Agreements Must Be Kept?
Residential Leases during Covid-19 *

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Abstract

This paper studies how a Covid-19 lockdown affected residential lease payments. Survey data on 1511 Israeli renter households show nearly one in eight households not paying full rent during the lockdown, with these households holding back, on average, a third of their contractually due rent. Financially fragile households with greater income cuts, and households with leases lacking provisions that effectively provide for damages upon non-payment pay a lower share of contract rent. So do households with more frequent encounters with their landlord, or longer tenure in the apartment. Bargaining and relational contracts theories help explain these results.

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1 Introduction

How resilient are contracts to large unexpected shocks? Although the adaptability of continuing economic relationships governed by contracts has been the subject of much theoretical work (Hart and Moore (1988)), there is only limited direct empirical evidence on when contracts are honoured. There is especially little evidence on non-payment in residential lease contracts, which tend to take a simple form of fixed duration and regular monthly payments, with no provision for exceptional circumstances.

This paper studies how residential rental payments were affected by the Covid-19 crisis in Israel. Israel instituted a lockdown on March 19 2020, leading to an unprecedented rise in unemployment and a steep decline in labor income for many renting households. Although unemployment benefit eligibility was extended and the self-employed received some transfer payments, these fell far short of fully compensating affected households, which were on average younger and poorer. Renting households spend a significant share of income on rental payments and often have limited liquid assets. We find 'financially fragile' households with substantially cut income, and leases with few contractual provisions restraining non-payment, much more likely to pay less than full rent. Households in strong relationships with their landlords also paid a smaller share of contracted rent. While we study the Israeli rental market, non-payment and public calls for payment deferment and eviction moratorium have been reported in many countries.[1]

Our empirical analysis uses a survey we conducted during the last week of April among 1511 households broadly representative of Israeli renter households. We use the survey to first evaluate the severity of the lockdown for renters, and then ask how rent payments were affected. We find that more than seventy percent of the surveyed households lost some income, with an average thirty percent income cut, mostly driven by the loss of one third of the jobs held by the households. The share of surveyed households reporting joblessness (i.e., no adult member employed) was 5.8% for February 2020 and 29.4% for April.

Turning to rental payments, we find, on average, 7.3 percent less rent paid than contracted for, with one out of eight renters failing to pay full rent, and nearly half of those paying no rent at all. The share of contracted rent paid depends on contract terms and tenants' circumstances. First, households suffering a larger income cut pay less of their rent. Second, households lacking sufficient liquid assets to cover a large consumption shock - the 'financially fragile' - pay a lower share. Indeed, rent reduction is considerably larger among tenants that experienced both an income shock and were financially fragile, and one cannot reject the hypothesis that only the interaction of the two matters. That is, financial fragility matters only when income is cut, and household income cut is associated with rent reduction only

[1] See Federal-Reserve-Board (2020), ILO (2020), and Haag and Dougherty (2020).

for the financially fragile. This points to illiquidity as the core reason why income cuts lead tenants to pay less rent. Third, contractual terms are strongly associated with the share of rent paid. Where the landlord holds post-dated rent cheques or a security cheque from the tenant, or there is a co-signer on the lease, less rent is withheld and, furthermore, any reduction is less sensitive to the income shock. These effects are additive, with each additional guarantee leading to less reduction and less income cut sensitivity. For the most protected landlords, whose lease provides for post-dated cheques, a security cheque and a co-signer, we observe nearly no rent reduction.

These findings are consistent with a complete information bargaining model with outside options as constraints.[2] The tenant's outside option is to breach the contract, where breach is used here to denote any deviation from the contractual obligations, not agreed to by the landlord. If breach becomes more attractive than abiding by the lease, then the tenant will either breach or, by virtue of a credible breach threat, succeed in having the landlord acquiesce to a lower payment. A tenant facing a large income cut will find breach more attractive than before since it permits a move to an apartment more suited to a reduced income. For financially fragile tenants, paying lower rent enables higher non-housing consumption or avoiding costly conversion of illiquid assets. Falling aggregate income may drag down market rents, and so increase all tenants' payoff under breach. This is so even for tenants with unchanged income. For those among them whose utility under the contract is not too far above the pre-Covid 19 payoff from breaching, the movement in the market may suffice to make breach preferred, thus leading to less than full payment.

The three contractual guarantees (post-dated cheques, security cheque and cosigner) capture variations in the parties' outside options. When payment is by post-dated cheques held by the landlord, a tenant who unilaterally fails to pay full rent will have to cancel that month's cheque, incurring bank fees and possibly legal difficulties (when done under agreement, the landlord can simply tear up the cheque). Should the landlord deposit the security cheque, either the tenant's savings will be reduced accordingly, or the tenant will suffer the consequences of a returned cheque. The landlord demanding payment of the cosigner is embarrassing for the tenant and costly for the cosigner. All worsen the tenant's payoff from breach, explaining why they restrain rent reduction in the data.

We also find a lower share of rent paid when tenant and landlord have a closer relationship, as measured by tenant tenure in the rental unit and the frequency of the tenant's encounters

[2]See Shaked and Sutton (1984), Binmore et al. (1986) and Hart and Moore (1988). In this setup, outside options influence terms of trade only when binding. The alternative construct (e.g., Hart (1995)), in which outside options act as disagreement points, leads to the empirically untenable outcome that all contracts are continuously renegotiated (MacLeod and Malcomson (1993)). Here, the first setup is necessary for not all income shocks to imply rent reductions.

with the landlord. These findings are best explained by relational contracts (Macaulay (1963), Telser (1980), Baker et al. (2002)), with the landlord giving up on at least some of the contracted for rent, as part of, or so as to ensure the continuation of, a long-term relationship bearing positive surplus. There are at least three mechanisms by which our two measures are likely to capture the strength of that relationship. Two of them depend on tenant heterogeneity. If landlords are only prepared to consider requests for reduced payment from tenants they know sufficiently well, since only then can they assess whether the tenant is likely to compensate them for the reduction in the future, then we would observe rent reduction only among tenants with a long relationship with the landlord or who frequently encounter the landlord. A related mechanism, relevant for the tenure variable, works through selection, whereby only 'reliable' tenants have their leases renewed (Goodman and Kawai (1985), Guasch and Marshall (1987)). In this case, the landlord of a long tenure tenant can be confident of the tenant's reliability and so the 'repayment' of the rent reduction. In the third mechanism, frequent encounters reflects tenant and landlord belonging to the same social network, where social sanctions can operate more easily (Kandori (1992)).

Our results, then, show both formal and informal mechanisms determining contractual fulfillment. Potentially, they serve complementary roles. While previous empirical studies have focused on either formal or informal practices in contract enforcement, to our knowledge this is the first to consider both. Our findings are documented under the exceptional conditions of the Covid-19 lockdown; yet in normal times households are also affected by consumption and income shocks that lead them to seek to relocate or ask for a rent reduction. The lockdown conditions allow us to observe many such situations.

Our work may be closest to Benmelech and Bergman (2008) who consider rental contracts in the airline industry. Following Hart and Moore (1994), they show that both the airline's financial situation and the lender's outside option (the leased aircrafts' liquidation values) affect renegotiation. Our analogue to the financial situation is the income cut that the tenant household experiences and its inability to cover a large unexpected expense without recourse to non-liquid assets.[3] More generally, this paper relates to work on the resiliency of contractually set prices to changing market conditions, and on the role of specific provisions, of which Joskow (1990) is the seminal contribution.

Most other empirical work on contract renegotiation deals with financial contracts following the 2008 financial crisis, partly because regulatory requirements make these contracts available. For instance, Hsu et al. (2018) show that, among the unemployed, those receiving low unemployment benefits were more likely to default on their mortgage payments. Another

[3]Our measure of financial fragility is similar to measures used by Lusardi et al. (2011), Stavins (2019), FederalReserve (2019). This summary measure frees us from asking numerous detailed questions on households' financial situation that they may have refused to answer.

important finding is that securitized loans were much less likely to be altered (e.g. Agarwal et al. (2011), Piskorski et al. (2010)), perhaps because of dispersed or unclear ownership rights, an issue that does not arise for individual residential leases. These papers tend not to examine the effects of contractual penalties for non-performance which is central to ours. Two exceptions are Roberts and Sufi (2009) and Roberts (2015), which look at the role of covenants in renegotiations of loans taken by publicly listed US firms.

We also contribute to the relational contract literature. By definition, relational practices are hard to measure and therefore empirical evidence is limited. A few papers examine relational contracts in developing countries, where enforcement of formal contracts is imperfect and relational contracts arguably substitute for formal contracts (MacLeod (2007), Macchiavello and Morjaria (2015), Macchiavello and Miquel-Florensa (2016)). Closely related to our paper are McMillan and Woodruff (1999) and Banerjee and Duflo (2000). McMillan and Woodruff (1999) find Vietnamese firms more likely to offer credit to both long-term clients and those whose premises they frequently visit. Banerjee and Duflo (2000) also use previous interactions among contractual parties as a measure of better reputation, finding it affects contract renegotiation outcomes. Unlike these papers, we study an environment with a strong legal system, and document the importance of long-term relationships where formal contracts exist and their provisions, by our findings, matter.

Finally, our study also relates to the tenant-landlord literature. These papers deal with formal contracting, whether for a first lease or subsequent ones, contracted at the end of a previous lease. In contrast, we consider the renegotiation, or breach, of contracts still in force. Nonetheless, this literature provides us with the conceptual framework for assessing heterogeneity based explanations of our findings (Goodman and Kawai (1985), Guasch and Marshall (1987), Hubert (1995), Miceli and Sirmans (1999)).[4]

2 Institutional background

2.1 Covid-19 in Israel

The first recorded case of Covid-19 in Israel was confirmed on February 21, 2020. Israel began enforcing social distancing on March 11. The education system, including daycares, schools and universities were shut on March 14. On March 16, firms exceeding ten employees were required to reduce workplace staff by 70%. On March 19, a state of emergency was declared,

[4]Risk sharing, an alternative to bargaining as a theoretical framework for how price changes with shocks in bilateral relations, is used to conceptualize wage responses to firm-level productivity shocks as insurance firms provide to workers (Guiso et al. (2005), Lagakos and Ordonez (2011)). We could take a parallel approach by viewing rent changes as the pass-through of tenant income shocks to landlord 'wages'. However, positing landlords as generally more risk averse than tenants seems untenable to us. In conditioning on contract provisions that limit the price response, our work differs from these papers as well.

and further restrictions placed on workplaces. By April, the unemployment rate, only 3.6 percent in January, had reached 24.4 percent. More than 844,000 individuals applied for unemployment benefits, of whom 90 percent had been placed on unpaid leave. By the beginning of April, both the legal system and banks were operating at a very limited scale. The Israeli government undertook several measures to ease the economic distress, including extending unemployment benefits. Towards the end of April 2020, some restrictions were relaxed, but economic uncertainty and unemployment remained high. Meanwhile, contractual payment were disrupted, with the share of dishonored and 'cancelled by payer' cheques increasing to 6% and 2%, from 2.5% and 0.35% before Covid-19 (BOI (2020)).

2.2 The housing rental market

In line with the OECD average, some thirty-five percent of Israeli households live in rental housing. Ninety percent of leases last 12 months. These are often renewed, and, on average, households stay 4.5 years in the same apartment. Rent, like income, is typically paid monthly and due at the beginning of each month. Rental apartments are typically owned by households holding one to three properties in total. The share of rental apartments owned by companies, public entities or governed by rent control regulation is small. A new Fair Rent law from 2017 sets minimal physical requirements for rented apartments and limits lease bonds to the lesser of three months of rent and one third of total rent payments. There are no other restrictions on financial terms of the lease contracts.[5]

Contractual provisions for non-payment protect landlords only to the extent that they are enforceable at limited costs. Israeli law provides for expedited court procedures to evict renters who fail to pay the contractual rent. Yet even so, the legal procedures typically last at least two months. The landlord can attempt to collect on the value of dishonoured cheques through the collection system authority, which is presumably quicker than through the standard court system.

3 Data and descriptive statistics

During the last week of April 2020 we surveyed 1511 tenant households, drawn from a private, continuing panel representative of the working-age Jewish population in Israel, with married couples over-sampled.[6] An English translation of the questionnaire appears in the appendix.

Table 1 shows summary statistics, for the whole sample (Columns (1)-(2)) and separately for households paying full rent in April 2020 (Columns (3)-(4)), and those who paid no or partial rent (Columns (5)-(6)). Panel A shows tenant economic and employment variables, panel B

[5]This discussion is based on Raz-Dror (2019), Genesove (forthcoming), Hausman et al. (2020), State-Comptroller (2020) and micro data of the Israeli Central Bureau of Statistics.

[6]The Jewish and Arab housing markets are highly segregated. Renting is rare in the Arab market.

lease conditions and landlord-tenant relationship indicators, and panel C socio-demographics. The share of rent paid appears in panel D.

Beginning with Panel A, mean net household monthly income in February 2020, the month previous to the lockdown, was 12,360 NIS (43,260 US dollars annually). This is eight percent lower than indicated by household expenditure survey data.[7] For an analysis of contract performance, changes in, rather than the levels of, the households' economic situation should matter most, so we focus on the changes engendered by the lockdown. Job loss, which for two adult households takes value 1 if both members lost a job between February and April, 0.5 if only one did, and zero otherwise, and with the obvious definition for single adult households, has mean 0.38. This drives much of household income loss, our primary explanatory variable in the main analysis. Respondents reported a mean 30 percent income decline, with a 30 percent standard deviation. This masks some very drastic losses: nine percent of respondent household suffered an income loss of more than 80%, while thirty percent suffered income loss of more than 40%. Nearly two-thirds (64%) of households are financial fragile, i.e., reported being unable to cover a one-time unexpected expense equal to twice their monthly contracted rent (about $2000) with cash.[8] The final row shows the interaction of financial fragility with the income cut.

Panel B describes lease terms and elements of the non-contractual landlord-tenant relationship. Monthly rent averages 3,680 NIS (about $1050), and on average there are 3.2 rooms. Forty one percent of leases stipulate that the tenant hand over post-dated cheques to the landlord at the start of the contract, fifty-nine percent require a security cheque and thirty-six percent a co-signer. The average tenure of the tenant, our first measure for the strength of the tenant-landlord relationship (e.g., Lagakos and Ordonez (2011)), is nearly three and a half years. Our second measure is frequent interactions, which indicates that the tenant encounters the landlord at least once a month, or (for three percent of the sample) is a second-degree or more relative of the landlord. (First degree cases, i.e., tenant and landlord are immediate family relatives, were screened out of the sample.) Its mean is 0.38. Finally, fourteen percent of tenants responded that rent is the main income of their landlord.

Panel C's demographic characteristics show an average respondent age of thirty-five, a partner for eighty-six percent of respondents, with sixty percent married (per the sampling frame), and eleven percent female with no partner. Half have no children. Half have a bachelors or higher degree. Panel D shows our main dependent variable, the share of rent paid. Its

[7] 2017 Household Expenditure Survey micro data, inflated by three percent to account for 1.5 annual per capita GDP growth, re-weighted for oversampling of married couples and allocated to intervals as in our survey, show renter net household monthly income of 13,440 NIS.

[8] Compare Lusardi et al., who report that half of US households could not raise $2000 in 2009, and Board of Governors (2020) which reports that 36% say they could not pay a $400 expense with cash or equivalent.

mean is 0.93. This is comprised of a majority (88.5 percent) of tenants who pay full rent, those paying partial rent (6.5 percent) and those paying no rent at all (five percent). The average share when partially paid is 66 percent.

Columns (3)-(6) split the sample by whether the household paid full rent in April or not. They show clearly that job loss, income shock, fragility, fewer guarantees, and a weaker landlord-tenant relationship are all associated with less than full rent being paid. Those failing to pay full rent earned thirteen percent less before lockdown, were fourteen percent more likely to lose their job and suffered a fourteen percentage point greater income cut with lockdown, and were twenty percentages points more likely to report financial fragility.

Contractual provisions and relationship indicators also differ substantially. Among those paying less than full rent, post-dated cheques are twenty, security cheques thirteen, and cosigners four percentages points less likely. Their tenure is a year greater and they are twenty-five percent more likely to frequently encounter their landlord.

In contrast, both contract rent and number of rooms are essentially equal between the two groups, as are the demographic characteristics. None of the mean differences for these variables are statistically significant. This similarity between the two groups gives us confidence that the set of remaining variables - the income and job shocks, financial fragility, contractual provisions and tenant-landlord relationship variables - are not correlated with other tenant characteristics unobserved by us such as to invalidate the causal interpretations we give to these variables' statistical association with our main dependent variable, the share of contract rent paid.

4 Estimation results

4.1 Income loss

We first lay out the determinants of household income loss suffered between February and April 2020. Column (1) of Table 2 regresses this on February 2020 employment status and demographic variables. Unsurprisingly, the employed suffered greater income loss than the non-employed (mostly retirees and students). Beyond that, lower income, less educated, younger and single households suffered greater income losses. These estimates are in line with U.S. research (Board of Governors, 2020) and Finance Ministry reports, lend credence to the survey response reliability.[9] Column (2) distinguishes between the wage/salaried workers and the self-employed, showing that the self-employed were especially hard hit, with a marginal 46 percent income cut. The self-employed's ineligibility for unemployment benefits probably explains the gap between salaried and self-employed individuals.

[9] www.gov.il/BlobFolder/dynamiccollectorresultitem/periodic-review-01062020/he/weekly_economic_review_periodic-review-01062020.pdf (in Hebrew)

Column (3) includes the job-loss variable only. It suffices to explain half as much of the income cut variation as the pre-Covid 19 employment status, income and demographic variables of the previous column, with a full household job loss responsible for a one third drop in income. This is not surprising since, other than for the self-employed (a small share of the sample), income loss presumably works mostly through job loss. Adding the demographic and income controls back in for Columns (4) and (5) increases the R-squared somewhat, but leaves the job loss coefficient little changed. As expected, the coefficient on the pre-Covid 19 income in Columns (4) and (5) is significantly smaller than in Columns (1) and (2). Yet that it is nonetheless still negative and significant, and that the demographic coefficients remain essentially as before, suggest that, among the non-self-employed, there was some income loss without employment loss, whether through wage reductions or non-labour income.

4.2 Rent payment

Table 3 begins our analysis of the share of April rent paid. Columns (1)-(4) show its regression on separate (sets of) variables of interest. Full income loss is associated with paying 8 percentage points less of rent due compared to households with no loss. Financial fragility is associated with a four percent greater rent reduction. Each guarantee raises the fraction of contracted rent paid: by five percent when the landlord holds post-dated cheques, by four percent for a security cheque, and by three percent for a cosigner. Strong tenant-landlord relationships reduce the share of rent paid: long tenure by three percent, and frequent interactions by five and a half percent.

Column (5) conditions on all these regressors at once, while Column (6) adds in a large set of additional controls: log rent, log income and an indicator for the rent being the landlord's main income, the household demographic controls from Table 1, and city fixed effects. Coefficient estimates are generally robust, with significance levels maintained across the columns. The notable exceptions is the cosigner indicator, which decreases in magnitude and becomes insignificant with the added controls.[10] Also, the coefficients for landlord's main income are positive and highly significant.[11]

As we should expect, in our context, payment to differ from that contracted for only when the economic environment changes, we interact our variables of interest with the income cut, surely the dominant change during this period. The last two columns begin this analysis by adding in the interaction between financial fragility and income cut, first with its main effects only (Column (7)), then with the remaining variables of interest and controls (Column (8)).

[10]The negative, and significant, coefficient on log rent suggests, given the city fixed effects, that rent reduction is greater when rent is high relative to the market.

[11]While this finding is robust and other results independent of its inclusion, we note that the variable is based on tenants' assessments, and that 49 percent of tenants reply "Don't Know" (which set the variable to zero). Accordingly, it should be interpreted cautiously.

Not only is the interaction term large and significant, its inclusion drives the main effects essentially, and fairly precisely, to zero. So financial fragility matters only when income is cut. Furthermore, income cut is associated with rent reduction only for financially fragile households. For those households, a complete loss of income is associated with an additional 12 or 13 percent reduction in rent.

Table 4 further examines how income cut, financial fragility and then either contractual guarantees or relationship measures affect the share of rent paid. It considers income cuts for fragile households only, so that income cuts and financial fragility only enter in interaction with each other. Panel A splits the sample according to the number of guarantees. Column (1), estimated on the sub-sample with zero guarantees, shows a financially fragile household with such a lease that loses all its income paying 22 percent less of contract rent than a household either financially robust or that suffers no income cut, significant at the 1 percent level. Moving across the columns, we see that this sensitivity falls with each additional provision, until in Column (4), with all three provisions, a full income cut is predicted to lead to only an insignificant four percent rent reduction. The intercept estimates imply that rent reduction for households with uncut income or financial robustness also falls monotonically, from eight percent, when the contract lacks any guarantees, to an insignificant one percent with all three.[12] The attenuation of the income cut sensitivity is explicable by truncation of the dependent variable at full rent: as conditions become less hospitable for seeking a rent reduction, there is less and less room for an increase in the income cut to generate greater reduction.

Columns (5)-(8) add the main effects of financial fragility and income cut, and the control variables used in Column 6 of Table 3, including the demographic and city fixed effects. The qualitative results remain the same, with less precise estimates on the interaction term, and small and insignificant main effects.

Panel B focuses on relationship strength. We now split the sample four-ways, by tenure and frequency of encounters with the landlord. As in panel A, we first consider the effect of the interaction of financial fragility and income cut alone. We see that households with the strongest relationship with their landlord (Column (4), i.e., long tenure and frequent encounters) clearly pay less than those with the weakest (Column (1), short tenure and infrequent encounters). This difference holds whether the household suffered an income cut under financial fragility or not. Also, longer tenure increases income cut sensitivity for those with infrequent encounters; precision is too low for reliable inferences on the remaining interactions. Columns (5)-(8) repeat the analysis, while controlling for main effects and the additional controls. Again, main effects are insignificant. The coefficients on the interaction term are generally larger than in Columns (1)-(4), but less precisely estimated. Here, frequent interactions

[12] These numbers rely on regression linearity, but match up with the actual mean share rent paid for households either financially robust or with no income cut: 0.91, 0.95, 0.97 and 0.99, in order of number of guarantees.

tend to increase the sensitivity to income cuts under financial fragility, but the increases are not significant.

In both panel A and panel B, we emphasize the estimates in Columns (1)-(4) given their greater precision, and given that Hausman tests (Hausman (1978)) fail to reject their consistency relative to their counterparts in Columns (5)-(8).

Our final analysis examines how guarantees and the relationship interact. Table 5 presents the mean share rent paid by number of guarantees and the relationship measures. Conditional on the relationship variables (within column), more guarantees implies a greater share paid. For instance, short tenure tenants who frequently meet their landlord pay, on average, 89% of their rent when there are no guarantees, but 98% of the rent with three guarantees. Conditional on the number of guarantees (within row), as the relationship becomes stronger a smaller share of the rent is generally paid, where there are no or only one or two guarantees. For instance, for leases with one guarantee, the average share rent paid falls from 95% when the relationship is weakest (short tenure and rare encounters) to 87% when the relationship is strongest (long tenure and frequent encounters).[13] However, when the landlord is most protected, having all three guarantees, the tenant does *not* benefit from a stronger relationship, paying, on average, nearly all rent due.

5 Interpretations

5.1 Bargaining and relational contracts

Our estimates allow us to gauge the importance of bargaining and relational contract factors, and other elements of the economic environment.

The absence of a significant income cut effect for the financial robust indicates that the short term response of housing demand to income shocks is insufficient to generate a sufficiently credible threat for rent reduction. The large and significant effect on the financially fragile points to tenant illiquidity as the core reason why income cuts lead to rent reduction. Possibly other housing demand shifts unobserved by us, originating in the move away from working or studying in central locations, or expectations of future income shocks, explain rent reductions for those with uncut income. However, those reductions could also be explained by market conditions moving sufficiently to push some tenants' breach payoffs above an unchanged contract utility.

Overall, our findings show that the legal doctrine of pacta sunt servanda, or 'agreements must be kept', does not of itself suffice to ensure agreements *will* be kept. Rather, guarantees that impose damages on the tenant under non-payment increase adherence. The nearly complete absence of rent reduction when all guarantees are present, even among the financial

[13]The one exception, of nine possible comparisons, is the shift from short to long tenure with zero guarantees.

fragile subject to income cuts, shows the potential of these contractual provisions to make breach unpalatable.

Relationships are important as well. We find both long tenure and frequent encounters between tenant and landlord to significantly abet rent reductions. As such, we are unable at this stage to choose among the various mechanisms - greater information, selection, social sanctions. Yet we can conclude that the magnitude of the relationship effects and the contractual provisions are similar. For instance, a tenant who frequently meets her landlord will pays about 5 percent lower rent, similar (with opposite sign) to the effect of a security cheque.

Notwithstanding the similar magnitudes, we find the most protected landlords unresponsive to tenant needs even for strong relationships. This suggests that, in this environment, relational factors come into play only if the tenant has a credible threat not to abide by the contract. This result should not be interpreted as meaning written provisions are more important than relational aspects (we have just noted otherwise), nor what one might observe for an extremely strong relationship. Our relational variables are gross measures; finer measures, which a larger sample size might allow, might have identified a strong enough relationship for rent to have been substantially reduced no matter the number of guarantees.

5.2 Unobserved heterogeneity

Our preferred interpretations are causal, with lease and relationship characteristics viewed as uncorrelated with unobserved tenant characteristics, conditional on our included controls. How reasonable are heterogeneity-based interpretations instead?

We consider two heterogeneous tenant hypotheses. An 'observable types' hypothesis has landlords demanding more guarantees of tenants who seem less likely to honour contractual commitments. If landlords have correct assessments, such tenant variation will make the share of contracted rent paid lower the more contractual provisions there are. We see the opposite. This suggests that any such heterogeneity bias is dampening our estimates, so that the true effect exceeds our estimate.[14]

A second heterogeneity hypothesis posits tenant types unobservable by the landlord. Then either tenants signalling their payment reliability or landlords screening them through a menu of offers can lead to reliable tenants agreeing to guarantees, as these provisions, which come with a lower contract rent, are less likely to be activated for this type (Benjamin et al. (1998)).

Although this type of heterogeneity is consistent with our findings, since then tenants with more lease guarantees would pay more of their contract rent, being more reliable, we can still ask if it is consistent with other patterns in the data. A standard asymmetric information

[14]Our regressions results condition on the income cut and fragility, whereas landlords would be concerned with the unconditional mean rent paid. However, the unconditional means are similar (as Table 1 hints at): mean share of rent paid is 0.87, 0.91, 0.96 and 0.98, for zero, one, two and three contractual provisions.

test asks whether contractual choices predict the outcome: e.g., does a high deductible predict fewer accidents (Chiappori and Salanie (2000))? Obviously, that is inappropriate here: we already know that contract provisions predict fewer non-payments, but our explanation is different. Instead, we ask whether an 'unreliability' proxy arguably unobserved by the landlord predicts fewer guarantees. Our chosen proxy is financial fragility. After all, fragile households are defined as those unable to pay a large expense in cash; unreliability is the probability of not paying rent.[15]

As it turns out, financial fragility is not significantly associated with the number of guarantees. The mean number of guarantees is 1.35 for the fragile, and 1.38 for the robust (p-value = 0.56); the two way classification likelihood-ratio test p-value is 0.20. Conditioning on characteristics arguably more observable to the landlord does not render fragility significant.[16] Thus we do not view this type of heterogeneity as explaining the contractual provision effects either.

In principle, heterogeneity might bias the tenure coefficient as well: the unreliable are less likely to have leases renewed, so short tenure will predict unreliability (Goodman and Kawai (1985), Guasch and Marshall (1987)). However, that argument predicts higher rent paid for longer tenure, opposite to our findings, and so, as before, implies a true tenure effect larger than our estimate. Note that this bias, driven by the unreliable paying less, differs from the relational contracts mechanism explored earlier, whereby the reliable pay less (not more), in agreement with a landlord confident of recouping the reduction, directly or through future higher contractual rent. Finally, signalling reliability by accepting a longer contract duration (Hubert (1995), Miceli and Sirmans (1999)) could not be empirically important, given the overwhelming majority of one year leases in the market.

6 Concluding remarks

The Covid-19 lockdown presents the economic system in extremis. With contracts written under one environment, and the lockdown slashing income under another, contracts inevitably will be under stress. We find full rent paid in most cases. Yet, in a significant minority of cases, it was not. How much was paid varies in clear ways with the household economic situation, contract provisions and the tenant-landlord relationship. We use bargaining and relational

[15]For a security cheque, 'reliability' may be 'not damaging the unit'; were that uncorrelated with payment reliability, no bias would arise from signalling. But one should not suppose zero correlation.

[16]We estimate the ordered-logit regression (odds-ratios shown)

$$\#of\ provisions = \underset{(0.10)}{0.94} \times fragility + \underset{(0.13)}{0.86} \times log(income) + \underset{(0.44)}{3.05} \times log(rent) + demographic\ controls, N = 1511 \tag{1}$$

The estimates are robust to excluding demographic controls.

contracts theories to interpret our results. A follow-up paper incorporating a second round survey currently being administered on the same sample will both delve more deeply into bargaining dynamics and explore the evolution of the tenant-landlord relationship, possibly including its dissolution, as the crisis unfolds.

At the time of writing, late June 2020, almost all lockdown restrictions in Israel have been lifted. Employment remains low, however, because of substantially reduced aggregate demand, both domestically and globally, and with resurgence in infections there is a threat of re-imposition of some restrictions. While we focus on Israel, difficulties in paying rent during the recent crisis have emerged in many countries and we expect our findings to be relevant elsewhere.[17]

[17]Conflicts over commercial lease payments have also arisen. It would be interesting to compare the two markets. See https://www.wsj.com/articles/landlords-fume-as-starbucks-other-chains-seek-extended-rent-cuts-11589889601. Contractual provisions, such as force majeure clauses, are central to those disputes as well.

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Table 1: Summary statistics

	All sample		Paid full rent		Didn't pay full rent		
	mean	sd	mean	sd	mean	sd	diff
Panel A: Renters' income and employment status							
Net income (Feb 2020)	12.36	4.94	12.56	4.96	10.88	4.48	-1.68***
Job loss (Apr 2020 vs. Feb 2020)	0.38	0.39	0.36	0.38	0.50	0.45	0.14***
Percent income cut	0.30	0.30	0.29	0.29	0.42	0.33	0.14***
Financially fragile	0.64	0.48	0.61	0.49	0.81	0.39	0.20***
Fragile $\times$ Percent income cut	0.23	0.30	0.20	0.29	0.38	0.35	0.18***
Panel B: Lease contract information and landlord-renter relationship							
Rent	3.68	1.32	3.69	1.32	3.64	1.30	-0.04
Number of rooms	3.20	1.03	3.20	1.02	3.21	1.11	0.02
Post-dated cheques	0.41	0.49	0.43	0.50	0.23	0.42	-0.20***
Security cheque	0.59	0.49	0.60	0.49	0.47	0.50	-0.14***
Cosigner	0.36	0.48	0.37	0.48	0.32	0.47	-0.04
Years since entered apartment	3.39	4.25	3.25	3.61	4.42	7.42	1.17***
Frequent interactions	0.38	0.49	0.35	0.48	0.60	0.49	0.25***
Rent is landlord's main income	0.14	0.35	0.13	0.34	0.24	0.43	0.11***
Panel C: Demographic characteristics							
Age	35.29	9.68	35.39	9.59	34.52	10.32	-0.88
Couple	0.86	0.35	0.86	0.35	0.84	0.37	-0.02
Married	0.60	0.49	0.60	0.49	0.55	0.50	-0.05
Single female	0.11	0.31	0.11	0.31	0.13	0.349	0.02
Has children	0.50	0.50	0.51	0.50	0.44	0.50	-0.06
Has BA	0.51	0.50	0.51	0.50	0.44	0.50	-0.07
Panel D: Share of rent paid in April 2020							
Share of rent paid	0.93	0.24	1.00	0.00	0.37	0.37	-0.63***
Observations	1511		1335		176		1511

Table 2: Determinants of income cut

	(1)	(2)	(3)	(4)	(5)
Employed (Feb 2020)	0.12				-0.01
	(0.03)				(0.03)
Log(income)	-0.13	-0.15		-0.07	-0.07
	(0.02)	(0.02)		(0.02)	(0.02)
Has BA	-0.05	-0.04		-0.04	-0.04
	(0.02)	(0.01)		(0.01)	(0.01)
Age<25	0.06	0.07		0.06	0.06
	(0.03)	(0.03)		(0.03)	(0.03)
Married	-0.05	-0.05		-0.06	-0.06
	(0.02)	(0.02)		(0.01)	(0.01)
Salaried (Feb 2020)		0.09			
		(0.03)			
Self employed (Feb 2020)		0.46			
		(0.04)			
Job loss			0.36	0.35	0.35
			(0.02)	(0.02)	(0.02)
R^2	0.06	0.15	0.22	0.26	0.26
Observations	1511	1511	1511	1511	1511

The table shows regression results in which the household income cut between April and February 2020 is the dependent variable. Column 1 shows that those employed experienced a 12 percent income cut. Also, younger, single, less educated and low-earning households were hit more. Column 2 further demonstrates that the self-employed were particularly hurt. In Columns 3-5 we use alternative specifications to show that income cut is mostly driven by job loss. The qualitative and quantitative effects of the demographic variables remain the same.

Table 3: Determinants of rent payment in April 2020

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Percent income cut	-0.08				-0.07	-0.07	0.02	0.03
	(0.02)				(0.02)	(0.03)	(0.03)	(0.03)
Financially fragile		-0.05			-0.03	-0.03	-0.01	0.00
		(0.01)			(0.01)	(0.01)	(0.02)	(0.02)
Post-dated cheques			0.05		0.04	0.05		0.05
			(0.01)		(0.01)	(0.01)		(0.01)
Security cheque			0.04		0.04	0.04		0.04
			(0.01)		(0.01)	(0.01)		(0.01)
Cosigner			0.03		0.02	0.01		0.01
			(0.01)		(0.01)	(0.01)		(0.01)
Frequent interactions				-0.06	-0.04	-0.05		-0.05
				(0.01)	(0.01)	(0.02)		(0.02)
Long tenure				-0.02	-0.02	-0.03		-0.03
				(0.01)	(0.01)	(0.01)		(0.01)
Log(rent)						-0.05		-0.05
						(0.03)		(0.02)
Log(income)						0.06		0.06
						(0.02)		(0.02)
Rent is landlord's main income						0.06		0.06
						(0.02)		(0.02)
Fragile × Percent income cut							-0.12	-0.13
							(0.04)	(0.05)
Demographic controls						✓		✓
City FE						✓		✓
R^2	0.01	0.01	0.02	0.02	0.05	0.20	0.02	0.21
Observations	1511	1511	1511	1511	1511	1511	1511	1511

The table presents OLS regression results in which the dependent variable is the share of rent paid in April 2020. In Column 1, we include the household income cut between April and February 2020. Column 2 includes only the financially fragile indicator, and in Column 3 we use the three contractual guarantees. In Column 4 we include long tenure (tenure $\geq$ 3 years) and frequent landlord-tenant interactions, the variables that measure the strength of the tenant-landlord relationship. In Column 5, all the variables used in previous specifications are included. In Column 6, we add demographic variables, locality fixed effects and the variables: log rent, log income and an indicator for whether rent is the the landlord's main income. In Columns 7 and 8, we repeat the estimation presented in Columns 1 and 6, respectively, except that we also add the interaction term between income cut and financial fragility.

Table 4: Rent payment, contractual guarantees and relationship strength

	Panel A: Contractual guarantees							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Number of guarantees in the lease							
	None	One	Two	Three	None	One	Two	Three
Fragile × Percent income cut	-0.22	-0.12	-0.07	-0.04	-0.36	-0.07	-0.10	0.01
	(0.07)	(0.04)	(0.03)	(0.03)	(0.17)	(0.11)	(0.07)	(0.04)
Percent income cut					0.07	0.00	0.03	-0.01
					(0.13)	(0.09)	(0.06)	(0.04)
Financially fragile					0.02	-0.00	0.03	-0.03
					(0.09)	(0.04)	(0.03)	(0.03)
Constant	0.92	0.94	0.97	0.99	0.82	1.01	1.01	1.05
	(0.02)	(0.01)	(0.01)	(0.01)	(0.35)	(0.18)	(0.11)	(0.11)
Additional controls					✓	✓	✓	✓
R^2	0.04	0.02	0.01	0.01	0.47	0.20	0.28	0.43
Observations	283	571	488	169	283	571	488	169
	Panel B: Relationship strength							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Tenure duration and frequency of encounters							
	Short		Long		Short		Long	
	Rare	Freq	Rare	Freq	Rare	Freq	Rare	Freq
Fragile × Percent income cut	-0.07	-0.11	-0.15	-0.11	-0.16	-0.25	-0.14	-0.25
	(0.04)	(0.05)	(0.05)	(0.07)	(0.07)	(0.13)	(0.08)	(0.28)
Percent income cut					0.06	0.05	0.00	0.12
					(0.05)	(0.10)	(0.04)	(0.22)
Financially fragile					0.02	0.06	-0.00	0.09
					(0.03)	(0.06)	(0.03)	(0.12)
Constant	0.97	0.93	0.97	0.89	0.55	0.84	1.15	0.85
	(0.01)	(0.02)	(0.01)	(0.02)	(0.22)	(0.18)	(0.19)	(0.56)
Additional controls					✓	✓	✓	✓
R^2	0.01	0.02	0.04	0.01	0.30	0.31	0.39	0.33
Observations	516	359	421	215	516	359	421	215

Table 5: Share rent paid by contractual guarantees and relationship measures

		Short tenure		Long tenure	
		Rare	Frequent	Rare	Frequent
	No. of guarantees				
Mean		0.89	0.87	0.9	0.82
Standard error	None	(0.05)	(0.03)	(0.03)	(0.04)
Observations		43	95	80	65
Mean		0.95	0.88	0.93	0.87
Standard error	1	(0.02)	(0.02)	(0.02)	(0.03)
Observations		186	147	145	93
Mean		0.97	0.95	0.96	0.9
Standard error	2	(0.01)	(0.02)	(0.02)	(0.04)
Observations		208	92	144	44
Mean		0.98	0.99	0.98	0.99
Standard error	3	(0.01)	(0.01)	(0.02)	(0.01)
Observations		79	25	52	13

The table shows the mean share rent paid and its standard error for each combination of the number of contractual guarantees (post-dated cheques, cosigner and security cheque) in the lease and the variables that measure the strength of the landlord-tenant relationship (short/long tenure and rare/frequent encounters). The number of observations in each cell is also given. For instance, there are 208 households with 2 contractual guarantees, short tenure and infrequent (rare) landlord-tenant interactions. These households pay 97 percent of the rent in April 2020.