Relational Contracts: Recent Empirical Advancements and Open Questions*

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Abstract

Relational contracts − informal self-enforcing agreements sustained by repeated interactions − are ubiquitous both within and across organizational boundaries. This review highlights recent empirical contributions in selected areas. We begin by reviewing some recent work that explicitly takes the dynamic enforcement constraints that underpin relational contract models to the data. We then discuss the relationship between relational contracting and firms' performance. We conclude pointing in directions that we consider to be particularly ripe for future work.

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1 Introduction

Relational contracts – informal arrangements sustained by the value of future interactions – appear to be ubiquitous both within and across organizational boundaries. This paper provides a selective review of some recent empirical contributions on the study of relational contracts and discusses a few promising avenues for future research. Fortunately for us, many excellent reviews of the literature exist – even an overview of the existing reviews is necessarily selective. Besides the contributions in this volume, and with a primarily theoretical focus, reviews include MacLeod (2007), the Handbook of Organizational Economics chapter by Malcomson (2012), the comprehensive textbook on repeated games by Mailath and Samuelson (2006) and more recently, Watson (2021). In an earlier survey of the literature, MacLeod (2007) discusses the importance of transaction costs (or the "quality of the legal environment") for determining the choice between formal and informal contracts and highlights the role of "reputational capital" for contract enforcement. His paper also discusses empirical contributions (e.g., Greif (1993), Banerjee and Duflo (2000) and McMillan and Woodruff (1999)) and their relationship with theories. On the empirical front, Shelanski and Klein (1995); Lafontaine and Slade (2007, 2012); Gil and Zanarone (2016, 2018) review empirical evidence on relational contracting.

Macchiavello (2022) provides a review of the relational contracts literature and is complementary to this paper. He focuses on how the study of relational contracting can improve our understanding of market failures and institutions in developing countries. Our exposition of the conceptual framework in Section 2 builds on Macchiavello and Morjaria (2015) and Macchiavello (2022). Many of the contributions reviewed here are also mentioned in Macchiavello (2022). There are, however, some notable differences. This paper is not exclusively focused on contributions from developing economies, it presents in greater detail some of the papers we have authored including anecdotes that – while important – would be hard to discuss in literature reviews intended to be more comprehensive, and it also more explicitly speculates about avenues for future work that we regard as being particularly promising.[1]

Standing on the shoulders of this comprehensive body of work, we begin by highlighting dynamic enforcement constraints – and the associated concepts of *relationship value* and *temptations to deviate* – as constitutive features of relational contracts. This leads us to review empirical contributions that explicitly take these dynamic enforcement constraints to the data. Both *relationship value* and *temptations to deviate* are not directly observed and thus pose a challenge to test the theory. The main idea behind the approach we review is to construct empirical proxies for, or look for exogenous shocks to, *temptations to deviate* in order to learn the source of, and quantify, *relationship value*.

This special edition features contributions by Bentley and Jim characterizing relational contracts

[1] Macchiavello and Morjaria (2022b) also borrows the conceptual framework from Macchiavello and Morjaria (2015), but doesn't provide as a detailed review of the literature as we do here and, instead, presents original evidence on the relationship between measures of relational contracting and measures of both bilateral and generalized trust. Also with a focus on developing countries, Fafchamps (2004) provides a fascinating early account of informal relationships in Sub-Saharan African markets through enterprise surveys.

in a market framework, and the emphasis on internal labor markets and relational adaptation by Bob, George and Kevin. With regards to the two different perspectives in this volume, we mainly focus on relational contracts *between* organizations. While we are guilty of omissions on many other fronts – if pressed to highlight one, we would confess our discomfort with the scant attention we devote to relational contracts *within* firms. It is tempting to appeal to space constraints as an excuse. The matter of fact is that the nature of within-firm interactions makes it harder to construct empirical proxies for *temptations to deviate* and thus pursue the approach reviewed here to learn about relational contracts within firms.[2] Yet, our fieldwork in low-income countries – where self-employment in micro-enterprises is the most common form of employment – convinced us that understanding constraints to build relational contracts provides a lens on the paucity of larger organizations and lower aggregate productivity in developing countries. We thus highlight this as one of the more promising area for future work. We highlight other areas where future work would be valuable: (1) how relational contracting influences firms' performance, and (2) how organizational capabilities (at the micro-level, i.e., organizational *c*ulture to use Bob's terminology elsewhere) and institutional capabilities (at the macro-level, but intended to include *C*ulture as well) underpin relational contracts.

2 Taking Dynamic Enforcement Constraints to the Data

Dynamic Enforcement Constraints. Relational contracts are informal arrangements sustained by the value of future interactions (MacLeod and Malcomson, 1989; Levin, 2003). In the words of (Baker et al., 2002, p. 40), in order for a relational agreement to be sustainable "*the value of the future relationship must be sufficiently large that neither party wishes to renege*". There are two distinct approaches to think about relational contracts: via repeated game theory (Telser, 1980), or via asymmetric information on persistent types (Kreps et al., 1982). There are also models that combine the two, e.g., Halac (2012). Empirical scholars at times use different terminologies to refer to the same models and, conversely, the same words when actually referring to different concepts. At the time of our PhD at LSE, Luís Cabral had posted lecture notes which we found very useful for the empirically minded researcher.[3] He referred to the first approach as formalizing "trust", while the second "reputation". For simplicity, we will stick to this terminology.

The distinction matters empirically. The repeated game model relies upon self-enforcing norms of behavior, while in the types approach there is no notion of a behavioral norm – Bayes rule provides sufficient guidance to pin down players' beliefs and guide their actions as a function of observed outcomes. We return to this distinction when we describe in detail Macchiavello and Morjaria (2015).

To fix ideas, it is useful to start from what probably is the simplest model of cooperation

[2] There have been recent empirical contribution on relational contracts within firms – see, e.g., Blader et al. (2019), Akerlof et al. (2020) and Adhvaryu et al. (2021) – and we mention those when appropriate.

[3] *The Economics of Trust and Reputation: A Primer*, https://pages.stern.nyu.edu/~lcabral/reputation/Reputation_June05.pdf

sustained by the value of future interactions: the repeated prisoner dilemma. Two symmetric players have a common discount factor δ. Let us define the actions and, with an abuse of notation, the associated pay-offs in the stage game as follows: each player can cooperate or defect, if both cooperate they each receive a payoff of C (*cooperation*). If both decide to defect, each receives a payoff P (*punishment*). If one party defects and the other cooperates, the defecting party earns D (*defection*) and the other party earns Z. As is standard, assume $D > C > P > Z$. Consider a grim like strategy where parties cooperate and defection is punished by permanent mutual defection in the future. Then the condition to sustain a cooperative equilibrium is:

$$C + \frac{\delta}{1-\delta} C \geq D + \frac{\delta}{1-\delta} P. \tag{1}$$

This can be reorganized to

$$\underbrace{\frac{\delta}{(1-\delta)}(C-P)}_{\textit{Value of the Relationship}} \quad \geq \quad \underbrace{D-C}_{\textit{Temptation to Deviate}} \tag{2}$$

To the applied researcher, this simple reorganization has a powerful intuitive appeal.[4] The right-hand side represents the *temptation to deviate* – the amount that parties stand to gain from reneging on the informal agreement, $(D-C)$. The left-hand side, is the *Value of the Relationship* – the difference between the present discounted value along the equilibrium path (i.e., if parties keep cooperating) and the present discounted value off-the-equilibrium path (i.e., following a deviation). For ease of exposition, we will denote $\mathbf{V} = \frac{C-P}{(1-\delta)}$. Put another way, the dynamic enforcement (henceforth DE) constraint in equation (2) captures the core tension between current short-opportunism temptations that parties face and the future rewards gained if they maintain a cooperative relationship. Although the framework has been extended to capture many salient features of commercial and social long-term relationships – for instance transfers between parties, imperfect information, incentives, risk sharing, reputational concerns and/or uncertainty over players' types – this tension lies at the core of repeated game models of long-term relationships: the future value of the relationship $\mathbf{V}$ pins down the extent to which parties can expose themselves to short-term opportunism.

Before we turn to how to take the DE constraint to data, it is worth noting that the DE constraint provides an incomplete characterization of trust underpinning relationships – for at least two reasons. First, researchers who start from the surplus condition (2) – including ourselves – often fail to discuss that the equilibrium requires the existence of a set of self-enforcing social norms. Thus, while (2) provides necessary and sufficient condition to study a self-enforcing arrangement in the data, it *presumes* the existence of social norms (Akerlof, 1980). Second, the DE constraint focuses

[4] MacLeod and Malcomson (1989) established that (2) yields both a necessary and sufficient condition for the optimal SPE to be self-enforcing. It is worth noting that, at the time MacLeod and Malcomson (1989) was published, it was not yet known how to characterize equilibria in a repeated game. Establishing that (2) provides necessary and sufficient conditions for the existence of a relational contract was thus the key contribution of MacLeod and Malcomson (1989), see MacLeod and Malcomson (2023) for additional details. The contribution was later generalized to the case with moral hazard and (non-persistent) adverse selection by Levin (2003).

on the credibility of the optimal self-enforcing arrangement, without saying much on how parties build, or coordinate on, that equilibrium. We perhaps do not have good theories of equilibrium selection and, therefore, this is not something that the empirical literature has carefully considered either. Empirically, there might be cases in which DE constraint is satisfied, yet relational contracts fail to emerge. Indeed, this is a common finding in the literature that tests repeated game models with experiments in the lab (see Dal Bó and Fréchette (2018) for a state of the art review). While many studies confirm that cooperation is indeed more likely to arise when DE constraint is satisfied, the amount of cooperation generally observed is much lower than what would be predicted by the theory. First, even in the simple repeated prisoner 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, than the optimal response is indeed to defect (and vice versa). A notable feature of the DE constraint is that it does not depend on S – the payoff in the stage-game that a player gets from cooperating when the other player defects. Intuition would instead suggest that – in the presence of strategic uncertainty – a player would be less likely to cooperate if S is sufficiently low relative to P. The equilibrium in which parties cooperate thus entails an element of trust – at the minimum, trust that the other party understands and plays the equilibrium. Furthermore, standard models of relational contracting assume that parties have a "*shared understanding of the parties' role in and rewards from collaborating together*" (Gibbons (2022)). In Gibbons and Henderson (2012b)'s terminology, DE constraint captures the *credibility* of self-enforcing relational contracts, but omits – or rather, assumes – the *clarity* that underpins such arrangements.

Taking DE constraint to the Data. Despite these conceptual limitations, DE constraint provides a natural starting point from which to explore relational contracts in the data. Inconveniently, at least from the perspective of the empirical researcher, neither the left-hand side nor the right-hand side of equation (2) are observed in standard datasets. 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 occur in reality, let alone be observed in the data. Similarly, the relationship value $\mathbf{V}$ on the left-hand side depends, *inter alia*, on discount rates that are difficult to estimate and on beliefs about other players' future behaviour on- and off-the equilibrium path. Those are also typically unobserved in standard datasets. As noted by Gil and Zanarone (2017), these conceptual difficulties compound other measurement challenges due to the difficulty in gathering contextual evidence on whether relational contracts are being used and why and the indirect, hard-to-measure, nature of what the relational contract is about.

While we return to those challenges in the next Section, we note that a convenient feature of the DE constraint is that the reduced-form representation of the relationship value $\mathbf{V}$ can potentially include payoffs associated with cultural and psychological factors and formal enforcement (when available). From an empirical standpoint, this offers a potentially and convenient characterization and a path to test ideas from theory.

The Value of Relationships. The central idea in Macchiavello and Morjaria (2015) is that much can be learned if temptations to deviate (the right-hand side of DE constraint) are directly observed in the data. At a minimum, temptations to deviate identify lower bounds to relationship value $\mathbf{V}$. With further structure and in combination with shocks, however, DE constraint allows to distinguish between competing models and uncover the nature of the underlying relational contract.

The paper studies the export of roses from Kenya. A key vantage point from the DE constraint perspective is the coexistence of relational contracts alongside a well-functioning spot market – the *Flower Auction* – which allows to directly measure temptations to deviate. Transactions of flowers – which are highly perishable and fragile – leave parties exposed to opportunism: the seller might not deliver flowers reliably and/or the buyer could claim that flowers did not arrive in the appropriate conditions and withhold payment while the seller could always claim otherwise. It would be difficult for a third-party, for instance a court, to adjudicate in such cases – a problem exacerbated by the international nature of the transaction. Hence there is scope for trade to be governed by relational contracts.

Consequently, flowers are exported through two market channels: the *Flower Auction* in the Netherlands and direct long-term relationships with global buyers. These distributions channels have similar transportation logistics but differ in terms of contractual arrangements between the exporter and global buyer. The *Flower Auction* however provides institutional support for contract enforcement: flowers are inspected and graded, buyers bid for flowers, delivery is guaranteed and payments are enforced before the flowers are transferred to the buyers. Using the *Flower Auctions* incurs higher transport costs (the shipment travels a substantial distance to the Netherlands), various handling fees, and prevents buyers and sellers to agree on long-term plans. Direct trade with foreign buyers on the other hand bypasses these costs and constraints but exposes parties to short-run opportunism and contracting challenges.

To fix ideas, consider a buyer and a seller that have agreed to trade a certain quantity q of roses at price p. In our context what do cooperation and defection imply? Cooperation presumably entails that the seller delivers the flowers as promised and the buyer pays the promised amount upon receiving the flowers. The buyer could defect by withholding the promised payment and keeping the roses. The seller could be tempted to renege in a number of ways. One such way, for example, would be to sell the roses promised to the buyer to the *Flower Auction* if the spot market price, p^a, was sufficiently higher. The incentive compatibility constraints for the seller and the buyer are respectively given by

$$\delta \mathbf{V}^s \geq (p^a - p)q \tag{3}$$

$$\delta \mathbf{V}^b \geq pq \tag{4}$$

The key observation is that the temptations to deviate, i.e. the reneging actions for both parties are directly observed in the data: they depend on actual trade between parties (p and q) and on

prevailing prices at the *Flower Auction* p^a. Under certain conditions (see, e.g., Malcomson (2012)), the two DE constraints can be aggregated and the relational contract can be sustained if

$$\delta \mathbf{V} \geq p^a q \tag{5}$$

The total value of the relationship $\mathbf{V} = \mathbf{V}^s + \mathbf{V}^b$ has to be larger than the value that the transacted flowers would fetch at the *Flower Auction*. The quantity $p^a q$ thus provides a lower bound to the relationship value $\mathbf{V}$.

The model in the paper provides additional empirical guidance. Prices at the auctions fluctuate seasonally but are predictable: for example, prices closer to Valentine's Day are always about 40% higher than during the average week; prices at Mother's Days – which is celebrated at different dates in different countries – are always around 30% higher than in the average week. Parties therefore structure their relationship taking into account such fluctuations. The DE constraint at the time of the largest aggregate temptation to deviate provides the tightest bound to $\mathbf{V}$. For most relationships, the week of Valentine's Day is the time in which the temptation to deviate is the highest – both because prices at the *Flower Auctions* are highest and because suppliers have planned to increase traded volumes to meet the peak demand.

Based on these observations, the paper develops a "structural" test for whether the DE constraint is binding – in which case the value of flowers at the *Auction* traded in the relationship at Valentine's identifies the relationship value $\mathbf{V}$ – or not – in which case we are left with a bound estimate. The idea of the test is that small fluctuations in p^a at Valentine's *do not* change $\mathbf{V}$ as prices are known to revert back to their seasonal patterns. A binding DE constraint then implies $\partial ln(q)/\partial p^a = -1$ in the week in which the temptation is largest (but not in other weeks). The data cannot reject the null hypothesis.

Temptations to deviate thus reveal actual relationship values $\mathbf{V}$. Estimated $\mathbf{V}$ are 384% of weekly turnover in the average relationship (270% and 161% for the average buyer and seller respectively). What do these estimate mean? Are they large or small? It is difficult to benchmark those estimates to the literature – not least because, to the best of our knowledge, relationship values had not been estimated before. Theory again, comes to our rescue. Klein and Leffler (1981) and Shapiro (1983) noted that under free entry the rents required to sustain relationships would be dissipated through initial sunk costs investments.[5] This suggests to benchmark estimated relationship value ($\mathbf{V}$) against estimates of the fixed costs of exporting – which are available in the literature. Relative to such benchmark, estimated $\mathbf{V}$ appear to be substantial. It is worth noting that large estimated $\mathbf{V}$ do not imply a well-functioning market: to the contrary, they suggest that many valuable direct transactions between buyers and sellers likely do not take place because they are not sufficiently valuable to overcome temptations to deviate.

Once we had an estimate for temptations to deviate and for $\mathbf{V}$, we found them to be increasing

[5] Carmichael and MacLeod (1997) show that in an evolutionary model with repeated interactions up front rent dissipation (e.g., expensive meals at the start of a business relationship or – in our case perhaps, visiting prospective buyers abroad or hosting origin trips in Kenya) is the unique evolutionary stable equilibrium.

with relationship's age. While this is to some extent driven by selection (less valuable relationships are less likely to survive into the following growing season), we found that $\mathbf{V}$ also increased as parties interacted more. This posed an interesting problem – we needed to appeal to a model that featured non-stationary behaviour. In models with enforcement constraints between risk-neutral parties with deep pockets (e.g., MacLeod and Malcomson (1989); Levin (2003)) the optimal subgame-perfect equilibrium is stationary. So, subject to the equilibrium selection normally used in the literature, these models were rejected by the evidence that $\mathbf{V}$ increases with relationship's age. There are many models that feature non-stationary behaviour. Within this class, a model with types – e.g., Watson (1999) – offers a natural approach. It is also the type of model used in Banerjee and Duflo (2000) study on reputation and contracting in the Indian software industry – a paper that during our PhD had inspired us to look for the "right" context to study relational contracts. We thus went for a model with persistent types.

Responses to an unanticipated shock helped us to firm up our choice and rule out at least some other models that also feature non-stationary equilibria. Our context offered a unique opportunity to test this by using an unanticipated exogenous shock to production, the episode of post-electoral violence in Kenya. The violence impacted some (but not all) of the regions of the country. While electoral violence is frequent in many parts of Sub-Saharan Africa, the 2007/08 episode in Kenya was an unexpected event ignited by ethnic grievances. Due to the intense episode of violence many producers were not able to harvest all the flowers promised to buyers (see Ksoll et al. (2021)).[6]

Given limited harvest, how should an exporter prioritize across its different buyers? Which buyer should she deny flowers and which ones should she supply? The data reveal an inverted-U pattern between relationship's age – and, presumably, value – and reliability during the violence. The paper argues (with a simple theoretical model) that this pattern is best accounted for by a relational contract model with types – i.e., one in which exporters build a "reputation" for reliability over time. The logic is as follows. As usual, uncertainty over types is needed to preserve reputational incentives. On the one hand, young relationships are not yet sufficiently valuable to be prioritized. On the other hand, in old relationships the exporters' has nothing left to prove. Middle-aged relationships are valuable and are prioritized during the supply shock as the seller is still trying to prove her reliability.

The evidence thus suggests that enforcement considerations alone (i.e., a model without types, at least in its optimal SPE) or an insurance model alone cannot account for the evidence. The published version of the paper actually settles for a simpler model in which the seller's type is *not* known by anyone – i.e., a world with symmetric information as in Holmström (1999). An earlier iteration of the paper also had a model with asymmetric information, as in Halac (2012) – we were not able to empirically distinguish between the two and so we went for the simpler one. There are also models that feature non-stationary dynamics without appealing to types, e.g., Jin and Niko's

[6]On the demand side, Ksoll et al. (2021) show that global buyers were not able to shift sourcing to Kenyan exporters located in areas not directly affected by the violence nor to neighboring Ethiopian suppliers. Consistent with difficulties in insuring against supply-chain risk disruptions caused by electoral violence, firms in direct contractual relationships ramp up shipments just before the subsequent 2013 presidential election to mitigate risk.

approach in this volume or Chassang (2010). For primarily empirical researchers like us, these models are harder to formalize. They also seemed less well-suited to our contexts, in that it wasn't entirely obvious which testable predictions they yielded with respect to the violence shock. While "reputation" was a natural choice, and one that turned out to be consistent with the evidence, we certainly do not intend to take a stand on whether one type of model is more useful than another for empirical researchers.

Although the analysis in Macchiavello and Morjaria (2015) relies on administrative data, detailed contextual knowledge was essential to design an empirical strategy – from selecting the question of interest, to decide on what to look for in the data and how to interpret the shocks. For example, the bulk of the variation in temptations to deviate – and thus in estimated relationship values $\mathbf{V}$ – stems from variation in the amount of flowers traded at Valentine's Day. In this industry, the extent to which relationships can "stretch" at Valentine's appears to be the key relevant dimension that captures how parties expose themselves to opportunism. In other contexts, of course, the relevant dimensions – and thus the observable terms – will differ.

This is all to say that detailed institutional knowledge of the context is needed to capture the salient aspects of the underlying relational contract. We were thus fortunate to be able to rely on several detailed conversations with flower exporters in the summer of 2008 to inform our analysis. A companion project – which ended up being Ksoll et al. (2021) – originally meant to focus on understanding the impact of the violence on the industry and how exporters had reacted to it. For that, we designed, and then conducted, interviews with over 70 exporters. While part of the survey was retrospective (to understand the impact of the violence a few months earlier) a lot of the survey was focused on understanding exporting marketing strategies. At the time we had designed the survey, we did not have the administrative data and we did not have a full grasp of the sector. Most of the interviews, then, ended up being open ended conversations with exporters – sometimes over lunch or dinner – about the industry and the way they go about their business. We had lots of fun conducting these interviews and learning about the vagaries of entrepreneurs – often of foreign origins – who ended up producing flowers in Kenya. But the interviews also left us with many insights and anecdotes which, even though they did not make it into the paper directly, greatly influenced our empirical approach and understanding of relational contracts.[7] For example, the reliability angle – which ended up being *the* mechanism most consistent with the evidence – was a key concern voiced both by buyers and exporters alike. For a while we didn't understand why parties did not use price-indexed contracts – until an exporter told us that they wouldn't make a difference because "*yes, of course the buyer needs to trust us ... but we need to trust the buyer too*" (read: incentive compatibility constraints can be aggregated!). Later on, we realized this observation likely also explains why prices were not increased during the violence.

Other insights, did not make it into the paper – not even implicitly – but ended up inspiring (plans for) future work for both of us. For instance, a buyer complained about an exporter: *"she*

[7]The quotes that follow should not be taken literally – they are based on our recollection of events, as we did not take audio records of the interviews.

is a wonderful lady, her flowers stupendous and her farm very well managed ... but she is never able to deliver a few extra boxes if you ask her because she commits all her flowers in advance" – in the presence of small idiosyncratic shocks sellers value demand assurance and global buyers value some flexibility, and this is why both sides keep accounts open at the Flower Auction even though they trade most of their flowers, most of the time, only through relationships. Asked about the contracts they sign with global buyers, an exporter remarked *"we do write the contract so that a contract is never needed"* – what he really meant, in the context of the interview, was that the contract helps clarifying each parties' role and expectations.

Detecting Opportunism. In most models, parties do not engage in opportunistic behaviour on-the-equilibrium path: the relationship value $\mathbf{V}$ is sufficient to deter parties from behaving opportunistically. In other words, if parties expected DE constraint to be violated, they would not trade in the first place. Or, perhaps, they would *agree*, as part of their relational contract, to temporarily suspend cooperation following circumstances in which the temptation to deviate gets too strong – they would agree to do so despite knowing that nobody has actually cheated in equilibrium (Green and Porter (1984)).[8]

To what extent is this true in practice? Detecting opportunistic behaviour is challenging. First, transaction data typically record the trade that takes place, not the trade that was supposed to take place. In other words, information about defaults – let alone on default on informal arrangements – is rarely available in standard datasets. Second, there is an identification challenge: it is difficult to distinguish whether an observed default happens because the defaulting party could not comply with the contract or whether instead it chose not to knowing that it could get away with it – a situation which we label as strategic default.

Blouin and Macchiavello (2019) identify strategic default in the international coffee market. They analyse a dataset with detailed information on 800 forward sale agreements involving over 300 exporters from 21 developing countries. The data contain information on the underlying commercial contract (the trade that *is supposed* to happen) and on the actual transactions that took place (the trade that *did* 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 $\mathbf{V}$ (Klein (1996)). The key word here is unforeseen. In Macchiavello and Morjaria (2015) the price peak at Valentine's Day is predictable and thus parties structure their relationship in advance to navigate those dire straits. Here, instead, we need large unanticipated shocks that potentially induce parties to default.

Again, contextual features of the coffee sector, come to our rescue. A combination of price shocks and contractual types common in the industry greatly simplify our identification problem. Two forms of forward contracts are observed. The buyer and the exporter can agree on a *fixed*

[8] Green and Porter (1984) was one of the earliest models of repeated games with asymmetric information and Levin (2003) later adapted these ideas to relational contracts in an agency context. With uncertainty, the intuition that with more frequent transactions cooperation is easier is in general not true – the type of information is important.

price contract or on a *price-indexed* (or "on differential") 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 contract on differential. Again, the exporter's *DE* constraint is given by:

$$\delta \mathbf{V}^s \geq (p^w - p^c)q^c \tag{6}$$

This *DE* constraint reveals that a sufficiently large unanticipated increase in the world price p^w triggers a default on fixed price contracts but not price-indexed ones.

A key challenge in testing this observation is that parties' expectations at the contracting stage are typically unobserved. Institutional features of commodity markets – including coffee – however, lend us a helping hand. In particular, prices of coffee futures contracts can be used to proxy for parties' expectations at the contracting stage. Consider a specific contract signed at date d for delivery at date d': the ratio between the spot market price at the delivery date d' and the futures price for delivery at d' quoted at the contracting date d yields a contract-specific measures of price surprises: a ratio > 1 (< 1) implies that world prices have increased more (less) than what parties might have reasonably anticipated at the time of contracting.

The data reveal that contractual defaults on fixed price contracts – but not on differential price contracts – are significantly more likely after large positive price surprises. Contractual defaults are relatively rare in the data (their prevalence depending on the exact definition). However, for the baseline definition of default we find that $\approx 50\%$ of the observed defaults are likely strategic in nature. For example, exporters are differentially more likely to default on fixed price contracts even when world prices increase *after* the end of the harvest season – i.e., after the coffee is already in the warehouse and supplying farmers have been paid. There is also evidence that buyers are more likely to discontinue suppliers after a default that has occurred at a time of a large positive price surprise and that defaulting suppliers carry on business in the following years (which suggests that the default was unlikely due to financial or operational difficulties).

Similar to Macchiavello and Morjaria (2015), the analysis in Blouin and Macchiavello (2019) is based on administrative data. A close familiarity with the context – obtained through years of engagement in the sector – was again essential to design the empirical strategy and interpret the results. For example, the authors were able to discuss at length with buyers their perceptions of contractual defaults in the industry and their approach to renegotiation.[9] One buyer explained "*yes we do renegotiate, we don't like to do it – and it depends on who and how they come to you because coffee enterprises are so dramatically different. [...] and then there's places that have a bunch of people with MBAs [...]. So it really depends on how they approach you and who they are to renegotiate pricing when the price does go up. But they definitely do it, and some do it more than others. And we do accept it in certain circumstances. Because, you can either try to enforce*

[9]Having learned the lessons from the fieldwork in Kenya, the quotes that follow are exact transcriptions from audio records of the interviews and appear in the published version of the paper.

the contract, which is almost impossible to do; or you can say I don't want your coffee and stop buying coffee from them but that's not always a good choice; or you can accept it and so I would say the majority of the time we accept it and sometimes we say no, I'm sorry". Another interviewed Director of Purchasing and Production at a large trading house explained an interesting feature of the data – if sellers default when prices go up, why don't buyers default when prices go down? Again, quoting from the interview "*If you default on your own contract, if you outright say – like – 'I'm not buying that,' you're losing money because you've already invested in your book in paper. And so, there's that double incentive that when you buy paper against your physicals, it shrinks your range of options*". Translation: buyers typically use future markets to hedge the price risk on their forward purchases of (physical) coffee. Once they do that, defaulting on the forward contract – e.g., refusing to accept a delivery – increases the risk of defaulting on a future contract and/or on a promise to deliver coffee to a downstream roaster/retailer. Both cases would be costly to the buyer.

Strategic default is thus a concrete possibility in this market and it introduces a trade-off between price risk and counter-party risk: a price-indexed contract foregoes price insurance but is not subject to the risk of strategic default. Relationships with higher $\mathbf{V}$ have lower risk of default and thus can "afford" to sign fixed price contracts. Indeed, older, more established relationships, are more likely to sign fixed price contracts, even conditional on buyer and seller fixed effects.[10] Somewhat paradoxically then, this has the counter-intuitive implication that strategic default is detected on relatively more valuable relationships that afford fixed price contracts. The possibility of strategic default, however, imposes larger costs on less established relationships that end up having to agree differential contracts in order to avoid strategic default in equilibrium.

Blouin and Macchiavello (2019) calibrate the model and recover estimates of the relationship value $\mathbf{V}$ for each contract in the data. As in Macchiavello and Morjaria (2015), estimated $\mathbf{V}$ are large. The structural estimates, however, allow to make further progress. For example, a counterfactual analysis reveals that – relative to a first-best scenario in which contracts are perfectly enforced – the possibility of strategic default, and the resulting missing insurance market – lowers output for the average exporter by 16% and leads to lower purchases and prices paid to farmers upstream. What is perhaps most notable is that this type of inefficiency is detected on firms that are (very) large by developing countries standards. These observations also underscore the value of developing empirical structural models of relational contracting to quantify welfare losses and perform counterfactuals to evaluate alternative contractual arrangements and policies.

More Values, More Temptations Macchiavello and Morjaria (2015) and Blouin and Macchiavello (2019) are, of course, not alone in deriving testable implications from models of relational contracting (or reputation) and test them using unanticipated shocks as exogenous variation for the temptation to deviate.

[10] Corts and Singh (2004), instead, finds that oil and gas companies are *less* likely to choose fixed-price contracts as the frequency of their interaction with a driller increases in the US Gulf of Mexico and Mexican offshore waters. The nature of the incentive problem, though, is radically different.

Antràs and Foley (2015) provides a fascinating contribution on the financing terms that support international trade, using transaction-level data from a US exporter. They show that the choice of trade finance terms balances the risk that an importer defaults on an exporter and the possibility that an exporter does not deliver goods as specified. Interestingly, MacLeod (2007) shows that contract design is sensitive to the structure of information release and therefore predictions can be derived on who should hold the reputation as a function of the information available. In particular, the contract can allocate the breach decision to the buyer or the seller. More precisely, if the buyer is reputable, then the sellers supply the good, and the buyer pays if the good is high quality. Conversely, if the seller has the reputation, then the buyer pays the seller in advance, who then supplies a high quality good, with a warranty to remediate quality if there is a problem. Antràs and Foley (2015) thus provide direct empirical evidence on exactly this point. They also find that importers located in countries with weak contract enforcement typically finance transactions but that these firms overcome the constraints of such environments as they establish relationships with the exporter.[11]

Gil and Marion (2012) provides an early example of a study that focuses on the role of future interactions. They show that contractors post more aggressive offers in highway repair bids in California when more future projects are announced by the local public authorities. Gil et al. (2022) also focus on the consequences of a shock that permanently changes the value of relationships. They study how firms in the U.S. airline industry restructure their relational contracts following the financial crisis. Major carriers outsource local routes to regional partners. These relationships must be self-enforcing because a key aspect of airline operations — the exchange of landing slots under adverse weather — is formally non-contractible (see Forbes and Lederman (2009)). Following the financial crisis in 2008, major airlines were less likely to continue outsourcing a specific route to a regional partner the lower the expected value of the overall relationship – i.e., when there was a higher likelihood that the negative shock would place the relational contract outside its "self-enforcing range".

In a recent paper, Bernasconi et al. (2022) test for collusion sustained by the value of future interactions in the context of the Colombian energy market. As already noted, models of collusive behaviour – such as Green and Porter (1984) – share many similarities with models of relational contracting. As in a relational contracting model, in models of collusive behaviour firms deviate from current profit maximization in anticipation of future rewards. The difficulty in testing for collusive conduct comes from the fact that current profit maximization places little restrictions on firms' pricing behaviour. Bernasconi et al. (2022) take advantage of the *announcement* of a market transparency reform that potentially made it harder for firms to sustain a collusive arrangement and show that bids submitted by a subset of firms in the market collapsed immediately after the

[11] Ghani and Reed (2022) provide another example of how relational arrangements evolve in response to changes in circumstances. They study the relationship between ice retailers and small fishing boats in Sierra Leone. They find that initially ice retailers prioritize deliveries to their most loyal clients when supply from the monopolist ice manufacturer is scarce. The entry of a second ice manufacturer increases supply, temporarily destroys pre-existing relationships, until new arrangements are put in place that use the provision of trade credit as a further (relational) margin of competition.

announcement, and before the *implementation*, of the reform. Using an event-study framework, they find that proxies for cartel membership capture well the observed drop in bids following the announcement. They rule out con-founders and provide forensic evidence of how the cartel functioned and how firms might have communicated about it. They also calibrate the dynamic enforcement constraints and confirm that a collusive arrangement was sustainable before, but not after, the reform.[12]

Other contributions focus more directly on uncovering the exact form taken by relational adaptation in the data. Barron et al. (2020) study relational adaptation to changing circumstances between movie distributors and an exhibitor. They focus on the renegotiation of revenue-sharing contracts and show that the evidence is best accounted for by a model in which the distributor rewards the exhibitor – who has discretion about whether and when to show the movie – for ex-post decisions that are privately costly but jointly beneficial. Harris and Nguyen (2021) provide evidence on relational contracting in the US truckload freight industry – a setting in which shippers and carriers engage in repeated interactions under contracts that typically fix prices but leave the door open to opportunism in slot allocation and availability. The extremely rich data allows for a detailed description of the relational arrangements in the industry: shippers use the threat of relationship's termination to deter carriers from short-term opportunism; carriers respond to the resulting dynamic enforcement constraint behaving more cooperatively when the future value of the relationship is potentially higher. In follow-up work, Harris and Nguyen (2022) develop an empirical framework to investigate whether the prevalence of long-term relationships led to thinner, less efficient spot markets, and thus quantify the market-level trade-off between long-term relationships and the spot market. At the relationship level, they find that long-term relationships have large intrinsic benefits over spot transactions. At the market level, however, they find a strong link between the thickness and efficiency of the spot market. Too many relationships, can undermine market efficiency. Overall, in their context the current mix of governance forms performs fairly well against a first-best benchmark, achieving 44% of the relationship-level first-best surplus and even more of the market-level first-best surplus.

3 Avenues for Future Work

We next outline three promising areas for further empirical research on relational contracts. First, beside relational contracts *within* firms – which were already highlighted in the introduction – we identify a need for evidence that tests whether, indeed, the adoption of relational practices is associated with higher productivity and organizational performance. To test this hypothesis, empirical work must overcome a key challenge: to measure "relational" practices that rely on the future value of the relationship – as opposed to just management practices – and that are not tautologically related to the performance measure. The attentive reader will have also noticed that so far, governance structures – in our case, the existence of relational contracts – has been taken

[12] Igami and Sugaya (2021) also calibrate the dynamic enforcement constraints of a known vitamin cartel.

as given. Analogously to the empirical literature on vertical integration, we have been focusing on testing predictions on how relational contracts impact behaviour, rather than on identifying conditions that correlate with the adoption of relational practices. We thus discuss two further areas for future work, both related to a better understanding the conditions under which relational contracting emerges. We distinguish between two separate, but clearly interconnected areas. At a more micro-level, we need a better understanding of which *organizational capabilities* allow to develop and sustain relational contracts – we focus on across firm's boundaries transactions, but this is an important area also for within firm transactions. At the more macro-level, instead, we think understanding the *institutional capabilities* – broadly intended as encompassing both formal institutions but also (or, rather, especially) cultural norms and – that underpin relational contracting is a second, and complementary, priority area for future work.

3.1 Relational Contracts and Productivity

Persistent performance differences (PPDs) among seemingly similar enterprises within narrowly defined industries are now widely accepted (Syverson (2011)). These differences have been documented in developed and developing countries alike and are so ubiquitous that, indeed, large swaths of theoretical modeling in fields as diverse as trade, macro and labour take them as a foundational feature of models that are then taken to the data. The question on what *causes* these performance differences has of course also attracted enormous empirical attention and remains a thriving area of research. Scholars have provided a wide range of possibilities to explain these differences – including differences in the adoption of management practices, human capital, technology and environmental forces, e.g. regulation and competition (see Syverson (2011)). A very well established body of empirical work highlights the tight connection between the adoption of certain management practices and firm's performance (Bloom and Van Reenen, 2010; Bloom et al., 2010)).

Given this evidence, a key question is why don't these superior management practices diffuse more swiftly. Gibbons and Henderson (2012a,c) argue that these managerial practices might in turn rely on relational contracts and that these practices may be difficult to copy since relational contracts are hard to build. To what extent do relational contracts influence firms' performance? Answering this question is difficult for at least two reasons. First, almost by definition, relational contracts are difficult to observe. They are implicit informal understandings rather than explicit written contracts and are based upon common understanding of promises that cannot be expressed in a legally binding way to a third-party. Commonly available datasets reveal, at best, whether parties trade – perhaps *repeatedly* – with each other but do not contain information on whether parties trade in a *relational* manner. Second, even if the measurement challenge is overcome, identification of causal impact would remain difficult due to standard empirical concerns of endogeneity and omitted variables.

The measurement challenge can potentially be overcome through the use of appropriately designed surveys. Recall, relational contracts allow parties to utilize knowledge of their particular situation and are deeply rooted in parties' specific circumstances. The measurement of relational

contracts thus requires a detailed understanding of the setting with bespoke survey tools tailored to the relevant relational practices between transacting parties. It might be difficult to codify and measure relational contracting across a wide range of industries using a standardized survey tool. Within-industry studies, however, might enable accurate measurement of relational practices and explore drivers of adoption and their relation to firm performance.

Macchiavello and Morjaria (2021) provides an example. We focus on trading relationships in the Rwandan coffee sector – a context in which around two hundred coffee mills (buyers) source coffee from about four hundred thousand smallholder farmers (suppliers). Unlike the typical sector in developing countries, this context features many relatively large firms that operate a standard and simple technology, thereby facilitating a quantitative analysis. Specifically, the setting allows to overcome two core empirical challenges. First, we were able to implement a census of all mills and survey a random group of farmers to capture key features of the transactions between mills and farmers. Due to imperfect rural markets for inputs and financial services, it is efficient for parties to exchange a rather complex bundle of inputs, services, trade-credit – and coffee – over the entire course of a year. We designed a curated survey tool aimed at capturing the adoption and diffusion of these relational practices across mills and farmers – thereby solving the measurement challenge. These relational practices all correlate positively with each other as well as with measures of bilateral trust, giving us reassurance that we are capturing the "bundle" of transaction and as they are *relational* they should come in a "package".

Second, the common and simple technology operated by the mills allows for a precise measurement of mill's performance – it is easy to compute unit processing costs and capacity utilization. Results show that the adoption of relational contracts strongly correlates with performance: mills that adopt relational contracts with farmers have higher capacity utilization and lower unit processing costs. Again reassuring us that relational practices are important as they are tightly linked with firm performance,

The primary focus of Macchiavello and Morjaria (2021) is *not* to study the causal impact of relational contracts on performance – rather the paper is concerned with understanding how competition – a key comparative static in relational contract theory – between mills affects relational contracts and ultimately mill's performance and farmers' welfare. Besides the intrinsic policy relevance, answering the question is important to understand if markets in which relational contracts are important behave differently from markets in which they are not. The main idea is that competition – by increasing temptations to deviate and by lowering future relationship values – might destroy valuable relationships and led to worse market outcomes.

To overcome identification challenges, we came up with an innovative solution to take advantage of an engineering model for the optimal placement of mills to construct an instrument that isolates geographically determined variation in competition – due to having expertise in GIS and remote sensing tools.[13] We find that competition between mills indeed undermines the prevalence of

[13]To visualize the identification strategy, imagine the surface of a donut. As long as one controls for suitability for mill placement within the mill's catchment area (the hollow part of the donut), the suitability within the donut area influences the competition experienced by a mill, without having a direct effect on mill's operations within the

relational contracts. Conditional on the suitability for mills' placement within the mill's catchment area, mills surrounded by more suitable areas face more competition from other mills; use fewer relational contracts with farmers; and exhibit worse performance. An additional competing mill also reduces the aggregate quantity of coffee supplied to mills by farmers and makes farmers worse off – the negative effect of competition is not simply due to the "business stealing" effect (Mankiw and Whinston (1986)). The analysis also reveals that competition hampers relational contracts both directly by increasing farmers' temptations to side-sell but also indirectly by reducing mill's profits and thus the future relationship value.

Macchiavello and Morjaria (2022a) follows the more recent evolution of the Rwanda coffee industry. In particular, the findings in Macchiavello and Morjaria (2021) are (mostly) based on a comprehensive survey conducted in 2012. At that time, there were about 200 coffee mills in the country. Nowadays, there are around 300 mills. The findings in Macchiavello and Morjaria (2021) would imply that relational contracting has become even more difficult. This appears to be confirmed in follow-up surveys conducted in more recent years. Macchiavello and Morjaria (2022a) focuses on understanding the recent process of consolidation in the ownership of mills. The expansion in the number of mills has been accompanied by the emergence of larger firms (groups) that own multiple mills. A difference-in-differences design reveals that ownership changes do not improve performance unless the mill is acquired by a foreign firm. Our preferred interpretation, is that foreign firms successfully implement management changes in key operational areas, including building relationships with farmers. Upon acquisition, both domestic and foreign owned mills attempt to implement similar changes, but domestic firms face resistance from workers and farmers. A possible explanation is that domestic owners have relationships with their local communities. While those can create opportunities to establish new mills and acquire existing ones, these same relationships can create pressure to maintain status-quo relational arrangements, hindering the implementation of managerial changes. This also points to the importance of understanding organizational capabilities that underpin relational contracting. More on this below.

Calzolari et al. (2021) study the relationship between the use of relational contracts, performance and competition in the context of the German automotive industry. Using a unique dataset collected from a tailor made survey conducted with both car manufacturers and their suppliers, they find that higher trust – the belief that the trading partner behaves in the interest of the relationship – is associated with higher quality of the automotive parts. In contrast to Macchiavello and Morjaria (2021), however, they find that higher trust is associated with *more* competition among suppliers. In their model, buyers that expect to trade for a longer period of time, or more frequently, can *afford* more competition among suppliers in the procurement of parts in which they have bargaining power. An alternative mechanism, is that competition not only shapes outside options in relational contracts, but it also may determine the strength of norms of cooperation and thus affect how firms design their informal relationship. For example, competition might increase firms' incentives to undertake investments that increase trust – an issue we return to momentarily

catchment area – thereby providing a valid instrumental variable.

when we discuss organizational capabilities that underpin relational contracts – and therefore the relationship between competition and relational contracts might sometimes be positive. Somewhat in contrast to this logic, however, in other industries higher expectations of future trade appear in tandem with fewer suppliers – see Taylor and Wiggins (1997), Andrews and Barron (2016), and Barron and Powell (2019) for a theoretical model and Cajal-Grossi (2021) for evidence from the garments industry. Furthermore, Boudreau et al. (2023) provides further evidence of a negative correlation between the prevalence of relationships and the degree of market competition across multiple layers of both the global coffee and garment supply chains. These correlations are consistent with the causal evidence in Macchiavello and Morjaria (2021) and with the view that relational contracts require a certain amount of ex-post rents that might be dissipated in highly competitive markets.[14]

While these contributions relate performance differences – either productivity, or quality – to the adoption of relational contracts, they do not directly provide causal evidence that relational contracts impact performance. The evidence in Macchiavello and Morjaria (2021) points in that direction, but an ideal empirical test would of course rely on exogenous variation in the adoption of relational contracts – something that might be hard to find in a natural experiment setting but that could, at least in principle, be engineered within the context of an experimental intervention in the field.

A recent study by Blader et al. (2019) comes close. They investigate how relational contracts *within* a large U.S. transportation company affect performance. This study thus offers a rare example of an empirical paper on *within-firms* relational contracts. The company is undergoing two major changes. First, it is in the middle of a program that rolls out a "value intervention" – a program that could be interpreted as trying to change the relational contracts within the firm. The firm is also in the process of equipping its trucks with an electronic on-board recorder that allows to provide drivers with information on their driving performance. The authors conduct a randomized controlled experiment in which drivers at some sites are informed only about their own performance; while at other sites their performance is bench-marked against that of other drivers. The authors find that the latter leads to better performance than the former only if the site has not yet received the separate – non-randomized – intervention aimed at changing "values" in the workplace. The results are consistent with the presence of a conflict between competition-based managerial practices and a shift to a cooperation-based value system. In other words, the impact of formal incentives is contingent on the underlying relational contract.

[14]Interestingly, in the domestic stages of the garment and coffee chains studied in Boudreau et al. (2023), the importance of relationships manifests itself differently. In coffee, as in other agricultural chains, the interlinked transactions between smallholder farmers and first stage processors/intermediaries as those in Macchiavello and Morjaria (2021) are examples of relational contracts between firms. In the case of garments, however, what correlates negatively with competition is the quality of industrial relations between garment factories and their workers – a proxy for relational contracts within firms.

3.2 Organizational Capabilities and Relational Contracts

A first area is that we would like to have a better understanding of the organizational capabilities that underpin firms' ability to develop relational contracts with customers and suppliers. The diffusion of just-in-time inventory systems and outsourcing have turned firms' approaches to sourcing into a particularly important strategic decision (Dyer and Singh (1998)). Different ways of organizing sourcing must be coordinated with other operational processes (Cooper and Ellram (1993)), and require specific internal structures and suitable management practices (Milgrom and Roberts, 1990, 1995) such as specific systems of inward and outward communication and knowledge diffusion.

Firms, even within narrowly defined industries, end up developing distinctive approaches to sourcing (Helper and Henderson, 2014). For example, Monteverde and Teece (1982)'s classic study of vertical integration of components highlights differences between Ford and GM approach to sourcing. The paper is most well-known for its test, and empirical support to, the transaction costs economics theory of vertical integration: the two car assemblers integrate components whose production processes generate quasi-rents due to specialized, non-patent-able know-how. A perhaps less appreciated finding of this classic study, however, is that the buyer's dummy accounts for a substantial share of the observed variation in vertical integration across components. This suggests that – holding a component's technical specification constant – Ford and GM differ in their overall approach to sourcing. More recently, Helper and Munasib (2021) use U.S. customs data on the imports of car parts and find that controlling for detailed product fixed effects Japanese owned importers source parts more relationally than American and European companies.

Building on these ideas, Cajal-Grossi et al. (2023b) distinguish between *spot* sourcing – in which the buyer keeps suppliers at arm's length, avoids any type of commitment, and allocates short-term orders to the lowest bidders from *relational* sourcing – in which orders are allocated to few suppliers with whom the buyer develops long-term relationships. Using transaction-level data from multiple countries, the paper formally tests the hypothesis that buyers' sourcing strategies are largely driven by buyer-level capabilities. A loss-of-fit exercise quantifies the relative importance of buyer fixed effects versus other factors in driving variation in sourcing strategies across buyers, products and country of origins. Starting from the most saturated specification, buyer fixed-effects account for over 40% of the explained variation in sourcing strategies, vis-à-vis 16% and 14% explained by product-country and product-destination respectively. Organizational capabilities appear to play a key role in driving buyers' approaches to sourcing in the industry.

Cajal-Grossi et al. (2023b) are also in the unique position to be able to match inputs used to produce specific export orders. They find that Bangladeshi suppliers earn higher prices, and margins, for otherwise identical export orders produced for relational buyers compared to those produced for spot buyers. They interpret these findings – which are robust across a wide range of specifications – through the lens of a model in which suppliers are hit by idiosyncratic shocks and struggle to supply buyers reliably. Imperfect contract enforcement implies that spot contracts are effective in securing supply under 'business as usual' conditions, but fail to provide adequate incentives when suppliers are disrupted by shocks. This introduces a trade-off: relational buyers are

able to secure reliable supplies, but pay higher prices; spot buyers pay lower prices but occasionally suffer delivery failures. In equilibrium, ex-ante identical buyers sort into ex-post different sourcing strategies (thereby providing a rationale for distinctive approaches to sourcing within narrowly defined industries) and, relative to the social optimum, there are too few relational buyers, creating a rationale for policy intervention.

Cajal-Grossi et al. (2023a) find that the buyer's size is positively correlated with adoption of a relational approach to sourcing. This suggests that there might be fixed costs required to set up relational contracts and economies of scope in the formation of relational contracts. Taken to a completely different context, this observation provides an avenue to better understand the lack of growth among micro-enterprises, the dominant form of employment in developing countries despite programs that have aimed to relax both supply and demand side constraints. In general, such program won't work if the "entrepreneur" is unable to develop credible and clear relational contracts with (potential) employees. First, the limited scale of business makes it hard to gain credibility. Casaburi and Macchiavello (2019) confirms this hypothesis in the Kenya dairy sector. Due to saving constraints, farmers value – i.e., are willing to receive significantly *lower* prices in order to be paid in bulk, at a later date. Such payments, however, require the buyer to be credible: to pay the large sum of money when it is due, rather than run away with the cash. Casaburi and Macchiavello (2019) experimentally confirm that farmers do not trust small, informal, traders due to a lack of credibility. In the context of Macchiavello and Morjaria (2021), it is indeed the case that larger mills are more likely to pay workers infrequently, rather than daily or weekly – a proxy for credibility. Second, it is the *future* value of the relationship that makes relational contracts sustainable. Programs are unlikely to change future values, or to do so in a way that can be clearly articulated to (potential) workers. This argument of course echoes Gibbons and Henderson (2012a) point that although credibility might, in principle, be instantly acquired, clarity may take time to develop and may interact with credibility in complex ways so that relational contracts are in practice difficult to build. A potentially promising approach to study the role of clarity and credibility in building relational contracts is to exploit changes in organizational policies, combined with knowledge of members' beliefs about those policies (and how to interpret them). Casaburi and Macchiavello (2015) provide an example, exploiting a cooperative attempt to boost members' loyalty in the Kenya diary sector.

Organizational capabilities are likely also important on the exporters' side. Most of the literature as we mentioned earlier focuses on trading parties already being in relationships. However, parties often struggle to build and maintain such relationships. Antić et al. (2023) tries to disentangle the role that credibility and clarity have in building and maintaining relational contracts (Gibbons and Henderson, 2012a). They study the context of exporters in the Ethiopian floriculture industry, where even though exporters receive higher and less volatile prices through direct relationships – only foreign-owned firms manage to directly export to global buyers, while domestic-owned firms almost exclusively rely on the Dutch flower auctions. Conditional on success history they find domestic firms are as likely to attempt new relationships, and they are also just as likely to maintain

them conditional on making it past the third shipment (thus no difference in credibility). However, domestic firms are 30pp more likely to lose a direct relationship within the first three shipments. The evidence is consistent with more severe clarity problems for domestic firms, i.e., that domestic firms are less clear about the terms of the relational contract with potential buyers, causing relationships to break down early on. The paper highlights the importance of policies targeting clarity problems to improve firms' ability to export differentiated products.

3.3 Institutional Capabilities and Relational Contracts

Given our interests in development, a better understanding of which environmental conditions – which we might refer to as "cultural norms" – are conducive to relational contracting appears to us as a natural area for further work. Theoretical and practical considerations suggest that the *demand* for relational contracting should be, if anything, higher in developing countries. On the other hand, the *supply* of relational contracting could be lower – so the net effect on whether relational contracting is more or less prevalent in developing countries remains a priori ambiguous.

This is an area far wider than what we can discuss here. Viewing culture as shared cognition, a certain degree of cultural homogeneity could reduce strategic uncertainty and foster clarity. Generalized norms of trust could also lead to more optimistic beliefs about the counter-party and encourage experimentation of new relational contracts. The starting point is the observation that DE constraint provides us with necessary, but not sufficient, conditions for relationships to emerge.

In a fascinating recent paper, Breza et al. (2022) provide a clear illustration of the importance of norms. The starting point of their investigation is that, in developing countries, the individuals that participate in the same localized market often share social ties thereby creating scope for collective behaviors that can generate market power. The authors experimentally test the hypothesis that a large group of decentralized workers implicitly cooperate to prevent downward pressure on wages, using a field experiment with existing employers in 183 local labor markets in rural India. They find that very few workers (less than 2%) are willing to accept jobs below the prevailing wage despite high unemployment. This number, however, raises to 26% when this choice is not observable to other workers. In contrast, social observability does not affect labor supply at the prevailing market wage. Finally, they show that workers are willing to pay to sanction those who accept wage cuts. Besides highlighting the importance of norms to sustain forms of cooperative behaviour, the results also suggest that market power in developing countries might be more widespread than previously believed. For example, they find that measures of social cohesion correlate with downward wage rigidity and its unemployment effects across India. They also find that sellers in decentralized spot market settings in India and Kenya appear unwilling to adjust prices downwards due to strong social and economic repercussions if they were to do so.

The literature on lab-experiments generally find less cooperation than what is predicted by the theory. Bubb et al. (2018) provide a striking example in the field: limited enforcement of water transactions causes significant output losses between neighbouring 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. In a different context – Blouin (2021) combines lab-in-the-field and historical experiments to show that a negative inter-ethnic relationship between ethnic groups in Rwanda and Burundi lowers trust and long-term relationships formation between farmers.

Macchiavello and Morjaria (2022b) provides a preliminary attempt to build a bridge between two different strands of empirical literature on trust: the literature on *generalized trust* and the literature on *relational contracts*. We revisit the measurement of relational contracts in Macchiavello and Morjaria (2021) and, using questions on bilateral and generalized trust along the lines of those in the World Value Surveys, demonstrate that bilateral measures of trust correlate well with observed relational contracts. Measures of generalized trust, however, do not. The lack of a correlation in the data could of course be due to many other reasons – not least measurement error – and it would thus be unwarranted to theorize too much from such thin evidence. However, a model along the lines of Ghosh and Ray (1996) also further elaborated in Ghosh and Ray (2023) is potentially consistent with the findings. In their model, the presence of myopic types that never cooperate generate equilibria that are characterized by an initial testing phase followed by a (stationary) relational contract once parties have learned they have been matched with a non-myopic partner. Up to a certain point, it is precisely the presence of myopic types that permits cooperation to emerge by making deviations less appealing. A prediction of the model is that a reduction in the frequency of myopic types – which we might empirically proxy with a higher level of generalized trust – can lower the degree of cooperation that can be sustained. The relationship between generalized trust and cooperation, proxied by the prevalence of relational contracts, might thus be non-monotonic. Much remains to be uncovered in the quest for factors that enable the development of relational contracts.

4 Conclusion

A final consideration. This emerging body of work is beginning to shape into a rich empirical portrait of the relational contract family. While many members are still missing, many of the implications of relational contract models have been tested, and confirmed in the data, more precisely than before. The evidence comes from a wide spectrum of market settings – in developed and developing countries alike – consistent with the common wisdom that relational contracts are indeed ubiquitous in practice. Relational contracts are not ubiquitous, however, in the theoretical models used in fields outside organizational economics – such as macro, trade and labour. Some might object that a change wouldn't be a desirable development. We disagree. The idiosyncratic nature of relational contracts – which, as we have seen vary across markets, industries and even firms, however complicates the expansion of such models to new settings. This makes it even more important for the micro-empirical literature to take the one aspect that is common to all members of the family – the DE constraint – as its starting point.

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