. As "*fiat is frequently…more efficient…than… haggling*" (p.114, Williamson 1971), one would imagine that parties could deal with this problem by bringing the transaction within the firm. Firms in developing countries, however, are also poorly managed (Bloom & Van Reenen, 2010) and face barriers to growth and expansion (Hsieh & Klenow, 2014; Hsieh & Olken, 2014). The main alternative to the market is thus also not available; the need to bundle simple transactions with the exchange of inputs and services then increases the demand for LTRs in developing countries.[10]

LTRs might thus be particularly prevalent in developing countries not (only, or mainly) because courts are less functioning and contracts are harder to enforce, but (also) because of market failures and limits to firms' growth. This hypothesis, however, must be qualified in at least two ways. First, market failures and their underlying causes might also reduce the supply

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[10] Readers are referred to the literature on interlinked transactions (Bardhan, 1991) and to Bauer's (1954) and Fafchamps's (2003) analysis of markets in Sub-Saharan Africa.

of relationships. For example, underdeveloped financial markets could make it harder for parties to withstand shocks and sustain relationships. Second, the choices of governance forms interact in equilibrium. For example, Kranton (1996) develops a model in which markets based on spot-transactions substitute for bilateral LTRs. Choices of governance forms are strategic complements: The more parties participate in market exchange, the harder it is to sustain LTRs (and, therefore, the higher the incentives to participate in market exchange). This is an argument reminiscent of Polanyi's (1947) great transformation from nonmarket to market-based societies. Other interactions are however possible; markets and LTRs could also be strategic substitutes.

Methodologically, the study of LTRs (and, more broadly, of organizational forms) presents mutual benefits for both organizational and development economists. For development economists, a deeper understanding of governance choices provides a lens to understand misallocation and constraints to firm growth, and it can help identify underlying market failures and improve policy design in specific contexts. For organizational economists, market failures and the resulting organizational responses are starker in developing countries. With underdeveloped markets, relatively simple transactions allow to isolate confounding factors and cleanly test theoretical predictions. As a case in point, agricultural markets feature prominently in this review not only because of the disproportionately high share of employment in the sector in developing countries, but also because they offer relatively simple transactions that allow to focus attention on the underlying contracting problems.

2.3. Relationship with Existing Literature on Firms in Development Economics

We briefly review the literature on firms in developing countries and how it relates to the study of governance forms. Earlier contributions mostly focused on understanding productivity, entry and exit flows, and participation in international trade. More recently, cross-country differences in misallocation (Hsieh & Klenow, 2009) and management practices (Bloom & Van Reenen, 2010) have revived interest in firms in developing countries. De Mel et al. (2008) introduced the use of randomized controlled trials (RCTs) to study microenterprises, the dominant type of firms in developing countries (see Quinn & Woodruff (2019) for a review).

These agendas have, by and large, not included the choice of governance forms (including LTRs) in their lines of inquiry. Notable exceptions include work by Woodruff (2002) on vertical integration in the Mexican footwear industry; by Banerjee & Munshi (in the unpublished version of their 2004 article) on capital misallocation in the Tirupur garment hub; by Andrabi et al. (2006) on flexible specialization of a large tractors manufacturer in Pakistan;

and by [Iyer & Schoar (2015)](#) on experimental audit studies on hold-ups and renegotiations among shop owners in India. Closer to this review are the studies by [McMillan & Woodruff (1999)](#) on LTRs between firms and trade credit in Vietnam and by [Banerjee & Duflo (2000)](#) on reputation in the software industry in India. In international markets, [Macchiavello (2010)](#) studies LTRs between Chilean wine exporters and UK distributors, and [Antras & Foley (2015)](#) investigate the choice of trade finance terms using data on LTRs between a US exporter of frozen products and its distributors oversea.

3. TAKING DYNAMIC INCENTIVE COMPATIBILITY CONSTRAINTS TO THE DATA

This section reviews recent studies that take DICCs to the data. We first provide a conceptual framework to clarify terminology and notation. We then discuss measurement challenges, and we review an approach that relies on direct measures of temptations to deviate, as well as contributions that estimate structural models. The next section considers applications; policy implications are discussed in the conclusions.

3.1. Conceptual Framework

Consider an infinitely repeated prisoner's dilemma between two symmetric players with common discount factor δ. Denote with C, D, and P the payoffs associated with cooperation, defection (when the opponent cooperates), and punishment (i.e., mutual defection) in the stage game, respectively. Assuming for a moment that a defection is followed by punishment forever, a condition for cooperation is given by

$$C + \frac{\delta}{1-\delta} C \geq D + \frac{\delta}{1-\delta} P , \qquad (1)$$

which can be rewritten as

$$V \equiv \frac{\delta}{1-\delta}(C-P) \geq D - C. \qquad (2)$$

The DICC in Equation 2 captures the tension between current temptations and future rewards that is at the core of repeated-game models of LTR. The right-hand side is the temptation to deviate—the short-run gain associated with opportunistic behavior. The left-hand side is the value of the relationship—the discounted future payoff associated with maintaining a good relationship instead of switching to a punishment phase. In the words of [Baker et al. (2002)](#), p.40, "the value of the future relationship must be sufficiently large that neither party

wishes to renege." This value is a key object of interest; for ease of exposition, let us denote it **V**.[11]

The framework has been extended to capture salient features of real-life LTRs: The literature has introduced transfers between parties, imperfect information, and incentive and risk-sharing considerations. Reputational concerns, in the form of asymmetric information and/or uncertainty over players' types, have also been considered.[12]

While these models differ in important respects, they share the common insight embedded in DICC: The future value of the relationship **V** pins down the extent to which parties can expose themselves to opportunism. The DICC thus lies at the heart of the empirical contributions reviewed below. In its reduced-form representation, the relationship value **V** could include payoffs associated with cultural and psychological factors and formal enforcement, when available. From an empirical standpoint, this is a convenient formulation. Before moving on, however, it is worth noting that the DICC provides an incomplete characterization of trust underpinning relationships: It characterizes conditions that are necessary, but not sufficient, for a self-enforcing relationship to emerge. Empirically, there might be cases in which DICC is satisfied, yet LTRs fail to emerge. We return to this issue in the last section.

3.2. Measuring Relational Contracts

Taking DICC to the data poses a number of challenges. Existing data sets reveal, at best, whether parties trade repeatedly with each other, but they do not contain information on whether parties rely on credible promises of future rents to discipline behavior. Much of the literature, including the papers reviewed above, therefore use measures of relationships' age (either in calendar time or in the number of previous interactions) to identify relationships. This is a limitation, because repeated trade does not imply relational trade.

Relational trade can be proxied building upon the predictions of theoretical models. For example, Taylor & Wiggins (1997) use relational contracting in bundle with other practices, for example, frequent and smaller shipments. When these practices are observable in the data, they can be used to construct empirical proxies for relational trade (see Heise et al., 2019; Cajal-Grossi et al., 2022).

A distinct approach is to measure relational contracting directly through surveys. Relational

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[11] In this simple framework there is no loss in assuming that parties respond to defection by reverting to the worst equilibrium, since defection never occurs in equilibrium. This is no longer true in more general models.
[12] Mailath & Samuelson (2006), Malcomson (2012), and Watson (2021) provide excellent reviews.

contracts allow parties to utilize knowledge of their specific situation and are deeply rooted in the parties' specific circumstances. The measurement of relational contracts thus requires a detailed understanding of the setting, and survey tools should be tailored to the relevant relational practices. It might be difficult to measure relational contracting across a wide range of industries using a standardized survey tool. Within-industry studies can measure relational practices, exploring drivers of adoption and their relation to performance (see Macchiavello & Morjaria, 2021 for an example).[13]

3.3. The Value of Relationships

The key difficulty in taking DICCs to the data is that neither the left-hand side nor the right-hand side of Equation 2 are observed. The temptation to deviate on the right-hand side depends on off-the-equilibrium-path payoffs associated with defection. By definition, off-the-equilibrium-path actions are not meant to be observed in the data. Similarly, the relationship value V on the left-hand side depends, inter alia, on discount rates that are difficult to estimate and on beliefs about other players' future behaviors on and off the equilibrium path. Those, too, are typically unobserved.[14]

The central idea of Macchiavello & Morjaria (2015) is that much can be learned if temptations to deviate are directly observed in the data. At a minimum, temptations to deviate identify lower bounds to relationship value V. With further structure and in combination with shocks, however, DICCs allow to distinguish between competing models and to uncover the nature of the underlying relational contract.[15]

The paper studies the export of roses from Kenya. Because the flowers are highly perishable and fragile, parties are exposed to opportunism: the seller might not deliver flowers reliably, and/or the buyer could claim that flowers did not arrive in the right conditions and withhold payment. It would be difficult for a court to adjudicate in such cases—a problem exacerbated by the international nature of the transaction. Consequently, flowers are exported through two channels: auctions in the Netherlands and LTRs with foreign buyers. These channels have similar logistics but differ in terms of contractual arrangements. The auctions provide contract enforcement: Flowers are inspected and graded, buyers bid for flowers, and payments are enforced before the flowers are transferred to the buyers. Using the auctions incurs higher transport costs (the flower makes a longer journey through the Netherlands) and fees, and it

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[13] Natural and controlled experiments can also be used to identify relational contracting (see examples below).

[14] These challenges apply more broadly to the estimation of dynamic games (see Aguirregabiria et al. 2021).

[15] Readers may consult Gil et al. (2022) and Barron et al. (2020) for applications of this insight.

prevents buyers and sellers from agreeing on long-term plans. Direct trade with foreign buyers avoids these problems but exposes parties to opportunism.[16]

Consider a buyer and a seller who have agreed to trade a certain quantity q of roses at price p. What do cooperation and defection mean in this context? Cooperation presumably entails that the seller delivers the flowers as agreed, and the buyer pays the corresponding amount upon receiving the flowers. The buyer could defect by withholding the promised payment.[17] The seller could defect in many ways. A particular way is by selling the roses promised to the buyer at the auctions for a price p^w. The incentive compatibility constraints for the seller and the buyer are respectively given by

$$V^s \geq \left(p^w - p\right)q \text{ and } V^b \geq pq. \quad (3)$$

The key observation is that both temptations to deviate are directly observed in the data: They depend on observed trade between parties (p and q) and on prevailing prices at the auctions (p^w). Under certain conditions (see, e.g., Malcomson, 2012), the two DICCs can be aggregated, and the relational contract can be sustained if

$$V \geq p^w q. \quad (4)$$

The value of the relationship $V = V^s + V^b$ has to be larger than that of the flowers valued at the auction price. The quantity $p^w q$ thus provides a lower bound to relationship value V.

The model in the paper provides guidance on how to make further progress. Prices at the auctions fluctuate seasonally but are predictable: Parties thus structure their relationship taking into account such fluctuations. The DICC at the time of the largest aggregate temptation to deviate provides the tightest bound to V. For most relationships, the Valentine's week is the time in which the temptation to deviate is largest, both because prices at the auctions are highest and because parties increase traded volumes to meet the demand peak.

A structural test reveals that DICC is binding, and therefore the value of flowers at the auctions traded in the relationship during Valentine's week identifies the relationship value V.[18] Estimated Vs are 384% of weekly turnover in the average relationship (270% and 161% for the average buyer and seller, respectively). Under free entry, the rents required to sustain

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[16] Buyers and sellers rarely write contracts, and when they do, they do not expect those to be enforced in courts.

[17] Anticipating payment before delivery simply shifts the incentive problem to the seller.

[18] If small fluctuations in p^w do not change V, a binding DICC implies $\partial \ln\left(q\right)/\partial p^w = -1$ in the week in which the temptation is largest and not in other weeks. This hypothesis is not rejected by the data.

relationships are dissipated through initial sunk-cost investments. Estimated relationship value **V** can be benchmarked against estimates of the fixed costs of exporting. Relative to such benchmark, estimated **V** appear to be substantial. Large, estimated **V**s do not imply a well-functioning market: To the contrary, many valuable relationships likely do not take place because they are not sufficiently valuable to overcome temptations to deviate.

Estimated **V** increases with relationship's age. Whereas this is to some extent driven by selection (as less valuable relationships are less likely to survive into the following season), **V** increases as parties interact more. Note that the bulk of the variation in estimated relationship values **V** stems from variation in the amount of flowers traded on Valentine's Day. In this context, this is the relevant dimension that captures how parties expose themselves to opportunism. In other contexts, the observable terms that might evolve with relationship's age will differ. For example, in Macchiavello's (2010) work the price increases as the seller establishes a better record; in Macchiavello & Miquel-Florensa's (2016) paper, demand assurance concerns imply that prices decrease over the course of the relationship; and in Antras & Foley's (2015) and Blouin & Macchiavello's (2019) studies, financing and contracting terms evolve over the course of the relationship. Detailed institutional knowledge of the context is needed to capture the salient aspects of the underlying relational contract.

Models with enforcement constraints between risk-neutral parties with deep pockets imply a stationary (optimal) subgame perfect equilibrium and are thus rejected by the evidence that **V** increases with relationship's age. Responses to an unanticipated shock help distinguishing between models in the (still) large class featuring nonstationary equilibria. Due to an intense episode of ethnic violence, many sellers were not able to harvest all the flowers promised to the buyers. The data reveal an inverted-U pattern between relationship's age and reliability during the violence. This pattern is best accounted for by a relational contract in which exporters build a reputation for reliability: Young relationships are not yet sufficiently valuable to be prioritized, whereas in old relationships the exporters' reliability has already been proven. Middle-aged relationships are valuable and are prioritized during the supply shock, as the seller is still trying to prove their reliability. Enforcement and insurance considerations alone cannot account for the evidence.[19]

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[19] Ksoll et al. (2021) study the violence in greater detail. On the supply side, the violence reduced exports primarily through workers' absence with larger firms and those exporting through LTRs suffering smaller production and losses of workers. On the demand side, global buyers were unable to shift sourcing to Kenyan exporters located in areas not directly affected by the violence or to neighbouring Ethiopian suppliers. Consistent with difficulties in insuring against supply-chain risk disruptions caused by electoral violence, the authors find that firms in direct contractual relationships ramped up shipments immediately prior to the subsequent 2013 presidential election to mitigate risk.

3.4. Detecting Opportunism

In most models, parties do not engage in opportunistic behavior on-the-equilibrium path: the relationship value **V** deters parties from behaving opportunistically. To what extent is this true in practice? Detecting opportunistic behavior is challenging. First, transaction data typically do not contain information about contractual defaults. Transaction data record the trade that takes place, not the trade that *was supposed* to take place. Second, there is an identification challenge: it is difficult to distinguish whether observed contractual defaults happen because the defaulting party cannot comply with the contract or whether instead it doesn't want to comply knowing that it can get away with it – a situation which we label strategic default.[20]

Blouin & Macchiavello (2019) identify strategic default in the international coffee market. They analyze a data set comprising about 800 forward-sale agreements involving over 300 exporters located in 21 developing countries.[21] The data contain information on the underlying commercial contract (the trade that is supposed to happen) and on the actual transaction (the trade that does happen). Defaults are thus observed in the data. The test builds on the insight that parties behave opportunistically when unforeseen changes in circumstances place the business relationship outside its self-enforcing range—i.e., when the temptation to renege becomes too large relative to the available relational value **V** (Klein, 1996).

Two forms of forward contracts are observed. The buyer and the exporter can agree on a fixed-price contract or on a price-indexed contract, in which case the final price is the prevailing world price p^w at the delivery date, plus a differential premium Δ agreed at the contracting date. Denoting with p^c the price in the contract, we have $p^c = p^f$ in the case of a fixed-price contract and $p^c = p^w + \Delta$ in the case of A differential contract. The exporter's DICC is

$$V^s \geq \left(p^w - p^c \right) q^c. \qquad (5)$$

This DICC reveals that a sufficiently large unanticipated increase in the world price p^w triggers a default on fixed-price contracts but not on differential-price contracts. A challenge is that parties' expectations at the contracting stage are typically unobserved. Contract-specific

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[20] Strategic default is a form of ex-post moral hazard. For example, in credit markets ex-post moral hazard refers to the borrower defaulting even if they have funds to repay, and ex-ante moral hazard refers to the borrower exerting insufficient effort or diverting funds. A similar distinction can be drawn for commercial transactions (distinguishing side selling from shirking on costs). It is potentially important to distinguish between ex-ante and ex-post moral hazards, as they (*a*) require different contractual remedies, (*b*) are differentially influenced by changes in the environment (calling for different risk-assessment models), and (*c*) have different legal and welfare implications. Chiappori & Salanie (2003) advance similar arguments on sources of asymmetric information.

[21] In forward sale contracts – which are common in many industries, particularly in commodities – parties agree at a certain contracting date for the delivery of a certain amount of commodity at a future delivery date.

measures of price surprises are constructed exploiting coffee's futures prices to proxy for parties' expectations at the contracting stage. The data reveal that contractual defaults on fixed-price contracts—but not on differential-price contracts—are more likely after large positive price surprises.[22]

Although contractual defaults are relatively rare in the data, ≈50% of observed defaults are strategic in nature. Strategic default is thus a concrete possibility in this market. How do parties react to this possibility? Strategic default introduces a trade-off between price risk and counterparty risk: A price-indexed contract foregoes price insurance but is not subject to the risk of strategic default. Relationships with higher **V** have lower risk of default. This implies that fixed-price contracts are more likely to be agreed on in relationships that are more valuable. Using relationship's age as a proxy for **V** finds empirical support for this prediction in the data. This implies the counterintuitive implication that strategic default is detected on relatively more valuable relationships that afford fixed-price contracts. Strategic default, however, imposes larger costs on exporters that sign differential contracts to avoid strategic default in equilibrium.

Blouin & Macchiavello (2019) calibrate the model and recover estimates of the relationship value **V** for each contract in the data. As in Macchiavello & Morjaria's (2015) article, estimated **V**s are large. Relative to a first-best scenario in which contracts are perfectly enforced, output is 16% lower for the average exporter due to the possibility of strategic default. This translates into lower purchases and lower prices paid to farmers upstream. Exporters face heterogeneous missing markets: Some are insured against risk but are credit constrained, others are insurance constrained, and some are both.[23]

3.5. Structural Approaches

Estimating structural models of contracting problems and relationships allows to quantify welfare losses and perform counterfactuals to evaluate alternative contractual arrangements and policies. This is a promising avenue for research.

Galenianos & Gavazza (2017) estimate a model of the illicit drug market—by definition a context without formal contract enforcement. Drug dealers face a trade-off between short-term

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[22] A typical difficulty in identifying strategic default is that negative shocks drive both the ability to fulfil contractual obligations and the incentives to strategically default (see, e.g., Guiso et al. 2013). An appealing feature of this test is that the likelihood of default increases after a positive price shock. A potential confounder is the possibility that higher p^w increases the cost of raw material purchased from farmers and induces the exporter to default through this alternative channel. The test holds using price increases after payments to farmers are completed.

[23] Empirical strategies analogous to the ones in this article have been deployed to study how commodity price booms influence expropriation risk and contract choices between governments and multinationals in natural resources. Stroebel & Van Benthem (2013) provide an empirical study and further references.

opportunism (cheat the client today) and the long-term value of building relationships with clients. The model also allows for search frictions. The framework allows to evaluate the effectiveness of policies (e.g., legalization and increase of penalties) and provides an ideal canvas upon which to build empirical models that quantify contracting problems in developing countries and in international markets.

Startz (2021) estimates search and contracting frictions among Nigerian importers of consumers' goods. The paper combines original surveys and structural estimation. The author exploits the observation that traders can avoid both search frictions and contracting problems by traveling to purchase goods in the exporting market in person. Removing both search and contracting frictions would increase welfare from the traded consumer goods sector by 14%. Without frictions, importing traders' profits are higher but average importer size decreases. Information frictions thus push the smallest firms out of the market.[24]

Two recent contributions in the industrial organization literature are particularly relevant for the approach reviewed above. Ryan (2020) studies the consequences of lack of contract enforcement in the procurement of large power projects in India. Renegotiation of contracts in response to cost shocks is widespread (although bidders are allowed to bid cost-indexed contracts). Firms connected to the auctioneer index less of the value of their bids and expose themselves to the cost shock to induce renegotiation. Bidders that are able to extract higher payments during the renegotiation process bid to offer power below cost, as they expect value later in renegotiation. The estimates reveal that many contracts are awarded to high-cost producers that can extract more in the renegotiation phase; perfectly enforced contracts would reduce markups and reallocate projects toward more efficient producers.

Igami & Sugaya (2021) estimate a repeated-game model of the international vitamin cartels. They structurally estimate the cartel's DICC; this allows them to disentangle various factors that affect the sustainability of collusion and investigate whether a merger might facilitate collusion through counterfactual analysis.

4. APPLICATIONS OF DYNAMIC INCENTIVE CONSTRAINTS

This section discusses how the empirical focus on DICCs can be used to explore the connection between LTRs and market structure, sourcing systems, firm's boundaries, and within-firm

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[24] Bai (2018) combines an RCT with structural techniques to study information frictions in urban markets for watermelons in China—a context with asymmetric information about quality and a lack of quality premium at baseline. A laser-branding technology introduced experimentally induced sellers to provide higher quality. After the intervention, however, markets reverted back to the baseline.

interactions.

4.1. Relationships and Market Structure

Markets in which relationships are important might behave differently from the predictions of models that assume enforceable contracts. There has been a surge in interest in understanding competition in developing countries (see, e.g., Atkin & Donaldson, 2016; Bergquist & Dinerstein, 2020; Zavala, 2021; Rubens, 2021) Under standard forms of competition (i.e., without incentive constraints), the pass-through of cost shocks to prices can reveal market power distortions and expose how surplus is distributed across market participants. For example, with knowledge of the demand's curvature, pass-through rates can be used to infer conduct.

When contracts are not enforceable, however, additional considerations come into play. For example, Emran et al. (2021) study the effects of a ban on intermediaries in the edible oil supply chain in Bangladesh. Many models of oligopolistic competition imply that removing a layer of intermediaries increases the pass-through rate of imported crude oil price. In contrast, the ban decreased the pass-through rate (and increased downstream prices) because intermediaries acted as suppliers of trade credit to downstream wholesalers and retailers. Casaburi & Reed (2022) experimentally subsidize traders buying cocoa from farmers in Sierra Leone and find that the subsidy is partly passed through to farmers through enhanced credit provision. In this case, the price pass-through fails to capture the mechanisms and extent of price shocks transmission.

LTRs also provide a differentiation strategy through which firms compete. Ghani & Reed (2022) study how relational arrangements evolve in response to a change in competition in the market between ice retailers and fishing boats in Sierra Leone. When supply from the monopolist ice manufacturer is scarce, ice retailers prioritize deliveries to their most loyal clients. The entry of a second ice manufacturer increases supply and temporarily destabilizes preexisting LTRs. To retain clients, incumbent ice retailers establish new relational arrangements in which they expand the trade credit offered to the most loyal clients. Via this channel, higher competition upstream generates productivity gains downstream. This margin of adjustment, however, is unavailable to new retailers without a track record.

Markets in which relationships are important might also differ in the way they react to increased competition. In general, competition improves market functioning through selection (i.e., only the most productive firms survive) and/or by incentivizing firms to improve management and productivity (see Holmes & Schmitz, 2010 for a review). As noted above,

however, LTRs rely on future rents to sustain cooperation. If competition erodes these rents, it could have undesired consequences on market functioning. The impact of competition thus provides a key comparative static to understand whether markets in which LTRs are important behave differently from markets with enforceable contracts.

Macchiavello & Morjaria (2021) tackle this question in the Rwanda Coffee Sector, an industry in which smallholder farmers supply coffee cherries to approximately 200 mills. The article measures the use of relational contracts in the industry through a detailed survey of both mills and (a random sample of) farmers. Due to multiple market imperfections, it is mutually beneficial for mills and farmers to exchange coffee through LTRs in which mills and farmers bundle trade in coffee cherries with credit provisions in both directions. Such transactions, however, expose parties to opportunism and thus require rents to be sustained. Because coffee cherries must be processed within hours of harvest, mills are scattered around rural areas and, due to high transport costs, compete in relatively localized markets. These markets exogenously differ in their suitability for mill entry, allowing the construction of an instrument for competition. Competition has a negative impact on the use of relational contracts between mills and farmers. The breakdown in relational contracts lowers mills' efficiency and output quality. More surprisingly, competition lowers the aggregate amount of coffee supplied by farmers to any mill without increasing prices—and thus it also likely makes farmers worse off.

Brugués (2020) studies the interaction between imperfect contract enforcement and market power in the textile, pharmaceutical, and cement sectors in Ecuador. Unlike the studies reviewed above, this paper estimates a dynamic nonlinear pricing model in which sellers commit to dynamic contracts while buyers can default on trade-credit debt without incurring legal penalties. To provide dynamic incentives to buyers, trade is inefficiently low in early periods but converges toward efficiency as relationships age despite sellers' market power. A counterfactual analysis reveals that both sellers' market power and limited enforcement contribute to inefficiencies. Addressing either friction alone, however, leads to welfare losses: A certain degree of market power is needed to provide incentives for debt repayment; imperfect enforcement limits sellers' exercise of market power.

Imperfect contract enforcement can create barriers to entry and reduce competition. Casaburi & Macchiavello (2019) provide evidence of such mechanism by studying the demand and supply of infrequent payments in the Kenya dairy sector. When market participants lack access to adequate saving tools, due either to underdevelopment of the financial system or to intrapersonal biases (Bryan et al. 2010), infrequent payments for good or services sold, like

monthly paid wages, can help market participants reach saving goals.[25] Infrequent payments, however, create a temptation to deviate for the buyer: After the employee has worked, or the farmer has delivered milk, for the month, the buyer might be tempted to renege on the due payment. In the Kenya dairy study, two experiments confirm (*a*) farmers' demand for infrequent payment offered by a large buyer and (*b*) small buyers' inability to credibly supply infrequent payments. A market structure emerges in which buyers that are sufficiently credible to offer infrequent payments pay low prices for milk, exploiting their market power in the lucrative market for infrequent payments.

A second issue in this area is that LTRs can also sustain undesirable forms of cooperation, such as collusive agreements (see Asker & Nocke, 2021 for a review). Chassang & Ortner (2019) provide a vivid illustration studying public procurement auctions in Japan. The DICC associated with collusive behavior implies that introducing minimum prices can lower winning bids. This (counterintuitive) prediction is due to the fact that minimum bidding prices weaken cartels by limiting the scope for punishment. A difference-in-differences analysis exploiting the introduction of minimum prices in some cities has borne out the prediction in the data and provides a test for collusive behavior based on DICC.

Espinosa et al. (2021) test for informal collusive arrangement in the Colombia energy market. The industry regulator increased the delay with which participants' bids would be disclosed to market participants—a change in transparency that increases temptations to deviate (by making them harder to detect) and can thus lead to the violation of DICCs required to sustain a cartel. Bids from certain firms dropped immediately after the policy was announced, more than a month before the regulation came into play. This is consistent with the idea that the announcement of the future change in policy led to a drop in the future relationship value **V** (as opposed to a change in current circumstances), unraveling the collusive arrangement. As noted above, Igami & Sugaya (2021) provide a further example of the benefits of taking DICCs directly to the data to better understand cartels. Understanding how LTRs support collusion in developing countries is a priority area for research.

4.2. Sourcing Strategies and Suppliers' Upgrading

A firm's approach to sourcing is a key strategic decision, and particularly so in volatile contexts such as international sourcing from developing countries: Buyers may find it difficult to secure quality products, obtain reliable deliveries, or ensure social and environmental compliance.

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[25] Brune et al. (2021) provide experimental evidence.

Buyers from richer countries can be particularly risk averse and demand delivery standards not easily attainable by suppliers in least developed countries. Unlike local buyers, that can rely on informal networks to detect and punish cheating suppliers, foreign buyers might not be able to distinguish defaults due to unfavorable shocks from supplier's cheating, and they have high opportunity cost of resources—e.g., time, inventories, and brand reputation (Banerjee, 2006).

Two polar approaches to sourcing can be distinguished (Taylor & Wiggins, 1997). At one extreme, buyers may pursue a spot-sourcing strategy in which short-term orders are allocated to the lowest bidders and the buyer bears the costs of noncompliance. At the other extreme, buyers may adopt a relational sourcing strategy in which orders are allocated to few suppliers with whom the buyer develops LTRs. Under spot sourcing, suppliers' margins are squeezed by intense competition; under relational sourcing, higher markups might be used to incentivize suppliers to deliver on aspects that are difficult to contract upon. A buyer's approach to sourcing can thus be a key dimension of upgrading for firms in least developed countries. Cajal-Grossi et al. (2022) take advantage of customs data and internal records from garment factories to compare suppliers' margins across orders produced for buyers with different sourcing strategies in the Bangladeshi garment sector. They find that Bangladeshi exporters earn higher margins on orders produced for relational buyers compared to spot buyers.[26]

Responsible and sustainable sourcing practices have come to the forefront of practitioners' and policy makers' attention in recent years (see Dragusanu et al., 2014 for a survey of fair trade and Alfonso-Urena et al., 2021 for a recent theoretical and quantitative assessment). Aspects of quality such as workers' health and safety conditions, the payment of fair prices to smallholder farmers, and the absence of child labor and environmental degradation (e.g., deforestation) in a buyer's supply chain are particularly difficult to monitor and contract upon. A relational approach to sourcing might thus be particularly important in such contexts. Amengual & Distelhorst (2020) examine the impact of a change in the global sourcing approach at Gap Inc. on suppliers' compliance. Using a regression discontinuity design, the paper estimates the causal effects of compliance ratings on suppliers' social compliance. When the buyer incorporated penalties in the form of threats from the sourcing department to discontinue the business relationship with noncompliant suppliers, a failing grade caused factory compliance to improve significantly. No such effect was found in the absence of termination threat. Boudreau (2020) provides an RCT evaluation of an initiative led by

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[26] Unlike in the studies reviewed above, here the approach to sourcing is assumed to be a characteristic of the buyer—rather than of the relationship. We return to this distinction in the next section.

international buyers aimed at enforcing a mandate for worker-manager safety committees in Bangladeshi garment factories. Besides the intrinsic interest of the study, this paper is one of the very first RCTs involving (a consortium of) large buyers in a global supply chain—a type of collaboration and research approach we hope to see more often in the future.

Macchiavello & Miquel-Florensa (2019) study the Sustainable Quality Program in the Colombia coffee chain. The program is designed, and implemented on behalf, of a large multinational buyer (henceforth: the Buyer) of high-quality coffee. The program can be understood as a vertical restraint in which the relational contract between the Buyer and the local exporter specifies the usual terms of trade at the export gate as well as a premium to be paid to participating farmers upon delivery of coffee of adequate quality. The paper calibrates the DICC underpinning the program to (*a*) structurally test for the vertical restraint and (*b*) perform counterfactual analysis. Without the relational rents provided by the relationship with the Buyer, the exporter would not be able to credibly pay a farm gate premium to induce farmers to invest and upgrade quality.

The study provides a vivid example of how a multinational's capabilities to develop and sustain relational contracts with suppliers is a key driver of upgrading and increases in farmers' incomes. In this context, the relational rents are used to correct market failures (market power and limited contract enforcement) in the domestic supply chain. Understanding the transfers of capabilities within LTRs, and how those interact with relational contracting, is an important area for work. Kellogg (2011) offers an example of how LTRs facilitate interorganizational learning, and Alfaro-Ureña et al. (2022) provide an evaluation of suppliers' upgrading from multinationals sourcing in Costa Rica.

4.3. Firms' Boundaries and Vertical Integration

Since Coase's (1937) seminal study, contractual problems have been at the heart of theories of the firm (see, e.g., Gibbons, 2005). One might imagine that vertical integration (henceforth, VI) would be particularly prevalent in developing countries, since contracting problems are generally perceived to be more severe there. The evidence does not support this intuition, however: Once industry effects are accounted for, there does not appear to be a correlation between VI and the level of development (see, e.g., Acemoglu et al. 2009, Macchiavello 2012). LTRs between firms, however, can also mitigate those contracting problems. A complete understanding of firms' decision to integrate vertically and of how firms' boundaries matter, then, calls for a comparison of the transactions taking place within integrated firms with those taking place in LTRs.

Macchiavello & Miquel-Florensa (2016) provide such comparison in the context of the Costa Rica coffee chain. They show that trade under VI and LTRs is indeed relatively similar and very distinct from market transactions. This suggests that the two governance forms deal with similar contracting problems. The paper, however, also uncovers a discontinuity in the scale of operations at the firm's boundary. The volume of trade that can be supported under LTRs is limited by the possibility that the supplier might default on promised deliveries should better trading opportunities arise. By shifting ownership of the coffee away from the supplier, (backward) VI removes such temptations and allows parties to transact volumes beyond the critical size. This provides a test of Baker et al.'s (2002) model, in which the choice of firm's boundaries alters parties' temptations to renege on the relational contract. VI, however, comes at the cost of making it more difficult to develop and sustain relationships with other parties, which is necessary due to uncertainty in demand and supply. A calibration of the DICC reveals that choosing the correct organizational form is worth 10% of profits at the average firm.

Firms' boundaries impact other important margins of interest to development economists. For instance, Brandt et al. (2022) study productivity differences in vertically integrated steel facilities in China. Vertical integration is associated with differences in productivity at different stages of the chain: Private firms outperform in producing pig iron and in steelmaking but lag in sintering, possibly due to worse access to raw materials. Hansman et al. (2020) find that quality upgrading is an important motive for integrating suppliers in the Peruvian fish meal manufacturing chain. They show that processing plants integrate boats when the quality premium rises for exogenous reasons, and, conversely, suppliers change behavior to increase quality when owned by downstream plants. More work is needed to understand the drivers (and consequences) of firms' boundary decisions in developing countries and how they interact with LTRs. For instance, it would be important to extend the industrial organization literature on the anticompetitive effects of vertical integration to consider LTRs (see Crawford et al., 2018; Bresnahan and Levin, 2012).

Relationships between horizontally competing firms are not necessarily harmful to market functioning, however. Bassi et al. (2021a) study the rental market for machines among small and medium-sized enterprises (SMEs) in informal clusters in Uganda. Rental market interactions allow small firms to increase their effective scale and mechanize production, even when each individual firm would be too small to invest in expensive machines. The rental market is quantitatively important and, once taken into account, implies a firm's size distribution (now measured by the number of workers using a machine) that is substantially less skewed than revealed by the more standard counting of employees. The study focuses on

a sector, wood carpentry, for which contracting problems in equipment rental are limited. LTRs thus do not appear to play an important role. It would be important to assess the extent to which rental markets and other forms of interfirm cooperation, possibly supported by LTRs, are relevant in other contexts.[27]

4.4. Remarks on Within-Firm Relationships

Relational contracts are widespread within firms as well (Baker et al., 2002; Gibbons & Henderson, 2012). A large literature studies human resource practices within firms (see Gibbons & Roberts, 2013 for reviews). The empirical literature on relational contracts within firms is however somewhat less developed than the literature on between-firm arrangements. Transactions within firms are typically not recorded in data sets available to researchers, and temptations to deviate are harder to observe. Within-firm DICCs are thus (even more) difficult to take to the data.

A few recent contributions study relationships within firms in developing countries.[28] Adhvaryu et al. (2020a) study how managers in Indian apparel factories rely on relational contracts to cope with frequent worker absenteeism shocks. Managers respond to shocks by lending and borrowing workers in a manner consistent with relational contracting, but many beneficial transfers remain unrealized. Akerlof et al. (2020) infer the importance of relationships studying how workers in a large Bangladeshi sweater factory responded to management's decision to lay off about a quarter of the workers following a period of labor unrest. The firing of peers with whom workers had social connections resulted in a large and persistent reduction in the productivity of surviving workers. A portrait of the firm emerges as a web of interconnected relational agreements supported by social connections. Relatedly, Adhvaryu et al. (2020b) show experimentally that enabling workers to express discontent improves worker retention and effort (see also Cai & Wang 2020 for a related experiment). Atkin et al. (2017) show that the lack of well-functioning relationships between managers and cutters prevented technology adoption in a cluster of soccer-ball producers in Pakistan. Macchiavello et al. (2020) find that misaligned beliefs across hierarchical layers, which likely

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[27] Given the importance of agriculture and smallholder farmers in developing countries, cooperatives—an organizational form in which the firm is collectively owned by the farmers—are an especially important organizational form. For example, it would be important to understand how the joint owner-supplier nature of the relationships between the farmer and the cooperative affects both the farmers and the firm. Banerjee et al. (2001) and Montero (2022) provide illuminating studies of cooperatives in Maharashtra and Central America, respectively.

[28] Blader et al. (2015, 2020) report results from field experiments on driver productivity within a large US logistics company demonstrating that relational contracts have a sizeable effect on productivity and can be changed by management.

prevent well-functioning relationships, stifle promotion of female workers to middle-managerial roles in Bangladeshi garment factories.

More work is needed to understand the role that relational contracts play within firms in developing countries. Informality is a defining characteristic of labor markets in developing countries (see Ulyssea (2020) for a review); most employer-employee relationships are thus informal and based on trust. For example, through a novel experiment in Ghana, Caria & Falco (2020) show that low trust in workers discourages small businesses from hiring.[29] Studying DICCs in such contexts has the potential to enhance our understanding of the limits to firms' growth and specialization in developing countries.

5. CONCLUSIONS

A body of evidence on relational contracts between firms is emerging. While there is a natural motivation to focus on developing countries and international markets because of their weak contract enforcement institutions, there is no reason that lessons learned in these contexts could not apply more broadly, in advanced economies as well. We have reviewed evidence on the prevalence of LTRs between firms; discussed measurement challenges and provided a conceptual framework to take DICCs to the data; and reviewed applications of the framework, including to market structure and firm boundaries. The agenda is still in its infancy. We thus highlight promising areas for future research, besides those already mentioned above.

5.1. The Aggregate Impact of Dynamic Incentive Compatibility Constraints

The studies reviewed above focused on specific industries. Detailed contextual knowledge allows for a vivid illustration of the salient contracting problems and for precise measurement. This approach, however, comes with certain limitations. As usual with empirical approaches based on case studies, it is important to consider the generalizability of the findings. The emphasis in this review has been on testing theoretical hypotheses through empirical approaches that can be taken to other contexts.

An approach based on case studies prevents an analysis of the aggregate significance of contracting problems. This is potentially a significant limitation. For example, once we abandon a world with perfectly enforced contracts, it is hard to know whether the observed amount of relationships is (constrained) efficient or not. On the one hand, there might be too few LTRs. For instance, Munshi (2011) finds that networks that support their members can

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[29] Generalized trust correlates with firms' size (La Porta et al. 1997) and decentralization (Bloom et al. 2012). Readers are referred to Keefer & Scartascini (2022) for a review as well as original evidence.

substitute for inherited human capital and wealth. Supporting the formation of LTRs might thus expand economic opportunities. On the other hand, LTRs might function precisely by excluding other market participants from the network—in which case, LTRs might worsen selection and lead to misallocation. Organized crime groups offer a case in point (Gambetta, 1993; Dixit, 2003): The contract enforcement they provide through LTRs (and the threat of violence) is beneficial to the organization's members but detrimental in aggregate (Pinotti, 2015).

Furthermore, precisely because transacting parties can overcome contracting problems through an adequate choice of governance forms (including LTRs), the aggregate costs associated with contracting frictions might be limited. Within a cross-country empirical framework, Acemoglu & Johnson (2005) disentangle the impact of contracting problems and limited property rights enforcement on aggregate income and productivity. They find evidence that poor property right protection has a negative effect on economic development whereas poor contracting institutions do not, perhaps because of parties' ability to overcome contracting problems through other arrangements, such as LTRs. The evidence and empirical approach reviewed in this paper should thus be integrated into studies that model and structurally estimate contracting frictions across industries and work out aggregate implications. Bohem & Oberfield (2020) provide an excellent example. New empirical frameworks are needed to evaluate the a priori ambiguous net effect of LTRs in equilibrium.

5.2. Foundations of Dynamic Incentive Compatibility Constraints and Organizational Capabilities

The DICC provides an incomplete characterization of trust in LTRs: It focuses on the credibility of a self-enforcing arrangement, but it does not illuminate how parties build, or coordinate on, the equilibrium. Even in the simple repeated prisoner's dilemma described above, there always exists an equilibrium in which parties do not cooperate: If one party expects the other to defect no matter what, then the optimal response is indeed to defect (and vice versa). Indeed, the experimental literature in the lab has found that, although cooperation is indeed more likely to arise when the DICC can be satisfied, observed cooperation is much lower than predicted (Dal Bó & Fréchette, 2018).

First, the equilibrium in which parties cooperate entails an element of trust—at the minimum, trust that the other party understands and plays the equilibrium. The evidence from the lab suggests indeed that cooperation is significantly more likely to emerge when it is robust

to strategic uncertainty.[30] Furthermore, standard models of relational contracting assume that parties have a "shared understanding of the parties' role in and rewards from collaborating together" (p. 5, Gibbons, 2021).[31] In Gibbons & Henderson's (2012) terminology, the DICC captures the credibility of self-enforcing relational contracts but omits the clarity that underpins such arrangements. Gibbons (2021), p.13, notes that "the theoretical literature has developed great expertise on the credibility problem but essentially ignored the clarity problem." Necessarily then, the same can be said of the empirical literature: As the relevant theoretical literature progresses, developing empirical approaches to understand the clarity problem is an important area for research. This could be done in different ways.

The literature on cartels provides examples in which efforts to build clarity are directly observed. Detailed notes from the weekly meetings of the sugar-refining cartel allow Genesove & Mullin (2001) to establish the critical role played by communication. Meetings were used to interpret and adapt the agreement, coordinate actions, and determine whether cheating had occurred. Byrne & DeRoos (2019) document equilibrium selection in the retail gasoline industry. Dominant firms create focal points to facilitate price coordination and experiment with prices to test rivals' willingness to coordinate and to create a mutual understanding of a coordinated pricing strategy among firms.

An alternative route is to use surveys to measure shared understanding in the LTRs. Casaburi & Macchiavello (2015) report the case of a Kenyan dairy cooperative in which lack of clarity among members hampered the organization's attempts to curb side-selling. Many farmers believed the cooperative should not sanction members that would side-sell, despite explicit bylaws stating the opposite. Relative to farmers who supported the sanctions, those who did not had lower trust toward co-op board members (but not toward other co-op members nor lower generic trust).

Gibbons et al. (2020) design a novel experiment to understand whether basing a relational contract on general principles (rather than on specific rules) yields better coordination, and they implement a nudge treatment to foster the adoption of principle-based relational contracts. The nudge caused more pairs to articulate principles but failed to increase performance, as parties did not follow the principles they agreed upon.

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[30] Strategic uncertainty implies that the off-the-equilibrium path payoff that a party obtains should the other party deviate also enters the decision to cooperate or not. This is more demanding in terms of required data.
[31] While it is not always possible to perfectly observe whether a party has cooperated or not---and this of course matters for equilibrium---at least parties agree on what those actions means. Chassang (2010) develops a model in which the details of cooperation are not common knowledge, and agents with conflicting interests learn to cooperate over time.

This highlights how well-functioning relational contracts may be difficult to build in practice—an observation that calls for more work to understand the organizational capabilities that underpin relational contracting. The management literature and numerous case studies argue that firms need to develop certain capabilities, possibly through investments and organizational changes, to be able to implement relational contracts (see Helper & Henderson, 2014). For example, the literature has discussed how the practical implementation of US and Japanese supply-chain management of procurement systems relies on different organizational practices (Sako & Helper, 1998). If organizational capabilities, as opposed to the transaction costs associated with the specific part or context, are a key driver of sourcing strategy choices, then buyers' identity should be a key driver of how transactions are organized. The buyer's dummy is indeed a key driver of whether a part is produced in-house or not in Monteverde & Teece's (1982) classic test of transaction cost economics (TCE) (see Helper & Munasib, 2021) for a similar test using US customs data on the imports of car parts).

Cajal-Grossi et al. (2022) quantify the importance of organizational drivers of sourcing strategies among international buyers of garments. They first introduce an empirical measure that captures how relational a sourcing strategy is and then present an empirical test that is inspired by, and generalizes, the Monteverde & Teece's (1982) finding reported above. In a relational sourcing strategy, buyers concentrate a given volume of orders in relatively few suppliers. The (negative of the) ratio between the number of suppliers and the number of transactions can thus be used as an empirical proxy for how much the buyer relies on a relational strategy when sourcing a certain product from a certain country. Using transaction level data with buyers' and sellers' identities from multiple countries, they show that buyers' sourcing strategies are positively correlated across countries: For example, H&M is one of the most relational buyers in all products and countries it sources from in the sample. Standard TCE theories suggest that the choice of sourcing strategy should be mainly driven by product characteristics and conditions in the sourcing market. In contrast, buyer effects account for over 40% of the explained variation in sourcing strategies, more than twice the amount of variation explained by product-country of origin and product-country of destination effects.

The importance of the organizational capabilities that underpin relational contracts has practical policy relevance. Because relational contracts are mutual understandings rooted in the parties' specific circumstances, a policy maker in a developing country cannot easily improve relationships between, say, exporters and their foreign buyers. If certain buyers possess organizational capabilities that make them reliable relational partners, however, it becomes feasible (at least in theory) to design policies that attract such buyers. Furthermore, many

supply chains in developing countries are characterized by few large firms interacting with many small suppliers and/or customers (e.g., agricultural supply chains that aggregate produces from smallholder farmers). The organizational capabilities required to develop and sustain relational contracts with such populations, often characterized by low general trust and education levels, might be fundamentally different from those required to develop relationships in other contexts.

These considerations also bring us back to the literature on cultural norms and trust we started with and suggest that understanding when LTRs fail to emerge is an important area for future work. Bubb et al. (2016) find that limited enforcement of water transactions causes significant output losses between neighboring farmers in rural India. Using an ingenious experimental design, the authors show that farmers living next to each other, with plenty of opportunities to interact repeatedly, fail to develop well-functioning relational contracts. This is not always the case (see Wade, 1989 and Haseeb, 2020 on water management). Blouin (2022) combines lab-in-the-field and historical experiments and shows that a negative interethnic history between Hutu and Tutsi in Rwanda and Burundi lowers trust and LTR formation between farmers. Differences in cultural norms might thus lead to different informal institutions to cope with contracting problems.

An important question is thus the extent to which the degree of generalized trust in society increases or not the prevalence of relational contracting. On the one hand, generalized trust could increase the "supply" of relational contracts – e.g., by inducing more optimistic beliefs about a counter-party's trustworthiness and encouraging trying out new relationships. This intuition, however, might not provide the full picture. First, a certain degree of pessimism about alternative trading opportunities is necessary to sustain cooperation (see Ghosh & Ray, 1996; Sugaya & Wolitzky, 2021). Second, generalized trust might also lower the "demand" for relational contracts -- if counter-parties can be trusted even in one-shot transactions, there is less of a need to establish long-term relational arrangements.[32]

A further intriguing question is whether interventions aimed at increasing trust work. In an experiment that organized business associations for Chinese SMEs, Cai & Szeidl (2018) find positive impacts on business outcomes. Although the intervention did not target trust, it might

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[32] More broadly, if one interprets culture as shared cognition, cultural homogeneity could reduce strategic uncertainty and foster clarity in LTRs. A view of culture as shared cognition can be fruitfully applied to organizations as well. Gibbons et al. (2021) provide such a model and explore how common frames link organizational culture and performance. On both one-short and repeated interactions, common frames can either increase or decrease performance. Gibbons and Prusak (2020) provide a related discussion on the role of narratives in forming organizational culture.

have worked through that channel, too.

5.3. Policy Implications

The DICC provides a useful lens to understand multiple facets of market functioning in developing countries. Contracting problems create sizeable inefficiencies and contribute to resource misallocation. Whereas this is expected for small firms, our review has uncovered constraints on large firms as well. Although more work is needed, certain policy-relevant themes begin to emerge from this agenda. We highlight few selected ideas and refer to the individual studies for more detailed discussion.

Improving the functioning of courts is often not immediately feasible. Thus, there is a need to increase contract enforcement in specific settings. In many contexts, industry regulators can play an active role. For example, the Costa Rica coffee regulator (ICAFE) enforces contracts between farmers and mills and between mills and exporters. It might be possible for other regulators to emulate the successful experience of ICAFE. Such interventions must be evaluated on a case-by-case basis since partial improvements in contract enforcement could undermine relationships and alter the distribution of rents along the chain. Further research is needed to understand how to improve contract enforcement in specific contexts.

If seller's reputation—intended as posterior beliefs—is an important driver of success in export markets, informational externalities that justify policy intervention arise. A logical implication of reputation as posterior beliefs is that prior beliefs matter. By definition, prior beliefs are the result of experiences with other exporters or stereotypes. Bai et al. (2021) demonstrate the importance of such collective reputation forces (Tirole, 1996) exploiting a large contamination scandal in the Chinese diary sector. They find that the revenues of noncontaminated firms dropped significantly as a result of the scandal. Firms deemed innocent by government inspections suffered as much as non-inspected firms; younger firms (presumably with less of a track record) also suffered more.

Governments could provide information on market participants and their behaviors (e.g., through credit registry or through a registry of commercial disputes) and/or subsidize information acquisition about local firms (e.g., through initial guarantee schemes). It is however important to stress that, in a second-best world, well-intended interventions might backfire. For example, if information frictions generate rents needed to overcome other contracting problems, more transparency might undermine market functioning. Similarly, more information can enable firms to collude. The growth of e-platforms and the increasing adoption

of digital technology in supply chain also yield promise.[33] In contexts characterized by small firms and smallholder farmers, however, last-mile challenges are likely paramount. Digital platforms and technology also raise regulatory considerations with respect to anticompetitive practices.

The evaluation of policies to ameliorate contracting problems and support well-functioning relationships is an important area for work.

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[33] On the one hand, rating mechanisms and escrow services often used on E-platforms improve transparency and trust (see, e.g., Chen and Xu, 2021). On the other hand, low entry costs can induce excessive entry and increase search costs (e.g., Bai et al., 2020).

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