Political risks: the “red shift” in debt sustainability analysis

di Andrea Consiglio and Stavros Zenios[1]

(This is an expanded version of a blog posted at Bruegel on January 22, 2020, https://bruegel.org/2020/01/incorporating-political-risks-into-debt-sustainability-analysis/)

Abstract

Political stability and economic policy uncertainty can be key determinants of sovereign debt dynamics, and we show how they can be incorporated in debt sustainability analysis.

We distinguish between short-term ambiguity and long-term uncertainty about political risk factors, and using a combination of narrative scenarios and calibrated probabilistic scenarios we obtain a comprehensive heatmap of high-risk debt dynamics. We use Italy as an interesting case study and demonstrate a “red shift” in the assessment of vulnerabilities when accounting for political risks. *Ignoring these risks can lead to excessive optimism and wrong decisions.*

La stabilità del sistema politico istituzionale e l'incertezza riguardo le politiche economiche sono due fattori chiave che possono influenzare la dinamica del debito pubblico.

Nell'articolo si propone un modello di analisi della sostenibilità del debito sovrano che tenga conto dei fattori di rischio concernenti l'assetto istituzionale di un paese e le sue politiche economiche.

In particolare, distinguendo fra ambiguità a breve termine e incertezza a lungo termine dei fattori di rischio politico e, utilizzando una combinazione di scenari narrativi e scenari probabilistici, si costruisce una "heatmap" che permette di attribuire ad ogni politica fiscale la probabilità che l'obiettivo di riduzione dello stock di debito o del deficit sia soddisfatto.

Il modello è applicato al caso Italia. I risultati mostrano un "red shift" della vulnerabilità del debito pubblico italiano quando sono inclusi nell'analisi i fattori di rischio politico.

Si può quindi concludere che ignorare i rischi derivanti dall'instabilità del sistema politico-istuzionale, o quelli derivanti dall'incertezza delle politiche economiche, può condurre a un eccessivo ottimismo e a conseguenti scelte sbagliate.

1 Introduction

> “Partly in reaction to the European experience, the traditional approach to debt sustainability assessment has evolved. A fresh view on things is one way to improve the analysis of debt sustainability and develop best practices.”
>
> (Klaus Regling, Managing Director ESM, Debt sustainability conference, Dec. 2018.)

The Greek debt crisis revealed a significant concern regarding the effectiveness of traditional debt sustainability analysis (DSA). Such analysis is used to assess whether a country meets the criteria for receiving international assistance, but around crisis episodes uncertainty is high and focusing on average dynamics, or on a few scenarios, can conceal potential risks.

This is especially acute when official lending moves into addressing problems of economies with large and active bond markets with adverse feedback loops. And whereas DSA applies to crisis countries, an early warning system identifying vulnerabilities is relevant for all countries. We suggest that a more general, less stringent, debt vulnerabilities analysis (DVA) could be used to assess a country’s debt management policies to identify vulnerabilities, without leading immediately to policy consequence. DVA would not carry the significant connotations of DSA. For instance, the Dutch State Treasury Agency evaluates its public debt management practices every three years, even as its debt-to-GDP ratio is only 50%. The Agency carries out a comprehensive analysis prior to a political review, including an evaluation of vulnerabilities, and the policy implications are transmitted by the Dutch Minister of Finance to the Parliament.[2] DVA would have less stringent criteria for raising a red flag,

---

[1] A. Consiglio is with University of Palermo, Palermo, Italy. S.A. Zenios is with University of Cyprus and Non-Resident Fellow of Bruegel. We acknowledge useful comments from Marialena Athanasopoulou, Maria Demertzis, Rebecca Christie, and Guntram Wolff. We thank Giovanni Pagliardi for comments and for permission to use data from a draft paper on the sensitivity of bond yields to political risk factors.

[2] The evaluation for the 2019 political review was carried out by SEO Amsterdam Economics, and their report is available as J. Hers, R. Beetsma, J. Witteman, and N. Verheuvel. *Independent assessment of the 2016–2019 interest rate risk framework and funding policy*, Report commissioned by Dutch State Treasury Agency, SEO Amsterdam Economics, Amsterdam, February 2019. The full report (in English) and the letter of the Finance Minister (in Dutch) to the Parliament are available at https://www.dsta.nl/actueel/persberichten/2019/11/22/nieuw-beleidskader-financiering-staatsschuld . For DVA they use the model of Zenios et al. (2019), see pp. 19, 24-30 in the SEO report.

such as when a country may pass the DSA test but its debt is non-decreasing from very high levels. Also, DVA should cover a broad set of risk factors to identify problems before they become critical. Italy presents a good example where high debt levels leave the country vulnerable to market reactions, with a real risk of entering unsustainable territory if remedial actions are not taken.

DSA tools have been evolving to assess risks beyond mean value projections. The IMF adopts a "fan-chart approach" to debt sustainability (IMF, 2013), the ECB embeds debt simulations under a benchmark and several narrative scenarios (Bouabdalah et al., 2017), and ESM optimizes the sovereign's tail risk to assess, with high probability, whether non-sustainable debt dynamics are imminent or a future possibility (Zenios et al. 2019).

In these approaches, uncertainty (i.e., the probability distribution of key risk factors) takes centre stage. IMF advocates the use of a baseline scenario with alternative narrative scenarios, and for "higher scrutiny countries" it supplements its analysis with fan charts. The ECB framework also provides for a stochastic analysis using a probabilistic approach with heat maps, in addition to narrative shock scenarios. ESM uses calibrated multi-period scenario trees to derive fan charts of both debt stock and flow dynamics, and optimizes the bond issuance to limit extreme (tail) adverse events.

2 Which risk factors?

The main risk factors are common to all three institutions: They include the fiscal consolidation path, GDP growth, and financial assumptions relating to the sovereign bond yields. Narrative scenarios can include ageing costs, macro (bank) stress tests, inflation shocks, structural shocks, contingent liabilities, and privatization receipts. *We argue that political risk factors can also be quantified, and should be part of debt analysis.*

Political risks guide expert judgment by the institutions, but they are not part of DSA models and are treated without the quantitative rigour reserved for macroeconomic, financial, and fiscal risks. IMF makes references to political risks and policy uncertainty in its Article IV Consultation reports.[3] Such references appear twenty-six times in the 2016 Article IV report for Greece, twelve times in the 2018 report, and four times in 2019. The ESM uses governance and/or political risk ratings —from the World Bank, the Corruption Perception Index of Transparency International, the aggregate political risk index of the PRS group— in its Sovereign Vulnerabilities Index and, likewise, ECB uses such ratings to generate a heat map, classifying RED countries in the bottom ratings tercile, GREEN in the top tercile, and YELLOW in the middle. Such broad treatment of political risks is useful, but unlikely to be effective.

The omission of political risks from DSA models for distressed countries is surprising, since political risks are clearly perceived as important. The lack of quantitative rigour is, in our opinion, due to inadequate quantifiable empirical evidence and an appropriate framework, but in recent years both have become available, allowing us for a fresh view on the problem. Inadequate treatment of these risks can lead to excessive optimism and wrong decisions, as we will demonstrate for the case of Italy.

The systematic quantification of political risks has been receiving increasing attention. The economic effects of politics have been studied as early as Schattschneider (1935), and the market effects of political uncertainty goes back to the study of Imperial Germany and the Weimar Republic (Bittlingmayer, 1988). Recent, renewed, interest is driven in part by the compilation of databases that facilitate cross-sectional studies. Such databases include the Ifo World Economic Survey-WES[4] (25 years of semi-annual data for 66 countries), the World Bank (25 years of annual data for 214 countries), the ICRG index (40 years of annual data for up to 140 countries), and the Economic Policy Uncertainty index[5] posted on the Dallas Fed (25 years of monthly data for 21 countries). Impetus was also given by theoretical models and empirical evidence that the markets price political risks.[6]

We show how political risks can be incorporated in DSA (and DVA) and materially affect the conclusions. First, we identify two key quantifiable dimensions of political risk. Second, we make a distinction between short-term ambiguity about the political factors that cannot be measured, and long-term risks that are modeled probabilistically. Third, we show how a combination of narrative scenarios about the short-term ambiguity, and calibrated probabilistic scenarios for long-term risks, gives a comprehensive heatmap of *high-risk debt dynamics*.

---

[3] See, for instance, the 2018 Financial Stability Report and the 2018 Global Outlook Reports

[4] Becker, S. O. and K. Wohlrabe. "Micro data at the Ifo Institute for Economic Research: The Ifo Business Survey, usage and access," Working Paper 47, Ifo Institute for Economic Research, Munich, 2007.

[5] Baker, S. R., N. Bloom, and S. J. Davis (2016). Measuring economic policy uncertainty, *The Quarterly J. of Economics*, 131:1593–1636.

[6] See Pastor, L. and P. Veronesi (2012). Uncertainty about government policy and stock prices, *The Journal of Finance*, 67:1219–1264, and Bekaert, G., C. R. Harvey, C. T. Lundblad, and S. Siegel (2014): Political risk spreads, *Journal of International Business Studies*, 45:471–493.

3 Political Stability and Confidence in Economic Policy

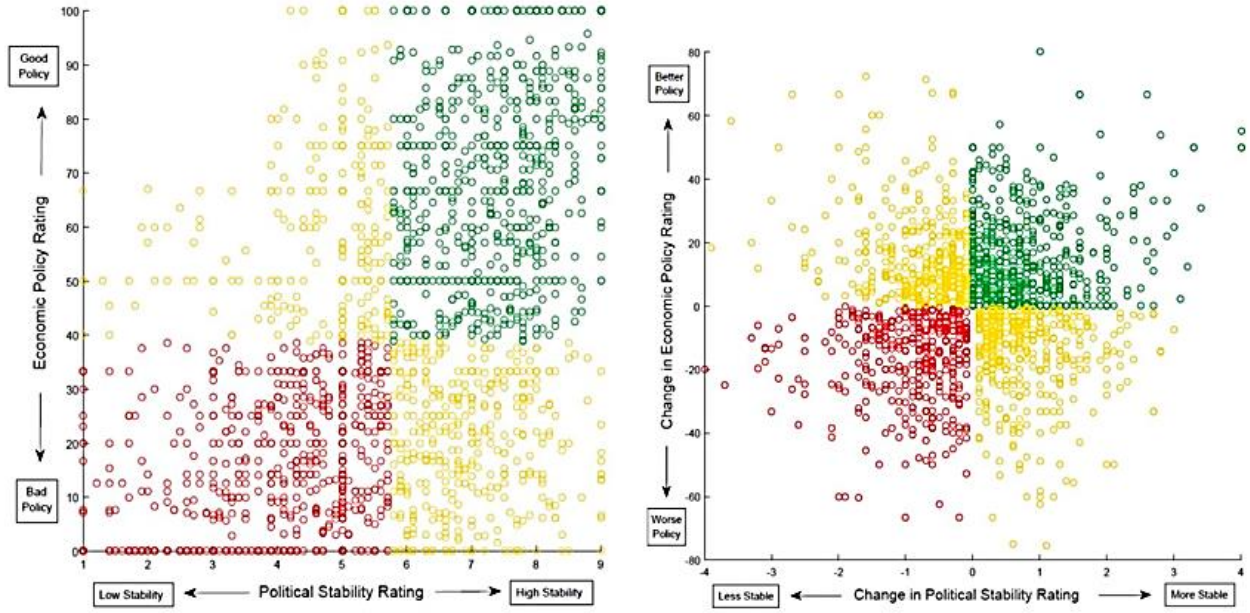
The work of Douglass C. North (1991) on institutions as "the rules of the game in a society or, more formally, the humanly devised constraints that shape human interaction" classifies rules into "political rules, economic rules, and contracts".[7] Contracts are firm specific, potentially giving rise to idiosyncratic risk, but political and economic policy rules create systematic risks that should be priced in financial markets. North argues for separating the analysis of rules from economic policy choices.

Recently, Gala, Pagliardi, and Zenios (2018) studied the differential effects of politics and policy variables, using two variables from the Ifo World Economic Survey:

i. The importance of political stability on the climate for foreign investors
ii. The importance of confidence in the government's economic policy for the economy

A plot of these data for a sample of 42 countries over the period Jan. 1992 to Dec. 2016, reveals that politics and policy are not in tandem, see Figure 1. Countries with highly rated policies and low rated politics, and vice versa, are not just a few isolated cases, but instead, we observe them often, and for good reasons.

For instance, a country may be on a specific policy path no matter which party wins the elections, as was the case of the Greek fiscal adjustment program, implemented under a liberal government, a coalition of liberals with the socialists, and the radical left. Alternatively, a stable political system may face uncertainty in the economic policy agenda of a coalition government, as was the case after the 2018 German elections.



(Source: Gala, Pagliardi, and Zenios (2018) using the WES country ratings. Political stability is scaled from 1 to 9, and economic policy from 0 to 100, with higher scores denoting more stability and higher confidence.)

Figure 1. Ratings of political stability and economic policy for 42 economies during 1992-2016.

Political stability and confidence in economic policy have material differential effects on the financial markets. Gala, Pagliardi, and Zenios find that politics and policy have economically large and statistically significant impacts on returns, with their risk premia being almost additive. They document that international equity investment strategies that exploit the politics-policy predictability generate abnormal returns up to 14% p.a. Significant political premia are also observed for bond yields, exchange rates, and CDS spreads.[8]

Countries in the top and bottom terciles of political stability and confidence in economic policy, differ by 2.84% in their annual sovereign bond yields, 205bp in CDS spreads, and 13% in annual currency depreciations. Similarly, a country that improves its political stability ranking by 1 unit sees a reduction of its refinancing rates by 0.7%, with a reduction of 0.2% after a

[7] North was a co-recipient of the 1993 Nobel Memorial Prize in Economic Sciences for "applying economic theory and quantitative methods in order to explain economic and institutional change".

[8] Based on ongoing work of one of us with Giovanni Pagliardi (BI, the Norwegian Business School) from a draft paper on "Political risks everywhere".

comparable improvement in economic policy confidence.[9] If Greece, for instance, would see its political stability downrated by 4 units on the WES scale, with its economic policy confidence remaining at zero (as it happened after the second bailout in 2012), its borrowing costs would deteriorate by 2.8%. *These changes in refinancing costs are attributed to the political risk factors, since the estimation regressions control for growth, unemployment, and debt. This allows us to* incorporate political effects in a DSA model.

We will use the model of Zenios et al. (2019) to optimize the sovereign debt issuance and ensure non-increasing debt dynamics (or reasonably fast-decreasing dynamics, for high debt countries). The model incorporates the critical dynamics of debt stock and debt flow (i.e., gross financing needs) into an optimizing problem, to minimize tail risk under macroeconomic, fiscal, and financial uncertainty, accounting for the feedback between debt stock and refinancing rates. Tails are the extreme quantiles (typically at the 0.95 level) of the stock and flow dynamics, and for sustainability they must remain within some thresholds. Uncertainty is represented using *scenario trees*, building on a long tradition of multi-period stochastic models that find numerous applications in the risk management of financial institutions.[10]

4 Short-term political ambiguity and long-term uncertainty

To incorporate political risks in DSA we are faced with the problem of uncertainty specification, which has been daunting economists for a very long time. Arrow (1951) distinguished *risk within a model*, where uncertainty is about outcomes that can be fully specified by a probabilistic model, and *ambiguity among models*, where we are uncertain about which model to use to assign probabilities. Knight (1921) had studies ambiguity three decades earlier, calling "risk" those situations where uncertainty could be described with a probabilistic model, and "true uncertainty" situations with partial ignorance about potential outcomes and their likelihood. To account for political risks in DSA we need to account for short-term ambiguity (i.e., which government wins the election, what policies will they institute, will a country be able to follow an adjustment program?), and the long-term volatility towards a well estimated expected future state, if we think that such an equilibrium state exists. In general, it is not possible to estimate reliably an election outcome or what policy a new government will follow. And even if this were the case, we are not faced with a repeated game, to work with expectations (or quantiles) over many repetitions.

How to incorporate both ambiguity about events in the short run and uncertainty about long-term trends? We adopt narrative scenarios for variables with ambiguous immediate outcomes, to see what the bad outcomes may be, and *calibrate probabilistic scenarios for long-run uncertainty to estimate appropriate risk metrics. Under ambiguity we run the DSA model for a range of plausible values for the critical variables that are affected by political event. For the long-run risks we calibrate scenarios of economic, fiscal, and financial variables, accounting for political effects. With this approach we identify values of ambiguous variables with high probability of bad outcomes, so that they can be avoided. The result is a comprehensive heatmap of high-risk debt dynamics, with quantile optimization for those aspects of the problem that are amenable to scenario calibration, and identification of narrative scenarios with bad outcomes that must be avoided, for the ambiguous aspects.*

5 Political risks and the "red shift" in debt sustainability analysis

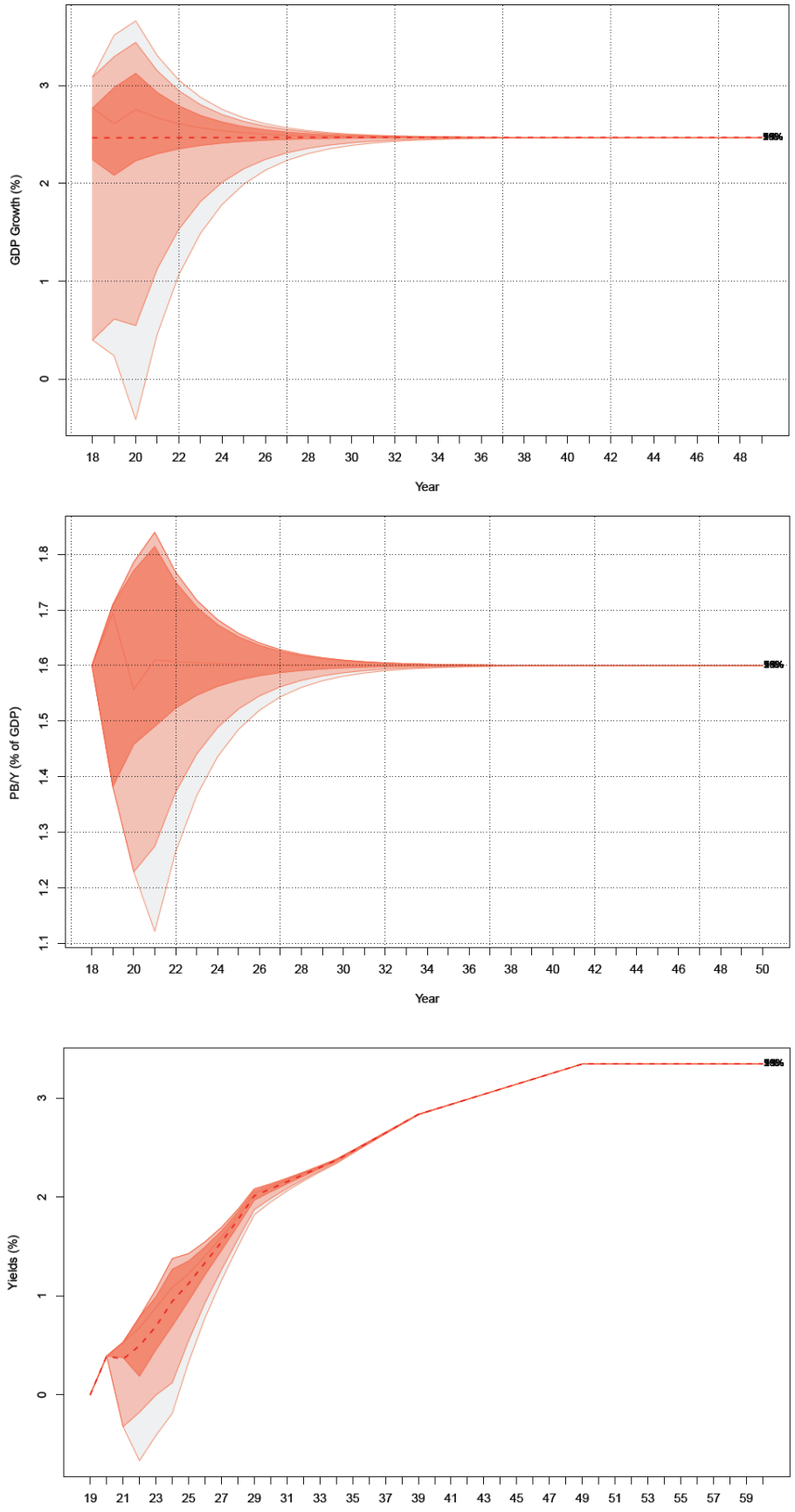
Italy provides an interesting case study for a proof-of-concept. We extend our DSA model to evaluate the 2019 budget agreement between the Italian government and the EC. We assess if Italy can stay on a non-increasing debt path with gross financing needs below an IMF-specified threshold of 20% of GDP, and demonstrate the material effects of political risks. (Our assessment criteria are less stringent than those of official DSA.)

We start with a scenario tree of GDP growth, primary balance, and the risk-free rate of eurozone 5-year AAA rated sovereigns, but without political variables. The tree is calibrated to Italy's conditions and observed market data, using historical volatilities and correlations. Fan chart samples from the tree are illustrated in Figure . To the scenarios of risk-free rates the model adds premia capturing the response of borrowing rates to debt levels.[11]

[9] These estimates were obtained running Fama-MacBeth cross-section regressions on the panel data in our sample of the yields of 10-year government bonds on the ratings of political stability and economic policy confidence.

[10] See, for instance, Mulvey, J. and W.T. Ziemba (eds.), Worldwide Asset and Liability Modelling, Cambridge, UK: Cambridge University Press, 1991, and S.A. Zenios. Practical Financial Optimization. Decision making for financial engineers. Malden, MA: Blackwell-Wiley Finance, 2007.

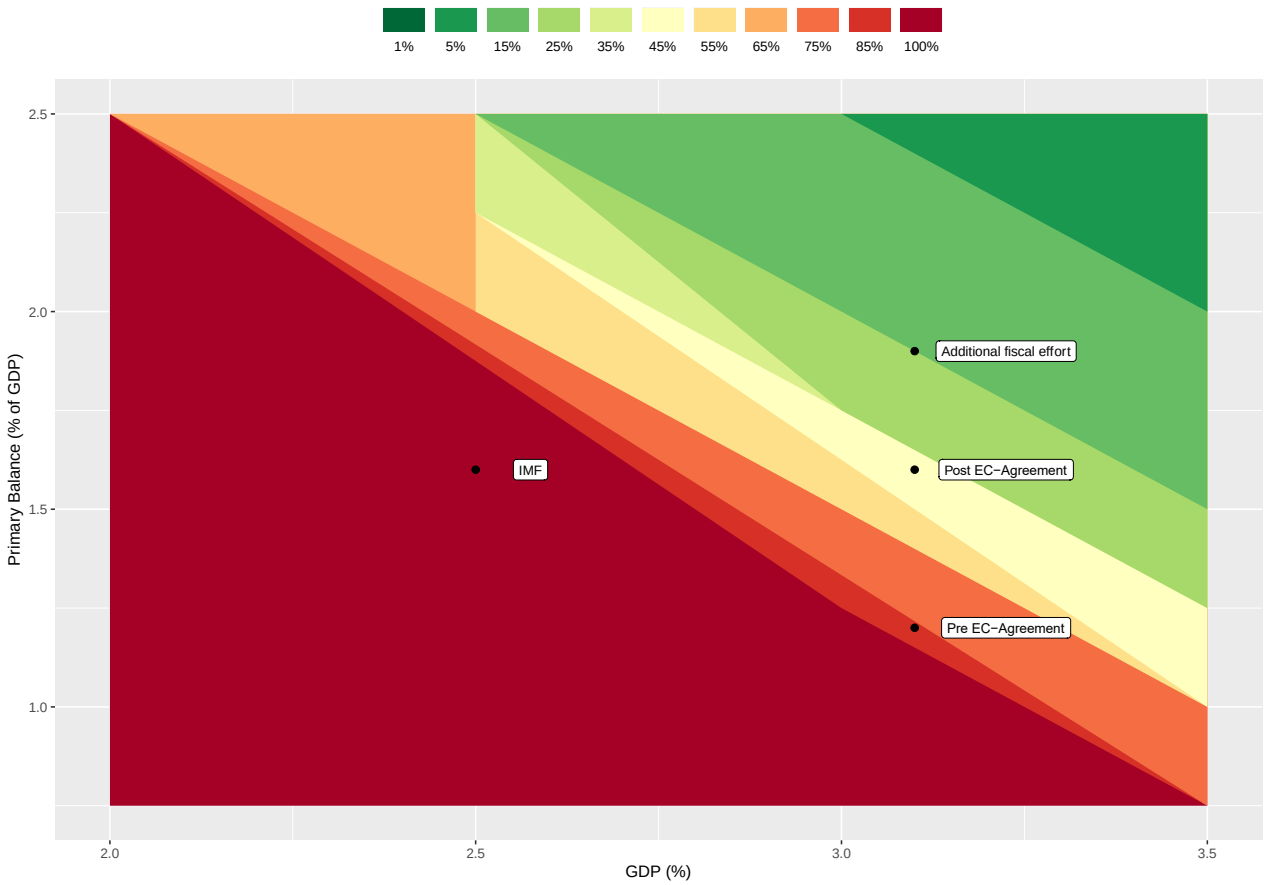
[11] The endogenous response of interest rates to debt levels and calibration to eurozone data, are in section 4.2 of Zenios et al. (2019).



(Source: Calibration from Zenios et al. 2019, Figure C.1.)

Figure 2 Scenarios for (a) macroeconomic, (b) fiscal, (c) financial variables for Italy.

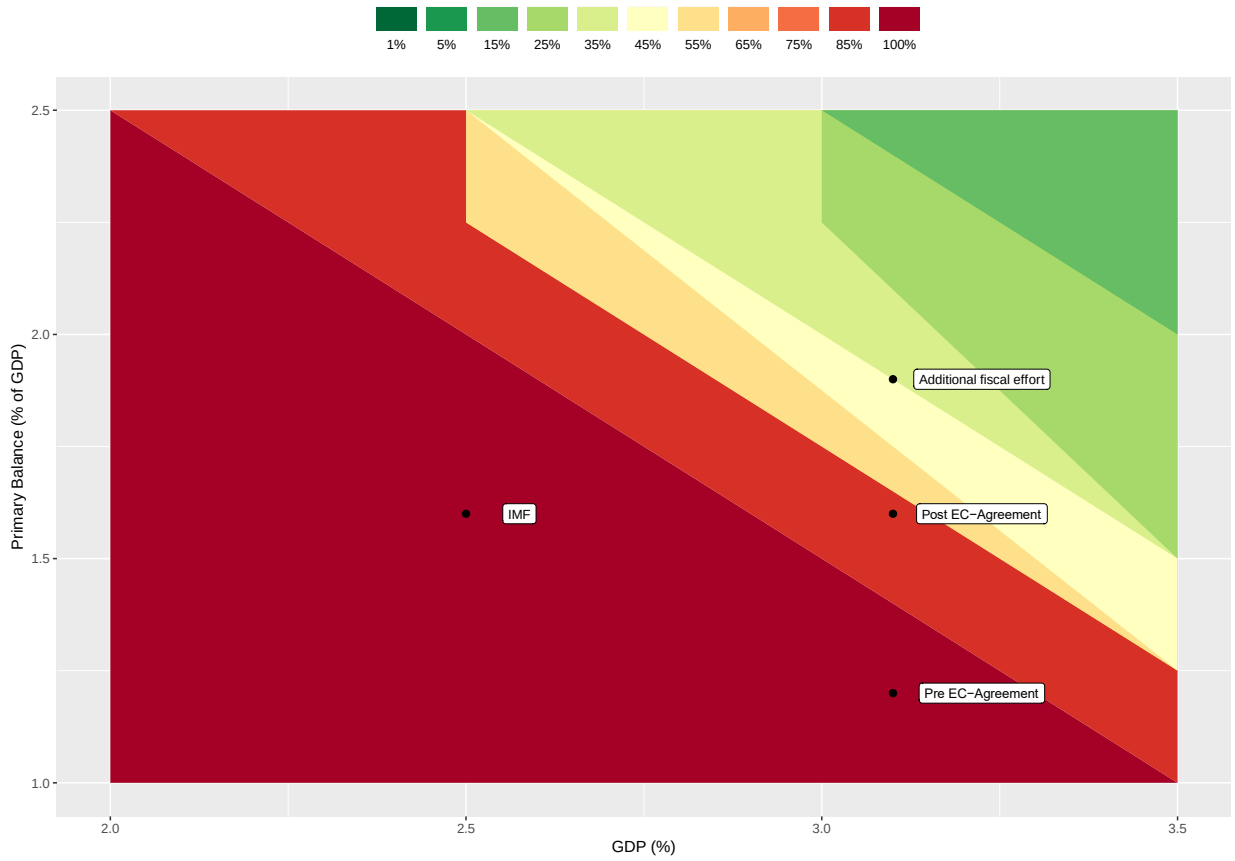
A significant short term political risk for DSA is the fiscal stance of the new government following the 2018 elections. We parametrically change growth and primary balance projections to cover plausible outcomes, and evaluate, using the calibrated long-term trees, the probability that debt stock and gross financing needs will stay within the thresholds. The result is a heatmap that shows the likelihood of debt dynamics remaining within the thresholds for a wide range of the ambiguous variables. We use the model to draw the heatmap and assess the Italian debt dynamics under three narrative scenarios: (i) no policy change, (ii) the new Italian government achieves its growth and surplus projections, and (iii) Italy reaches the targets of the negotiated EC agreement. For each narrative scenario we will assess if its outcomes violate the thresholds, and, therefore, must be avoided. Figure 3 shows the heat map, with dark GREEN denoting extremely low probability (0.01) of unsustainable dynamics, and RED denoting very high probability (0.85). Note that for a wide range of combinations of GDP growth and primary balance the dynamics are unsustainable with very high probability. The country is clearly vulnerable, a point which was also emphasized in Sapir (2018) and for which there exists currently a broad consensus. On this map we place our narrative scenarios: ``IMF'' denotes projections from the IMF World Economic Outlook report for 2018, and under our model calibration and without any change in policy the debt dynamics are unsustainable with very high probability. ``Pre EC-agreement'' corresponds to the Italian government targets, and improves upon the current policy but it is still in the RED zone. ``Post EC-Agreement'' presents further improvements, shifting the country to the YELLOW zone, with probability 0.55 for sustainable dynamics. The sagacity of a policy with 0.55 chance of achieving its objectives is questionable, and additional fiscal effort is needed to increase the probability of remaining within the thresholds to 0.85 (GREEN). Using the model we estimate that a total fiscal effort of 3.5% of GDP over twelve years, capped at 0.3% p.a., Italy can reach this target. This finding is in agreement with Sapir (2018) that Italy should have been running consistently higher primary surplus to avoid finding itself in its current predicament, although our estimates for the extra effort are lower.



(Source: Authors calculations using the model of Zenios et al. (2019). Color-coded are the probabilities of increasing debt stock or gross financing needs violating the threshold over the risk horizon, for different combinations of primary balance and long-term growth. Also shown are results with the 2018 IMF projections for the Italian economy, the projections of the Italian government (Pre EC-agreement), and the projections agreed with the EC (Post EC-agreement). With additional fiscal effort of about 3.5% of GDP over the next twelve years the country enters the GREEN zone).

Figure 3. Probability of the Italian debt violating thresholds on debt stock or gross financing needs.

We now incorporate long-term political risks. *We generate a new scenario tree with political stability and economic policy confidence state variables, calibrated to the country's volatile political variables around estimated long-term trends*. To calibrate the political state variables we assume that they converge long-term to their historical averages of 4.5 for stability and 15.5 for policy. We also estimate volatilities from the historical ratings for Italy, namely a standard deviation of 1 for stability and 11 for economic policy confidence. The political variables are correlated with growth, primary balance, and interest rates, with historical correlations from -0.44 to 0.75, respectively. We now have a calibrated tree that accounts for political risk factors, with fan charts of the political variables qualitatively similar to those in *Figure 2*. Regression estimates of the bond yield sensitivities to these factors are then added to the scenarios of refinancing costs, adjusted with the endogenous debt risk premium. We re-run the model including political risk premia and redraw the heatmap in *Figure 4*.



(Source: Authors calculations as in the caption of Figure)

Figure 4. Probability of the Italian debt violating thresholds on stock or gross financing needs under political risks.

Comparing with *Figure 3* we note a marked "red shift" of the area with high probability of unsustainable dynamics. More combinations of growth and primary surplus have high probability of violating the thresholds. Under our model, the agreement with the EC, which was estimated to have a slightly better than 0.50 chance of success, fails with probability 0.85 when accounting for political risks. The additional fiscal effort that restores sustainability with probability 0.85, is now borderline light GREEN with 0.65 to 0.55 chance of success. Clearly, ignoring the political risks can lead to excessive optimism and wrong decisions.

6 Conclusions

Political risks can have material effects on sovereign borrowing costs. However, current debt sustainability analyses by the major international institutions ---IMF, ECB, and ESM--- treat non-quantitatively this significant risk factor. We argue that more rigor is both possible and essential, to incorporate political risks in DSA. We have also argued that DSA should go beyond testing unsustainable dynamics for distressed countries, to Debt Vulnerabilities Analysis for any country.

We show how a model can be extended to account for political risks. The short-term political risks cannot be treated probabilistically and we resort to narrative scenarios. Long-term political risks can be calibrated probabilistically, and we use recent advances in estimating political stability and economic policy confidence premia for the calibration. We combine the narrative scenarios with the calibrated probabilistic scenarios to generate a comprehensive heatmap, and demonstrate using Italy

as a case study. We assess the 2019 budget agreement between the Italian government and the EC, and document a significant "red shift" in the vulnerabilities of Italy when accounting for political risks.

Andrea Consiglio and Stavros Zenios

References

Arrow, K. J. Alternative approaches to the theory of choice in risk-taking situations. Econometrica, 19:404–437, 1951.

Ben-Haim , Y. and M. Demertzis , Decision Making in Times of Knightian Uncertainty: An Info-Gap Perspective, Economics, 10:2016-2023, 2016.

Bittlingmayer, G. Output, stock volatility, and political uncertainty in a natural experiment: Germany, 1880-1940, The Journal of Finance, 53:2243-2257, 1998.

Bouabdalah, O., Checherita-Westphal, C., Warmedinger, T., de Stefani, R., Drudi, F., Setzer, R., and Westphal, A. Debt sustainability analysis for euro area sovereigns: a methodological framework, European Central Bank, Occasional Paper Series No. 185, 2017.

Gala, V., G. Pagliardi, and S.A. Zenios, International politics and policy risk factors, Working Paper, 2018. (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3242300)

IMF, Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries, International Monetary Fund, Washington, D.C., 2013.

Knight, F. H., Risk, Uncertainty, and Profit. Boston, MA: Hart, Schaffner & Marx; Houghton Mifflin Company, 1921.

North, D. C., Institutions, Institutional Change, and Economic Performance, Cambridge, UK: Cambridge University Press, 1998.

Sapir, A. High public debt in euro-area countries: comparing Belgium and Italy. Policy Contribution No. 15, September 2018.

Schattschneider, E. Politics, Pressures and the Tariff, New York, NY: Prentice-Hall, 1935.

Zenios, S.A., A. Consiglio, M. Athanasopoulou, E. Moshammer, A. Gavilan, and A. Erce. Risk management for sovereign financing with sustainability conditions. Globalization Institute Working Paper 367, Federal Reserve Bank of Dallas, 2019. (https://www.dallasfed.org/~/media/documents/institute/wpapers/2019/0367.pdf)

RISK MANAGEMENT MAGAZINE

Anno 15, numero 1 **Gennaio – Aprile 2020**

Poste Italiane - Spedizione in abbonamento postale – 70% aut. DCB / Genova nr. 569 anno 2005

TESTATA INDIPENDENTE CHE NON PERCEPISCE CONTRIBUTI PUBBLICI (legge 250/1990)

In collaborazione con REFINITIV

IN QUESTO NUMERO

Risk Management Magazine
Anno 15 n° 1 Gennaio - Aprile 2020

Direttore Responsabile:
Maurizio Vallino

Condirettore
Corrado Meglio

Proprietà, Redazione e Segreteria:
Associazione Italiana Financial Industry Risk Managers (AIFIRM), Via Sile 18, 20139 Milano

Registrazione del Tribunale di Milano n° 629 del 10/9/2004

ISSN 2612-3665

E-mail: risk.management.magazine@aifirm.it; Tel. 389 6946315

Stampa: Algraphy S.n.c. - Passo Ponte Carrega 62-62r 16141 Genova

SPEDIZIONE IN ABBONAMENTO POSTALE AI SOCI AIFIRM RESIDENTI IN ITALIA, IN REGOLA CON L'ISCRIZIONE

Rivista in stampa: 8 Aprile 2020

Rivista accreditata AIDEA