

Online Supplement for  
“Unlikely Expropriators: Why Right-Wing Parties Implemented Agrarian Reform in  
Democratic Brazil”

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This supplement offers additional estimates of confidence for the argument presented in the manuscript using Bayesian updating. Process tracing methodologists highlight the benefits of adopting a formal Bayesian approach (see Fairfield and Charman 2017, also Barrenechea and Mahoney 2019, Bennett 2008, Humphreys and Jacobs 2015). Such an approach consists of updating the level of confidence in a causal argument by assessing the likelihood of data in light of working and alternative hypotheses (see Fairfield and Charman 2017 for a full outline of Bayesian updating in case studies).

In the present study, the proposed theory  $T_1$  states that fear of urban crime and the electoral competition from the left triggered right-wing parties' coordination in favor of the agrarian reform project. In order to update the confidence in  $T_1$  I formalized four plausible and mutually exclusive rival hypotheses. These are:

*T<sub>2</sub>*: Agrarian reform occurred due to the landless movement's (MST) strategic usage of public

support following extensive press coverage of rural violence.

$T_{a_{ii}}$ : Agrarian reform occurred because it was market friendly and harmless to landed elites.

$T_{a_{iii}}$ : Agrarian reform occurred because of President Cardoso's ideological commitment.

$T_{a_{iv}}$ : Agrarian reform was caused by long-term historical processes initiated in the 1950s.

If one of these alternative hypotheses is true, then agrarian reform would have occurred regardless of fear of crime and competition with the left, making the counterfactual assumptions derived from  $T_I$  false and consequently  $T_I$  false altogether (see Humphreys and Jacobs 2015 for a discussion on counterfactuals in case studies).

Departing from a state of complete ignorance in which all hypotheses are equally likely, the initial probability ratio for each is  $\frac{1}{5}$ , or 20%. Therefore the prior confidence in  $T_I = False$  is 80%, for confidence in  $(T_{a_i} \vee T_{a_{ii}} \vee T_{a_{iii}} \vee T_{a_{iv}}) = True = 0.8$ . This implies a prior assessment in which the odds of  $T_I$  being false is 75% greater than the odds of  $T_I$  being correct, for  $\frac{Pr(T_I)}{Pr(T_{a_i} \vee T_{a_{ii}} \vee T_{a_{iii}} \vee T_{a_{iv}})} = 0.25$ .

From this prior low level of belief in  $T_I$ , the likelihood ratio is updated by accounting for the observed evidence  $K$ . This updating process is formalized as

$$\frac{Pr(T_I|K)}{Pr(T_a|K)} = \frac{Pr(T_I)}{Pr(T_a)} \times \frac{Pr(K|T_I)}{Pr(K|T_a)}$$

where  $T_a$  represents each alternative hypothesis. I estimate the likelihood of the evidence  $K$  in light of

$T_I$  and  $T_a$  in Table S1.

**Table S1: summary of the likelihood of  $K/T$**

$K$	$\Pr(K/T_i)$	$\Pr(K/T_{a_i})$	$\Pr(K/T_{a_{ii}})$	$\Pr(K/T_{a_{iii}})$	$\Pr(K/T_{a_{iv}})$
Statements by landed elites against AR	<i>High</i>	<i>High</i>	Low	<i>High</i>	<i>High</i>
Statements associating agrarian reform and urban crime	<i>High</i>	Low	Low	Low	Low
Statements highlighting the cost-efficiency of AR vis-à-vis other policies	<i>High</i>	Low	<i>High</i>	Low	Low
Elites' endorsement of AR before 1995	<i>High</i>	Low	<i>High</i>	Low	Low
Endorsement of AR by rival conservative candidates in 1994	<i>High</i>	Low	<i>High</i>	Low	Low
Cardoso's notes on competing with the left	<i>High</i>	Low	Low	Low	Low
Lula's plagiarism accusations	<i>High</i>	Low	Low	Low	Low
Distribution of expropriations in time	<i>High</i>	<i>High</i>	Low	Low	Low
Distribution of expropriations in space	<i>High</i>	Low	Low	Low	Low

AR stands for agrarian reform

The probability of the set of evidence  $K$  is different for each hypothesis. For instance, the statements by landed elites against agrarian reform are only unlikely in light of  $T_{a_{ii}}$  as the latter states that the policy was neoliberal and harmless to landowners. Three other sets of evidence are likely, or expected, if  $T_{a_{ii}}$  were to be the true explanation: it is likely to observe elites' early endorsement, their arguments on the relative cost of the policy vis-à-vis other welfare policies, and the subsequent support for diverse right-wing parties if the policy was indeed neoliberal and innocuous to the representatives of landed elites.

Those pieces of evidence are in turn highly unexpected if the other alternative explanations are true, but likely if  $T_l$  or  $T_{a_{ii}}$  are true. According to  $T_l$ , elites cooperated early on because agrarian reform lowered the costs of redistribution.

The temporal distribution of expropriations is highly likely if either  $T_l$  or  $T_{a_i}$  is true, as both theories predict increased coordination in favor of agrarian reform throughout the 1990s. According to  $T_l$ , coordination was triggered by fear of crime and competition with the left. According to  $T_{a_i}$ , it was triggered by pressures from the MST following positive press coverage. The spatial distribution of expropriations however is much more likely if  $T_l$  is true, as Itamar and Cardoso were expected to target localities in which Lula performed well and within the states of origin of migrants, mainly in the Northeast, if  $T_l$  is correct. In effect, the skewness of the spatial distribution of farm expropriation in favor of localities where migrants originated from and where Lula received a high number of votes is highly unlikely considering any of the alternative hypotheses as true.

The observations accounting for how elites associated agrarian reform and urban crime, the nature of Cardoso's private notes, and Lula's reaction are also unlikely pieces of evidence if one assumes any of the alternative explanations to be true. They are extremely likely if  $T_l$  is true.

The data indicate that  $Pr(K/T_l) > Pr(K/T_a)$  in  $\frac{4}{5}$  of the sets of evidence and  $Pr(K/T_l) = Pr(K/T_a)$  in the remaining  $\frac{1}{5}$ . From the latter it is derived that the posterior odds of  $T_l$  are greater than those of

rivals, as  $\frac{Pr(T|K)}{Pr(Ta|K)} = \frac{Pr(T)}{Pr(Ta)} \times \frac{Pr(K|T)}{Pr(K|Ta)} > 1$ . Considering that the likelihood of the evidence is on average high given  $T$ , and more often low given alternatives, it can be concluded that the updated likelihood ratio is in effect much greater than 1, i.e. that the data is significantly better predicted by  $T$ . In what follows I address each alternative hypothesis in greater detail.

**Update 1:**  $\frac{Pr(T)}{Pr(Ta)} \times \frac{Pr(K|T)}{Pr(K|Ta)}$

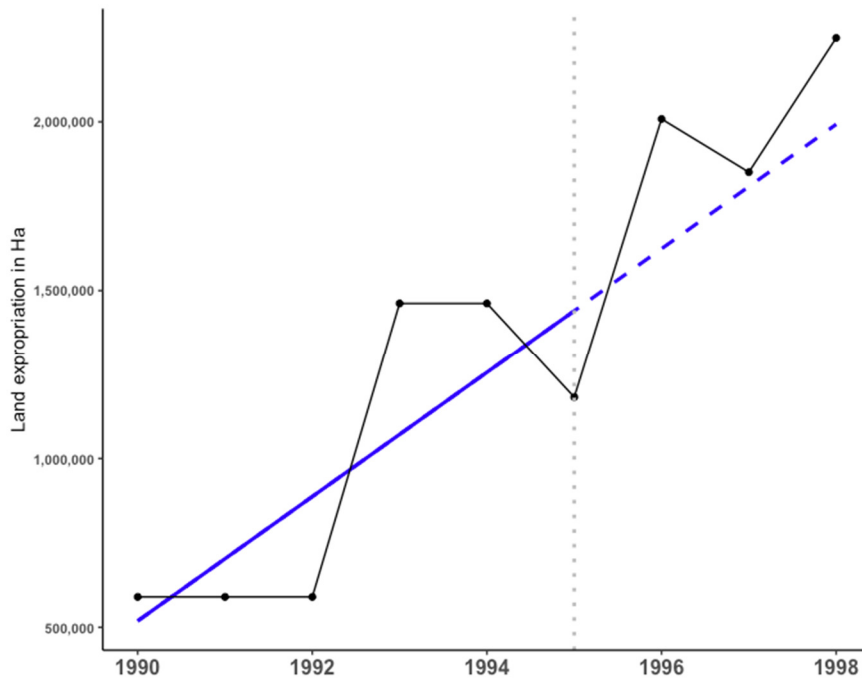
*T<sub>a</sub>*: Agrarian reform occurred due to the landless movement's (MST) strategic usage of public support following extensive press coverage of rural violence.

This alternative is based on Ondetti's (2010) model for why agrarian reform occurred under right-wing administrations. This rival model implies a chain of causal conditions, which together account for expropriations. As Ondetti notes, the massacres of Corumbiara and, more prominently, of Eldorado dos Carajás received ample press coverage, giving visibility to the MST. The movement then strategically expanded its operations in a context of shifting public opinion in favor of agrarian reform, pressuring the government to implement expropriations. A key piece of evidence in Ondetti's study is the peak in land expropriation following the massacres of 1995 and 1996, which is portrayed as being caused by the described chain of events.

The increase in expropriations after 1996 is very likely if *T<sub>a</sub>* is true because the theory predicts that,

due to issue salience, more expropriations should occur after the massacre of Eldorado. On the other hand, if we were to predict the amount of expropriations after 1995 knowing only the amount of expropriations in previous years (i.e. relying on a simple bivariate model), we would predict expropriations in 1996, 1997, and 1998 with a high level of precision, as shown in Figure S1 .

Figure S1: Predicted expropriations after 1995 based on data prior to 1995



In effect, the model would almost perfectly predict the amount of land expropriated in 1997, one year after the Eldorado dos Carajás massacre. Therefore, the expropriations observed after 1995 are also highly compatible with  $T_b$ , i.e. they are compatible with causes of agrarian reform located early on in 1993. Consequently, the evidence is as likely if  $T_l$  is true as if  $T_{a_i}$  is true.

The increase in press coverage after the massacres is very likely if  $T_{a_i}$  is true, but not less likely if  $T_l$  is true. According to  $T_b$ , the focus on rural inequality, rather than on other dimensions of inequality, followed a deliberate strategy of cost allocation by elites reacting to the threats of urban violence and competition with the left. Violence against the MST therefore allowed elite coalitions to make a stronger case for a policy that they were already supporting. Because elites in media conglomerates were members of the broader coalition sustaining both Itamar and Cardoso, they framed the agrarian

question in a way that was favorable to the government's program. Therefore, press coverage is also as likely in a world where  $T_{a_i}$  is true as in one where  $T_l$  is true, which accounts for no updating in the posterior probability of either theory. This does not exclude the possibility that the Eldorado massacre was the cause of particular aspects of the policy. For instance, the administration framed the PRONAF program intended to finance small family estates as a direct response to rural violence. Whereas pivotal points of violence against the MST may have caused aspects of the policy later on, they remain an unlikely cause of the right's decision to sponsor agrarian reform policies in the early 1990s.

The new evidence portrayed in the present study shows (i) the association between elites' concern over urban violence and support for agrarian reform in a variety of archival and interview data, (ii) how elites considered agrarian reform to be less costly than other welfare policies, (iii) how Cardoso was advised to adopt an agrarian reform platform in the face of the 1994 elections in order to beat Lula, (iv) how Cardoso emphasized competition with the left in his private notes on agrarian reform, (v) how the leaders of other conservative parties embraced similar discourses, and (vi) how Lula acknowledged that the PSDB was strategically building on PT's agenda. This body of evidence is much more likely if  $T_l$  is true than if  $T_{a_i}$  is true.

Furthermore, if  $T_{a_i}$  is correct in affirming that violence against the MST was the main trigger for the reform, we should observe references to this factor early on in the policy-making process. Looking only at data from the period prior to the first 1995 massacre, there are 5 statements from party elites framing agrarian reform as a solution to crime and demographic pressures, 4 statements associating the policy



with competition with the left, and 0 statements emphasizing violence in the countryside. This evidence is extremely unlikely if rural violence triggered concern over the agrarian question and extremely likely if the mechanisms portrayed in  $T_I$  are the correct ones. Confidence in  $T_{a_i}$  should be updated to a quantity that is lower than the prior level of 20% and confidence in  $T_I$  should be updated upward. The resulting ratio is now  $\frac{Pr(T_I|K)}{Pr(T_{a_i}|K)} = C_i > 1$ , favoring  $T_I$ .

**Update 2:**  $\frac{Pr(T_I)}{Pr(T_{a_i})} \times \frac{Pr(K|T_I)}{Pr(K|T_{a_i})}$

$T_{a_i}$ : Agrarian reform occurred because it was market friendly and harmless to landed elites.

Researchers and critics of agrarian reform in Brazil often dispute the relevance of land expropriation and redistribution, portraying the program as market friendly and innocuous to landed elites. A term sometimes used is “market-led agrarian reform” (Borras 2003, de Medeiros 2007, Wolford 2005). One “market-led” policy within the context of agrarian reform was the implementation of the Land Bank (*Banco da Terra*). The bank helped peasants acquire land through mortgages instead of granting them land directly (see also Pereira A 2003, Pereira J 2015, Wolford 2005). The World Bank’s support for agrarian reform programs is often considered as evidence of the policy’s market friendliness (Borras 2003). Authors also highlight how collusion between landed elites and state technocrats accounted for distorted compensations over expropriations which at times surpassed market value, making being expropriated good for business (Alston et al. 1999, Borin 1997, Sorj 1998). A powerful alternative

hypothesis is therefore that agrarian reform was endorsed by right-wing parties because it was compatible with the government's neoliberal playbook and because it was not harmful, or was even beneficial, to landed elites.

I found no evidence in the data of elites associating agrarian reform with the set of market reforms implemented by the Itamar and Cardoso administrations. The only reference to the World Bank in the dataset goes in the opposite direction. On August 12, 1994, *Folha de SP* reported that World Bank officials were pressuring the government to block the expropriation of four land sites in the state of Rondônia. The Bank sided with NGOs in claiming that settlements there would have a negative environmental impact. According to the data, only members of the agrarian caucus pressured the government to expand the financialization of the program through mortgages. Despite their pressure, less than 11% of agrarian reform beneficiaries in that period acquired land through the “market-led” aspect of the reform (Ondetti 2008). The policy choices by Itamar and Cardoso are centered on expropriation by decree and provide a minimal role for credit policies. In effect, the agrarian reform program was built after legislation presented by a PT lawmaker in 1991. The PT, whose motto of opposition to PSDB was based on its opposition to neoliberalism, did not frame the agrarian reform program as neoliberal. All the above information is much more likely if  $T_1$  is true.

The second implication of  $T_{a_{ii}}$  is that landed elites were not threatened by the program, once the policy provided for generous compensations by INCRA, the governmental agency in charge of expropriations. In a world where  $T_{a_{ii}}$  is true, we would expect to observe support or indifference from

landed elites in regards to the agrarian reform program. However, the data show that they actively opposed agrarian reform and threatened to abandon the government coalition. This evidence is very likely if  $T_1$  is true, as it accounts for urban conservative elites sacrificing the interests of landed elites in order to shield themselves from the externalities of inequality. In contrast, the evidence is highly unlikely if it is true instead that landed elites were not hurt by agrarian reform. The formation of UDR early in the 1980s to defend landed interests is also very unlikely in the absence of a significant threat, as was the collaboration between landed elites in the agrarian caucus in Congress in the 1990s.

What the data show is that the members of the agrarian caucus, who were mostly partisans from PSDB, PFL, PTB, and PPB, were vocal in their opposition to the bills that regulated agrarian reform. They argued that landed elites received different treatment compared to other business sectors (see quote by Congressman Nelson Marquezelli in the article) and accused their own parties of demagoguery because partisans were punishing farmers in order to mitigate distributive conflict instead of focusing on urban problems. Below are additional quotes that illustrate their opposition.

“I was born on a farm where my father established himself at the dawn of the century... Now I am witnessing these men in suits, who know nothing about agriculture, come with this cheap talk. I have been in conversation with the men of the countryside and have promised to work on this matter... expropriations are compensated with rotten bonds... Meanwhile, politicians did not have the guts to pursue urban reform. If the workers have the right to have land, the families should have the right to have a home.

Right here in front of the building where I live in Super Quadra 29 there are homeless families in the street. Soon the PT will propose the invasion of apartments with spare rooms to accommodate these people. It so happens that they do not have the guts to take on urban reform, which is much more pressing.”

Lúcio Coelho (PSDB) on the floor of the Senate, October 24, 1995.

“Farmers are scared of investing in production. They do not trust that their land, a deep rooted asset, will continue to be passed on from father to son.”

Fábio Meirelles, President of the Agriculture Federation of São Paulo, quoted in December 5, 1995 edition of *Folha de SP*.

“We cannot punish the farmers. Among us there are senators who are farmers and they will have to sell their land for ten times less than what INCRA is paying. Land is now worthless. Farmers are being punished.”

Júlio Campos (PFL) on the floor of the Senate, November 11, 1996.

The quotes show how landed elites and their representatives in Congress opposed agrarian reform and resented elites’ rallying around the program. The last quote suggests that the price distortions that ameliorated the impact of agrarian reform on expropriated farmers were also a source of concern to other landed elites. They would rather see the government investing in subsidies to agribusiness than receive inflated compensations and were deeply resentful of the focus on agrarian reform. The evidence

is extremely unlikely if landed elites and the agrarian caucus were in effect beneficiaries of agrarian reform or did not feel threatened by it. Meanwhile, the evidence is very likely in light of  $T_I$ . The updated or posterior probability of  $T_I$  therefore increases while the posterior probability of  $T_a$  decreases. The likelihood ratio should therefore be updated as  $\frac{Pr(T_I|K)}{Pr(T_{aII}|K)} = C_{II} > C_I > 1$ .

**Update 3:**  $\frac{Pr(T_I)}{Pr(T_{aIII})} \times \frac{Pr(K|T_I)}{Pr(K|T_{aIII})}$

$T_{aIII}$ : Agrarian reform was caused by President Cardoso's ideological commitment.

Another alternative explanation ( $T_{aIII}$ ) for agrarian reform rests on the exceptional leadership of President Fernando Henrique Cardoso, credited by some as having astutely implemented progressive policies through a victorious conservative coalition (Martins 2000). The idea of Cardoso having a personal ideological commitment to land redistribution is credible because of his credentials as a former Marxist scholar of development. Notwithstanding its plausibility, there is nothing in the data to corroborate this hypothesis.

The private notes in Cardoso's diary do not suggest strong ideological commitment to agrarian reform, but rather how the policy was instrumental in counterbalancing his image as a neoliberal politician against the left-wing opposition. Moreover, virtually all of Cardoso's rival presidential candidates in 1994 championed agrarian reform in their campaigns, including of course Lula who came in second.

The 1993 Agrarian Law was in effect by 1994, making the promise of implementing agrarian reform one relatively easy to fulfill. The above suggests that agrarian reform would have remained in the agenda after 1994 regardless of Cardoso's victory. These observations are extremely likely if  $T_i$  is true and very unlikely if  $T_{a_{iii}}$  is true. The likelihood ratio should therefore be updated as  $\frac{Pr(T_i|K)}{Pr(T_{a_{iii}}|K)} = C_{iii} > C_{ii} > C_i > 1$ .

**Update 4:**  $\frac{Pr(T_i)}{Pr(T_{a_{iv}})} \times \frac{Pr(K|T_i)}{Pr(K|T_{a_{iv}})}$

$T_{a_{iv}}$ : Agrarian reform was caused by long-term historical processes initiated in the 1950s.

A fourth and final hypothesis which would make  $T_a$  true rests on a macro-historical perspective in which the political decisions of the right-wing administrations of the 1990s are determined by long-term causes originating with the rural guerillas of the 1950s, or even prior to that, considering how intellectuals and social scientists endorsed the policy since the 1930s (da Costa Lopes 2020). It is true that agrarian reform had been a pressing issue for decades in Brazil, and that even the military regime had tried to implement an agrarian reform project. The agrarian question can be traced back to the abolition of slavery in 1888, when masses of freed persons were left without any formal access to land in the countryside, or even prior to that in 1850 following the first land law in favor of latifundia. However, this path-dependence set out the problem rather than explaining why the right finally decided to solve it. It is hard to test a macro-historical argument, which portrays agrarian reform as

overdetermined. One way of testing this macro-historical argument is to question the timing of the outcome, i.e. how likely it was for agrarian reform to occur when it did and not sooner. Assuming  $T_{aiv}$  to be true, it seems as likely to observe the event of agrarian reform in the 1990s as at any other point in time in recent history. Given constant macro-historical pressures since at least the 1950s, the probability of observing the regulation of agrarian reform in 1993 and not before is 1/43, or 2%. Meanwhile, it is very likely for agrarian reform to have occurred when it did, assuming  $T_I$  to be correct. This is because the causal mechanisms portrayed by  $T_I$  were not conjointly present during the military regime or during the democratic and autocratic periods that preceded it. Meanwhile, the gathered evidence is not particularly likely if  $T_{aiv}$  is true, with the exception of the opposition from landed elites, the historical agents of backwardness in macro-historical accounts. Therefore, the likelihood ratio regarding the posterior probabilities of  $T_I$  and  $T_a$  should be  $\frac{Pr(T_I|K)}{Pr(T_{aiv}|K)} = C_{iv} > C_{iii} > C_{ii} > C_i > 1$ .

## Conclusion

Overall, the updated confidence in  $T_I$  is positive in light of the probability of the body of evidence  $K$  given  $T_I$  and  $T_a$ . Just how more confident one can be about  $T_I$  depends on the quantities imputed for each likelihood, which in process tracing is a subjective assessment (Fairfield and Charman 2017). One can objectively say, however, that  $\frac{Pr(T_I|K)}{Pr(T_a|K)} = \frac{Pr(T_I)}{Pr(T_a)} \times \frac{Pr(K|T_I)}{Pr(K|T_a)} = C_{iv} > C_{iii} > C_{ii} > C_i > 1$ .

The multiple sources of data in the study suggest a very high posterior probability of  $T_I$  being true,

indicating high confidence in the theory. Fear of crime and competition with the left are therefore very likely the causal mechanisms that triggered the regulation and implementation of agrarian reform by conservative coalitions.

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