Macro Keys

Brazil: Proposing an UBS election polls aggregator

Economics

Americas

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It is all about elections

In less than five months, Brazil will hold presidential elections. The first round of the presidential election will be held on 2 October; if no candidate reaches 50% +1 of valid votes, there will be a second round of voting on 30 October, following which the next President of Brazil will be declared.

There is a plethora of polls being released, with traditional polling institutes and newcomers all providing polling numbers for both rounds. However, the candidates have not yet been determined; by law they will be officially announced in early August.

But according to a number of political consultants, polling specialists and media pundits, the main contenders are widely known. They are: 1) sitting President Mr. Jair Bolsonaro; 2) former President Mr. Luis Inácio Lula da Silva (Lula); 3) former governor and former minister Mr. Ciro Gomes; and 4) former governor of São Paulo Mr. João Doria.

There are several other potential candidates, but in every poll published so far they would have less than 3% of votes, so we aggregate them in 'others' for the purpose of this study. Sergio Moro withdrew his pre-candidacy and, for practical purposes, all candidates other than the four named above, will appear as 'other' in our analysis throughout this report.

Different polls/methodologies: how can we aggregate and what can we learn?

There are many different polls being produced in Brazil with different methodologies, processes of collecting data, and sample sizes. In the US, Nate Silver's blog "FiveThirtyEight" aggregates different polls for US elections, tries to determine an aggregate by combining all the polls, and releases his results here. Inspired by his work, we have spent the last month studying and selecting different methodologies for the best unbiased aggregation we could produce.

In Part I of this report, Fabio Ramos studied different aggregation methodologies and produced an assessment of where we are in terms of vote intentions for the first round, as well as an aggregator for the second round with only President Bolsonaro and former President Lula, who are by far the two leading candidates in every poll released to date. In Part II, we analyse the results and comment on possible biases in the results we observed.

This report has been prepared by UBS Brasil CCTVM S.A.. **ANALYST CERTIFICATION AND REQUIRED DISCLOSURES, INCLUDING INFORMATION ON THE QUANTITATIVE RESEARCH REVIEW PUBLISHED BY UBS, BEGIN ON PAGE 14.**

Part I: Election polls aggregator implementation

Polling and elections

We have seen in past years an increase in public opinion surveys and polls worldwide, given the advances in technology and reduced cost of polling. In election seasons, the demand from analysts, political commentators, the press and the overall population is even higher, and the Brazil presidential elections this year are no exception.

Processing a lot of information

Based on the 12 currently available public polls (we expect this number to grow) and considering their different methodologies, we propose an "aggregator" to extract what they have in common. Most show comparable trends, but with different confidence intervals, numbers of interviewed electors, interviewing days, publication frequency and type of interview (by phone or internet survey, in person or visiting households). We have gathered the last two years of publicly available data for these polls and detail their main characteristics in the Appendix.

Aggregator methodology

We have implemented a state-space model to summarize what polls show as a whole. It is not an inference about the election's final outcome, but simply a way to better compare and read a profusion of not exactly compatible data. We used the same method for the likely main scenario according to current polls for both the first round and run-off.

2022 election

Brazilians will go to the voting booths on 2 October to elect the President, a third of the Senate, the entire Lower Chamber, all 27 governors, and local legislatures. If no candidates for the Presidency or the governorships (the 'major positions') receive 50% + 1 of valid votes (meaning more than the sum of all other candidates), a second round of voting will take place on 30 October. Based on the official schedule, we have summarized the key dates in Figure 1 below. In fact, this report is an update and development on our September 2021 note (see Early thoughts for 2022).

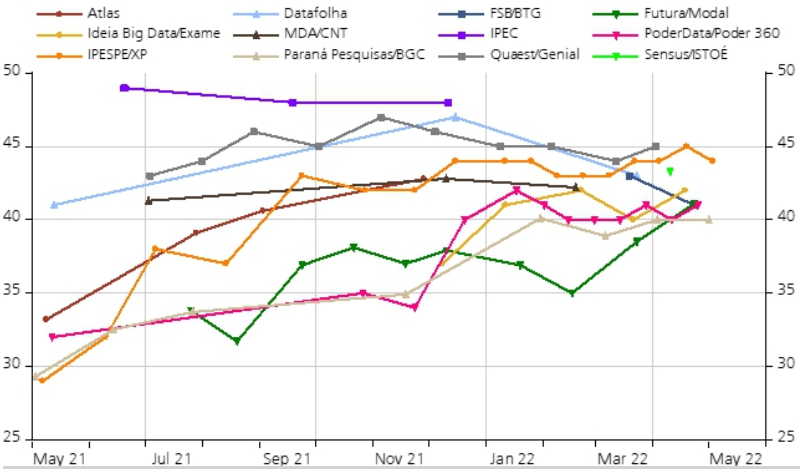
Figure 1: Brazil's elections key dates

August 5	Deadline for party conventions
August 15	Deadline for candidates enrollment
August 16	Beginning of official campaign
September 29	Last day for electoral debates and first round TV campaign
October 2	First round elections
October 7	Start of second round TV campaign
October 28	Last day of second round TV campaign
October 30	Second round elections
January 1, 2023	Presidential inauguration

Source: gov.br, TSE, UBS

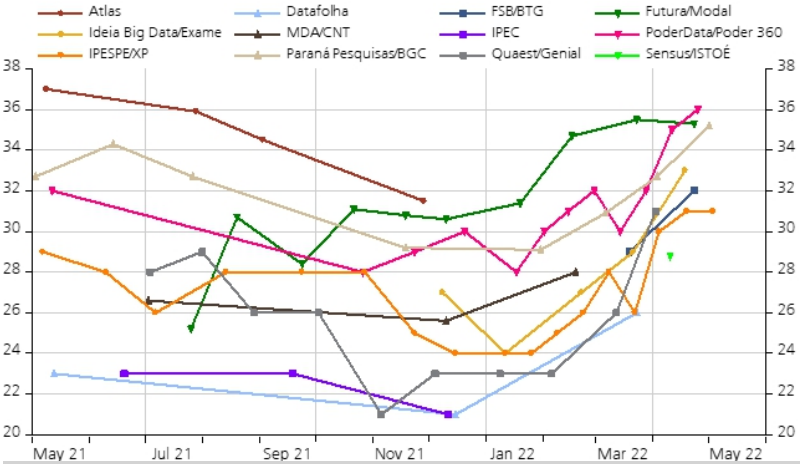
Just as an example, Figures 2-3 show a snapshot of the first round voting intentions for the two current front-runners, the incumbent President Bolsonaro and former President Lula, in all 12 polls. We note that at present, all names are considered "pre-candidates" since candidates' official registration with the electoral court occurs in August (deadline of 15 August).

Figure 2: Former President Lula first round voting intentions (%)



Source: Atlas, Datafolha, Futura, FSB, Ideia Big Data, MDA, IPEC, PoderData, IPESPE, Paraná Pesquisas, Quaest, Sensus, UBS

Figure 3: President Bolsonaro first round voting intentions (%)



Source: Atlas, Datafolha, Futura, FSB, Ideia Big Data, MDA, IPEC, PoderData, IPESPE, Paraná Pesquisas, Quaest, Sensus, UBS

The first thing we would note is the data dispersion, most likely due to the different methodologies of the polls. Our objective in this report is to develop and apply a method to consider different polls without any prejudgment in terms of saying which poll is 'good' or 'bad'. In a way, the goal is to determine if it is possible to find a common trend between all the polls, letting the data 'speak' and avoiding rules of thumb and controversial adjustments like simple interpolation, and taking simple moving averages from not exactly compatible polls.

The election polls aggregator

Proposing an aggregator to summarize a group of polls into a single metric is not straightforward. Further, in each electoral cycle new pollsters join or leave the market, and from time to time we get notice of new polling methods.

More and more surveys are being made through electronic calls, but some polls continue to interview people on the streets or at their homes. The former method is more common and usually less expensive. The latter methods are usually more expensive, but they also usually provide more statistically robust results, particularly if an analyst is interested in the candidates' levels of support instead of voting dynamics in a period of time.

Polls might be good to infer a candidate's level of support, but we stress that even a not-so-good survey in terms of stratification or number of interviewees may provide useful information if conducted with some frequency and with the same methodology. Most importantly, we think it is necessary to use all available data and let some econometric method decide which information is really significant or not.

To do so, we implemented what we call a linear Kalman filter state-space model[1] in which an observable voting intention "y" for each candidate "i" in a given pollster "j" in a given moment of time "t" takes the following form:

$$(1)\quad y_{i,j,t} = Z_{i,t} + \epsilon_{i,t}\,;$$

$$(2)\quad Z_{i,t} = Z_{i,t-1} + v_{i,t}\,;$$

$$\epsilon_{i,t} \sim N\left(0; \sigma_{\epsilon,i}\right);$$

$$v_{i,t} \sim N(0; \sigma_{v,i})$$

The variable "$Z_{i,t}$" is an unknown and we call it a "state" variable. In our case, we can call $Z_{i,t}$ a line which captures a pattern among all polls for each candidate "i", and we take for granted well-behaved disturbances, following a Normal distribution.

The more data that is available, the more the system should be able to detect if they are informative or not to the common pattern. And herein lies a resemblance with principal component analysis (PCA). However, standard PCA requires a full data panel. This is not the case with the Kalman, which is useful in dealing with missing values and non-regular data—which is typically the case in public opinion surveys.

The biggest disadvantage is that the estimate is highly sensitive to initial conditions, variables covariances and, as usual, the model structure itself. We preferred to keep "$y_{i,j,t}$" as simple as possible, since with 12 polls and several candidates the number of parameters to be estimated is about 80. Polls that are more affine/correlated tend to push the system solution (the trend) towards them. More volatile polls usually lose 'power' over the common line. Finally, more frequent polls also gain 'power' over the system.

We tracked voting intentions for the abovementioned four front-runners:

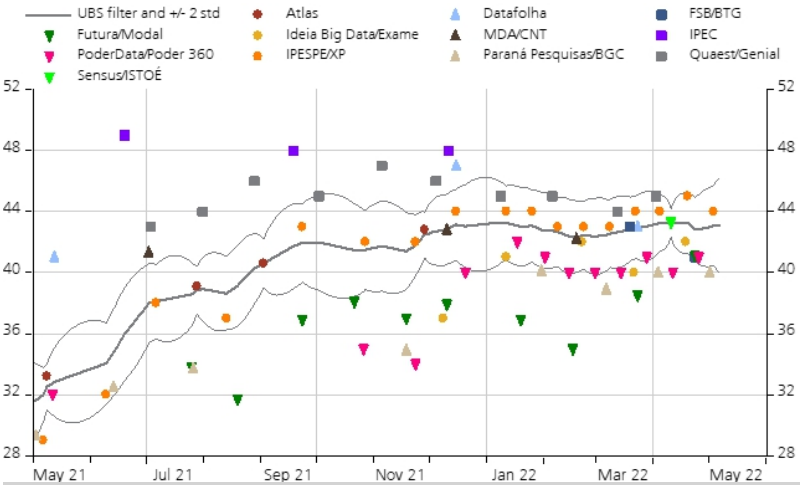
1. The incumbent, President Bolsonaro (from the PL party);
2. Former President Lula (2003-2010, from the PT party);
3. Ciro Gomes, former Ceará state governor (PDT); and
4. João Doria, former São Paulo state governor (PSDB).

We included all other potential (and former) candidates in the "Others" category. We also added a group with "Blank, Null and Don't know or No answer".

Now, we can reassess Figure 2 and Figure 3, but adding our modelled common trend, or, as we prefer to call it, a modelled "polls aggregator" ($Z_{i,t}$) (Figures 4 and 5).

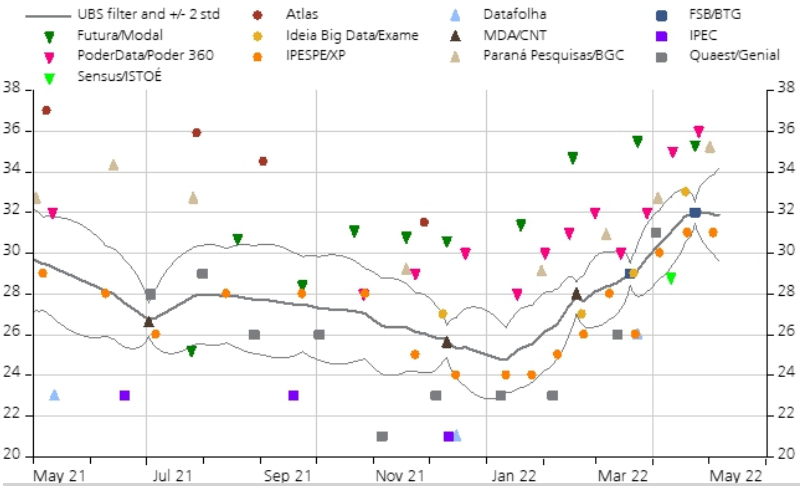
1. More details are available in Koopman, Siem Jan, Neil Shephard, and Jurgen A. Doornik (1999). "Statistical Algorithms for Models in State Space using SsfPack 2.2," Econometrics Journal, 2(1), 107-160.

Figure 4: Lula first-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

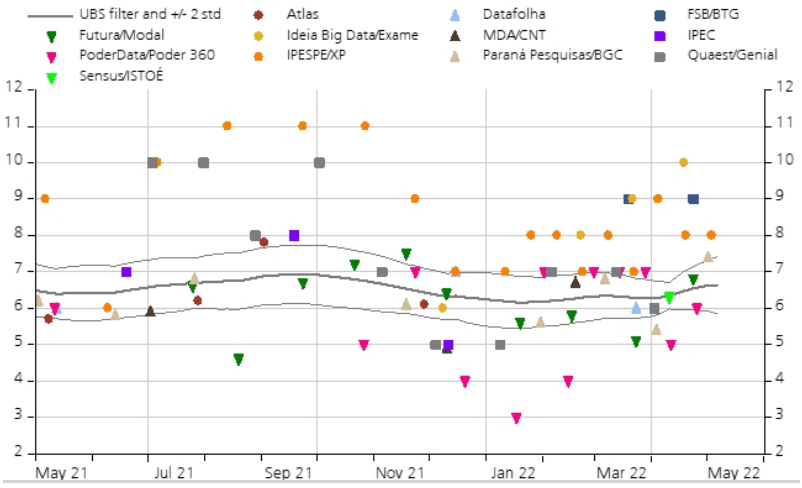
Figure 5: Bolsonaro first-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

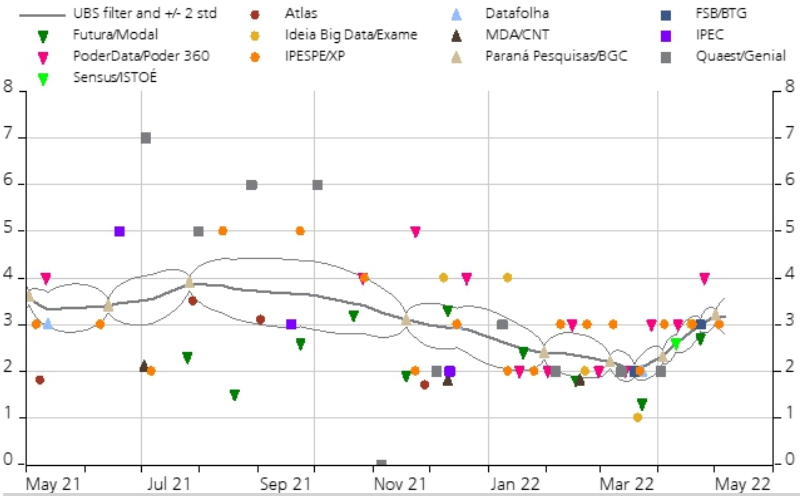
In Figure 6 and Figure 7 we chart the voting intentions for Ciro Gomes and João Doria. Figures 8 and 9 show the same for the "others" candidates together and "don't know, no answer and null voting".

Figure 6: Ciro Gomes first-round voting intentions (%)



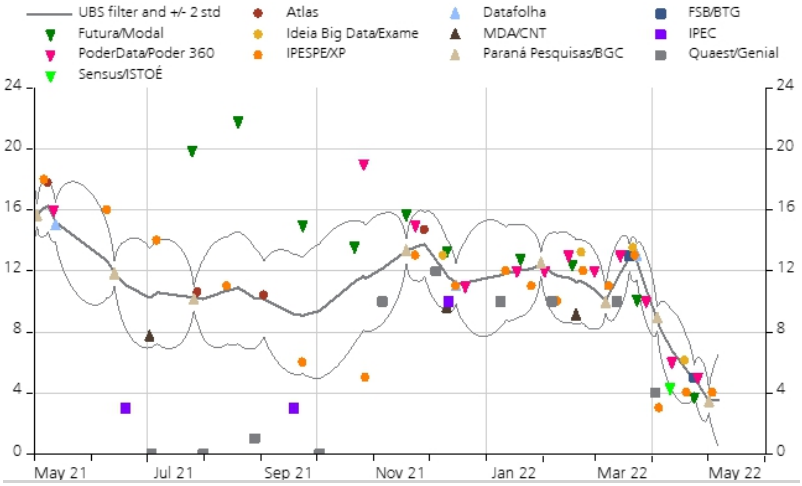
Source: UBS calculations as per aggregating the public polls

Figure 7: João Doria first-round voting intentions (%)



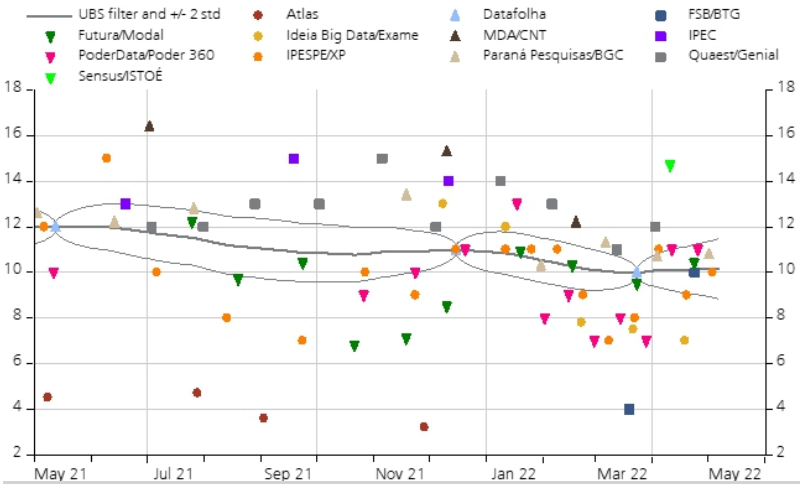
Source: UBS calculations as per aggregating the public polls

Figure 8: "Others" first-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

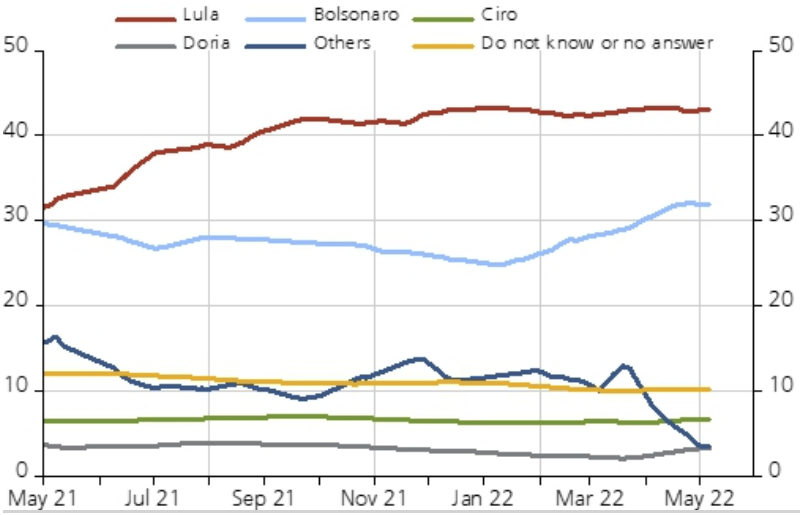
Figure 9: Don't know or no answer first-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

Finally, we show in Figure 10 all the candidates' voting intentions aggregation curves ($Z_{i,t}$) together:

Figure 10: First round voting intentions estimates (%)



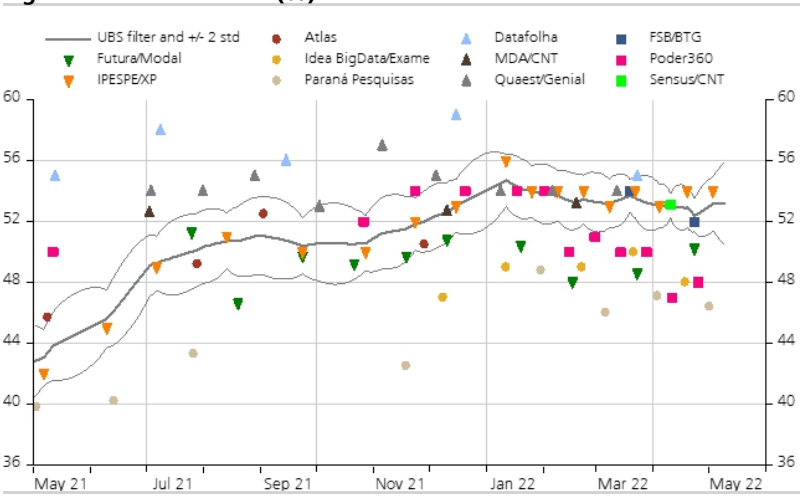
Source: UBS calculations as per aggregating the public polls

It is important to stress that all these computations are not intended to predict the election's outcome, but rather to 'summarize' what we can apprehend from a variety of pollsters. This work does not make any inference about the quality of polls or their correlation to final election results.

The main run-off scenario

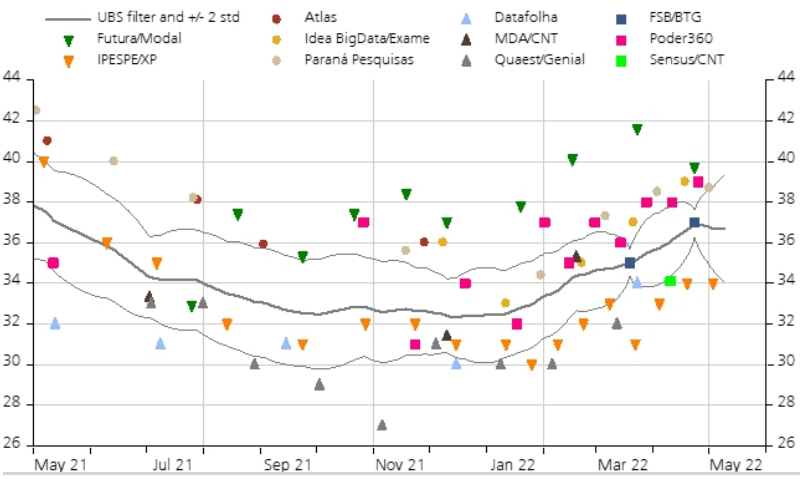
We implemented the same methodology for the most likely run-off scenario according to polls: Lula and Bolsonaro.

Figure 11: Run-off - Lula (%)



Source: UBS calculations as per aggregating the public polls

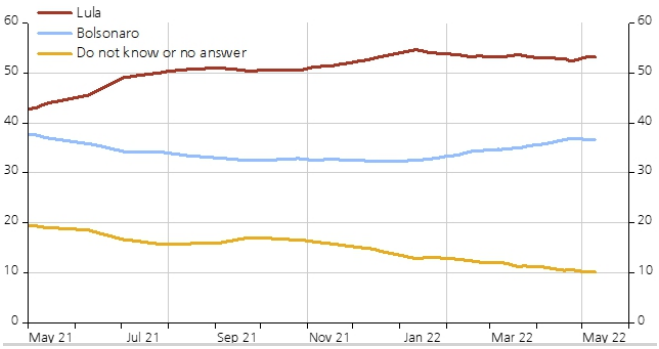
Figure 12: Run-off - Bolsonaro



Source: UBS calculations as per aggregating the public polls

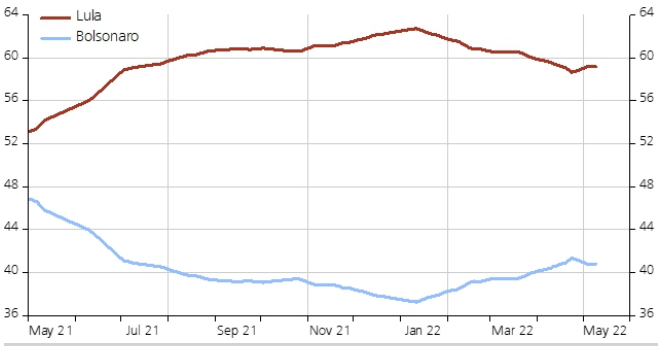
Finally, our aggregator for the run-off ($Z_{i,t}$) in total votes and valid votes (excluding don't know and no answers):

Figure 13: Run-off voting intentions estimates (%)



Source: UBS calculations as per aggregating the public polls

Figure 14: Run-off voting intentions estimates (% of valid votes)



Source: UBS calculations as per aggregating the public polls

Part II: Analysing the results of the election polls aggregator

After modelling the aggregator, the main objective is to "separate the wheat from the chaff." As different polls are available and they sometimes have very different results in terms of levels—although all currently show former President Lula in the lead—a more detailed analysis for the first and second rounds is very important.

First round analysis

Lula

After the Supreme Court decided to annul the judgments in Curitiba regarding former President Lula, he became eligible to run in the election and become a pre-candidate. Since his eligibility became known, there has been a steady increase in his vote intentions in every poll. According to our aggregator, this increased from 32% in May 2021 to 42% in October 2021. Over the same period (May 2021 to October 2021) our aggregator shows a 7ppt drop in vote intentions in the "Others" category, a 1ppt fall in undecided and a 2ppt drop in voting intentions for President Bolsonaro. Since then, vote intentions for former president Lula have been reasonably stable at around 43% (Figure 4).

Bolsonaro

In May 2021 Bolsonaro had a vote intention of 30%, which progressively decreased to 25% in mid-January, but has since regained traction back to 32% (as of early May), according to our aggregator. The initial reduction in support until October 2021 corresponds to Lula's increase in support and, from October to January, to increased vote intentions for other candidates, most notably Former Federal Judge Sergio Moro (who has already resigned as a candidate). The increase after January until Moro gave up his candidacy on 31 March is also likely from "Others" and undecided (which fell 1-2ppt each), helping Bolsonaro reach 30%. The last leg of improvement corresponds to a reduction in voting intentions for "Others" (mostly Moro), over which period President Bolsonaro gained another 2 percentage points (Figure 5).

Ciro Gomes

His vote intentions have been very stable, at 6-7%, with no material change in the analysed period. It is reasonable to infer a very stable and faithful electoral base. We also note a significant volatility difference between polling institutions on his results: the lowest was 3% for one institution and as high as 11% in another. Different samples and methodologies might explain this, but in our aggregator he is very much stable (Figure 6).

João Doria

Stable between 3-4% in the period from May to October 2021. After October he lost momentum until March 2022, reaching 2%, and returned to 3% after Moro gave up his candidacy (Figure 7).

Others

This category was much more significant due to Sergio Moro's presence in the pack, but declined markedly, from around 10-13% before March (when Moro left the race) to 4%. The absence of former judge Moro appears to have increased Bolsonaro vote intentions in our aggregator (Figure 8).

Don't know, no answer or blank/null

This was 12% in the beginning of the period analysed and has been very stable at around 10-11% since November (Figure 9).

Second round analysis

Lula

Vote intentions for the former President in the second round have been similar to those in the first round: an increase from 43% to 51% between May and October 2021, and around 51-55% since November with the last result (as of early May) at 53%. Former President Lula gained and then lost some of the undecided votes (Figure 11).

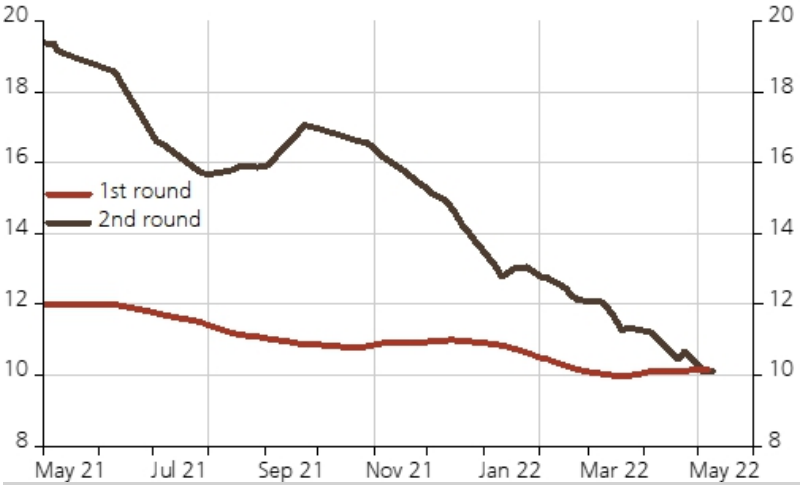
Bolsonaro

For the sitting president there have also been two distinct movements (also analogous to the first round intentions): a steady decrease from May 2021 (at around 38%) to January 2022 (reaching 32%) and a recovery since January, reaching 37% as of May 2022. Undecided votes have fallen from 17% to 13% over the same period (Figure 12).

Don't know, no answer or blank/null

The larger number of undecided voters in comparison to the first round was notable, but the difference was reduced as the likelihood of a second round between Bolsonaro and Lula became more evident (Figure 15).

Figure 15: Don't know or no answer (%)



Source: UBS calculations as per aggregating the public polls

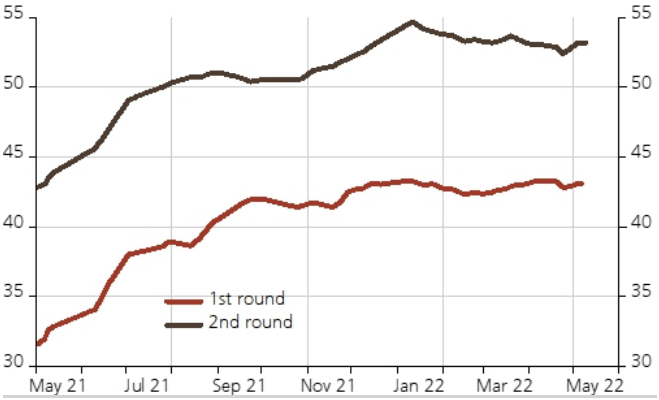
Additional interesting comparisons using the aggregator

Comments on Lula voting intentions

Lula's vote intention in the second round is around 10ppt higher than in the first (Figure 18) and the difference between the first and second rounds is very stable. Some analysts believe this indicates a potential ceiling for Lula's support and that there may be more downside than upside in vote intentions for Lula (see here and here).

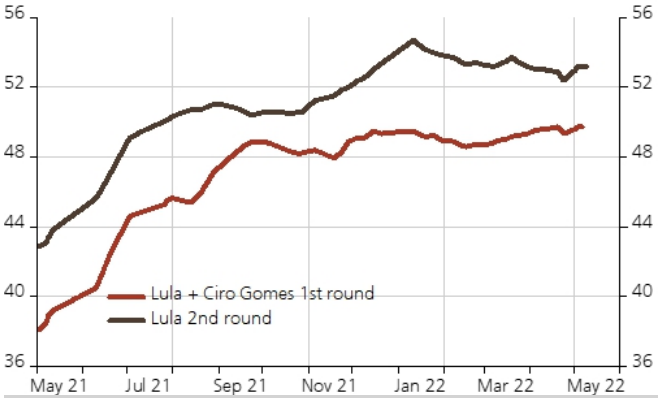
One interesting comparison is adding the vote intentions for Ciro Gomes to Lula's vote intentions in the first round, and comparing this second round vote intention Lula (Figure 17). Since Ciro Gomes is seen as a leftist candidate, some pollsters believe voter intentions for Ciro Gomes could be potential votes for Lula in the second round (see here). The correlation is very straightforward.

Figure 16: Lula first- and second-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

Figure 17: Lula and Ciro Gomes first-round voting intentions vs. Mr. Lula run-off (%)



Source: UBS calculations as per aggregating the public polls

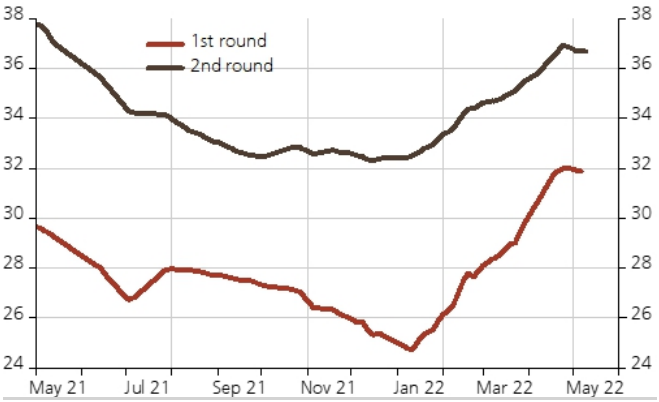
Comments on Bolsonaro voting intentions

The increase in first to second voter intentions for Bolsonaro is lower than that for Lula. In Bolsonaro's case it rises from 32% to 37%, and attribute this to his higher rejection rate[2] than former President Lula.

When adding Doria's (a center-right candidate) first round vote intentions to Bolsonaro's vote intentions, and comparing them to Bolsonaro's second-round vote intentions, the difference is less than 2ppt. As the remaining candidates have only around 3-4% of vote intentions now, we think it is fair to infer that those votes are still undecided.

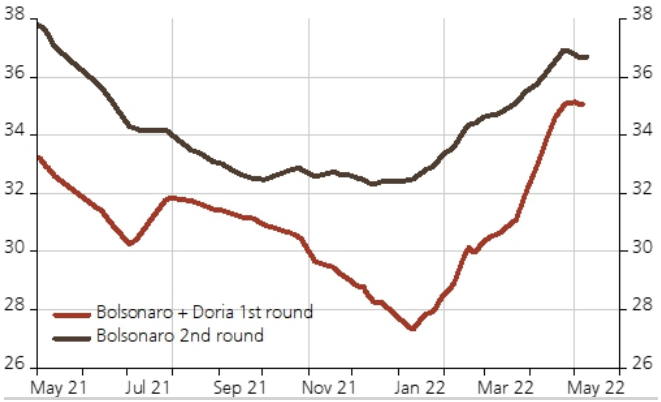
2. Rate of interviewees that declares they would not vote for a candidate under any circumstances.

Figure 18: Bolsonaro first- and second-round voting intentions (%)



Source: UBS calculations as per aggregating the public polls

Figure 19: Bolsonaro and Doria first-round voting intentions vs. Mr. Bolsonaro run-off (%)

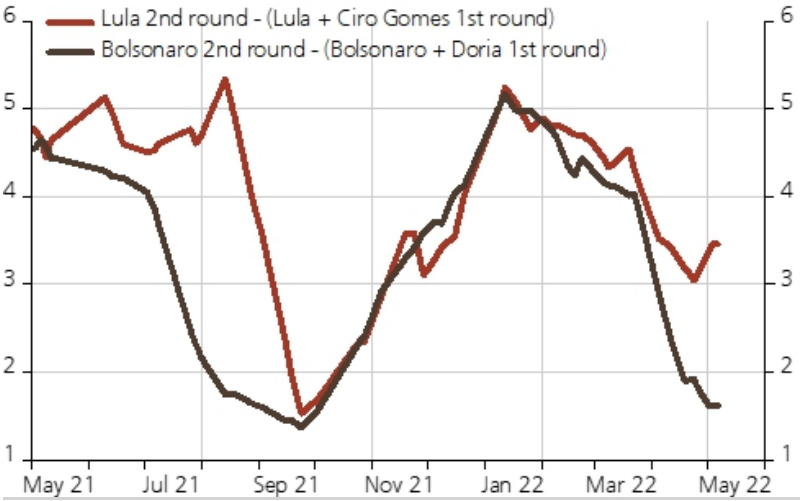


Source: UBS calculations as per aggregating the public polls

Change in electoral results from our aggregator

The difference in vote intentions in the second round from Lula and Lula + Ciro (in the first round) and also from Bolsonaro and Bolsonaro + Doria (in the first round) is not very large (less then 4% in each case, see Figure 20). So the pool of remaining available voters will be from undecided or declared blank/null votes. As of May, Lula has 59% of valid votes and Bolsonaro 41% according to our aggregator.

Figure 20: Difference from voting intentions (ppts)



Source: UBS calculations as per aggregating the public polls

The economic situation in Brazil could have a bearing on vote intentions. Some improvement in inflation and employment might marginally benefit the sitting President. If that is the case, there could be some increase in vote intentions for Bolsonaro in the coming months and some reduction in vote intentions for Lula, although neither seems likely to be very significant.

Stay tuned. We will be updating this aggregator with a higher frequency as more polls become available.

(continues overleaf)

Some final takeaways

1. In past years the number of public opinion polls has increased significantly due to declining costs.
2. They differ in methodology and publication frequency.
3. According to a dozen polls, the main contenders are Lula and Bolsonaro.
4. Our aggregator tries to extract a common component "$Z_{i,t}$" for the main candidates from several polls. It does not represent a forecast for election day, but simply a summary of several different, but correlated polls.
5. Our aggregator shows Lula leading the first round with 43% followed by Bolsonaro with 32%.
6. For the run-off, our computation shows Lula ahead of Bolsonaro by 53% vs. 37%.
7. In valid votes (adjusting for blank, null, no answer and redistributing "don't know") this would be 59% vs. 41%. This is how elections are reported on ballots: only valid votes.

Appendix

Figure 21: The main characteristics of the latest surveys

Institute	Sponsor	Type	# respondents	Error margin (+/- ppts) *	Register code on TSE
PoderData	Poder360	Telephone	3000	2.0	BR-07167/2022
IPESPE	XP Investimentos	Telephone	1000	3.2	BR-03473/2022
IPEC	NA	Face-to-face interview (on streets)	2002	2.0	NA
Ideia Big Data	Exame magazine	Telephone	1500	3.0	BR-02495/2022
Datafolha	Folha de São Paulo newspaper	Face-to-face interview (on streets)	2556	2.0	BR-08967/2022
MDA	CNT	Face-to-face interview (on streets)	2002	2.2	BR-09751/2022
Quaest	Banco Genial	Face-to-face interview (at home)	2000	2.0	BR-00372/2022
Paraná Pesquisas	BGC	Face-to-face interview (on streets)	2020	2.2	BR-09280/2022
Futura	Banco Modal	Telephone	2000	2.2	BR-00758/2022
Atlas Intel	NA	Online (random invites)	4401	1.0	NA
Sensus	ISTOÉ maganize	Face-to-face interview (on streets)	2000	2.2	BR-01631/2022
FSB	BTG Pactual	Telephone	2000	2.0	BR 04676/2022

Source: Atlas, IPEC, TSE. (*) Based on 95% confidence level. Polls conducted before 2022 didn't need to be registered on TSE. See the latest polls for PoderData, IPESPE, IPEC, Ideia Big Data, Datafolha, MDA, Quaest, Paraná Pesquisas, Futura, Atlas, Sensus and FSB in Portuguese.

Valuation Method and Risk Statement

Risks include macroeconomic variables (such as GDP growth rates and inflation), economic slowdown, a weakening currency, global economic events, and government policy changes. Also, in addition to industry and company specific risk, we point out to investors the potential risks inherent in investing in companies with significant assets and business operations in GEM. Potential emerging market related risks include, but are not limited to, the volatile nature of the currency, regulatory and socio-political risk, and abrupt potential changes in the cost of capital and economic growth outlook. Valuations can also be impacted by "contagion" from developments in other emerging markets. Each of these above has the potential to significantly impact company/industry performance.

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