

## RESEARCH STATEMENT

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My research focuses on the broad question of how the inability of governments, households, and firms to commit to future policies and actions shapes macroeconomic outcomes in modern societies. My research can be grouped into three broad areas: i) government debt, default, and interest rate dynamics, ii) credibility and reputation in government policies, in particular optimal fiscal rules and optimal currency areas, and iii) the role of financial market imperfections for aggregate outcomes. In the rest of this document, I detail my contributions to these three areas. For copies of specific papers, please visit <https://www.alessandrodovis.com/research.html>.

### 1 Government debt, default, and interest rate dynamics

Government debt crises and defaults are recurrent features in emerging market economies and, as illustrated by the European debt crisis in 2008-2012, they also occur in advanced economies. These episodes are typically accompanied by severe economic downturn with large drop in GDP, disruption in trade flows, and reduction in public spending and transfers. My research aims at understanding these phenomena.

I investigate three main themes. First, I study the role played by lenders coordination failures and bailout expectations in accounting for debt crises. For example, in my work with Luigi Bocola, we propose a strategy to disentangle and quantify the contribution of lenders' coordination failure for interest rate and apply it to the experience of Italy during 2008-2012. Second, I study the role of the composition of debt holdings for the sustainability of government debt. The main contribution to this area is to show that a benevolent government without commitment may find it optimal to force domestic financial intermediaries to hold government bonds to increase the credibility of government's repayments. Third, I study debt crises through the lens of the optimal risk sharing arrangement between lenders and a government that lacks commitment and has private information. This novel approach provides a different interpretation for the behavior of the maturity composition of debt, seniority clauses, and the desirability of bailouts than the standard approach.

**Lenders coordination failures and bailout expectations** The canonical framework to study sovereign defaults builds on the seminal contribution of [Eaton and Gersovitz \(1981\)](#).

Models in this strand of the literature consider an optimizing government that cannot commit to repay its debt and can issue a limited set of financial assets (*incomplete markets*). In particular, the amount that the government promises to repay cannot be contingent on the state of the economy. The only way for the government to change its repayment is by defaulting on the debt.

In this class of models, fluctuations in the interest rate required by credit markets to hold the government debt are driven by movements in fundamentals, such as GDP or the level of inherited debt. However, many of these models admit multiple equilibria and interest rates are not uniquely determined by fundamentals. As shown by [Cole and Kehoe \(2000\)](#), lenders' pessimistic beliefs about the solvency of a government can become self-fulfilling and trigger a default.

In [Bocola and Dovis \(2019\)](#), we investigate whether fluctuations in these beliefs can account for a large part of the fluctuations in sovereign bond yields. This, for example, has been a common justification for the sudden increase in interest rate spreads of southern European economies in 2011, and for their subsequent decline upon the introduction of the Outright Monetary Transactions (OMT) bond-purchasing program by the European Central Bank. According to this view, these interventions were desirable because they reduced interest rate spreads that were higher than what was justified solely by economic fundamentals.

An alternative view is that the observed increase of interest rate spreads was solely due to a worsening of economic fundamentals in southern European economies in the aftermath of the Great Recession in 2008-2012; and the decline in spreads following the institution of the OMT program reflected heightened expectations of future bailouts. ([Dovis and Kirpalani \(2022\)](#) propose a model for this channel.) This alternative view may lead to a less favorable interpretation of the policies implemented in Europe. Thus, evaluating the source of interest rate spreads is important to assess the desirability of policy interventions like OMT.

We construct a model that allows for both mechanisms. Spreads can be high because of bad fundamentals (*fundamental spreads*) or because of pessimistic lenders' expectations (*non-fundamental spreads*). We then use the model to measure the fundamental and non-fundamental component of interest rate spreads during the Eurozone crisis.

The key insight of the paper is that the maturity composition of debt optimally chosen by the government responds differently to these two sources of default risk, and it thus provides information on their relative importance. That is, we show that if the increase in interest rates is driven by fundamentals, the government finds it optimal to issue more short-term debt. If instead the spreads are driven by pessimistic expectations, the government has an incentive to issue more long-term debt. Thus, we can indirectly infer the importance of the two spreads component from the behavior of the maturity composition

of debt.

After fitting the model to Italian data, we find that less than 15% of the interest rate spreads in 2008–2012 were due, on average, to non-fundamental risk. We then use this decomposition to assess the implications of the OMT program. We find that OMT affected spreads over and beyond the elimination of the non-fundamental component, lending support to the view that the policy fostered expectations of future bailouts.

Expectations about the generosity of bailouts are an important driver for interest rates on defaultable debt issued by local governments (such as a member of the Eurozone) and financial institutions. For example, in addition to the case of OMT just discussed, in the recent US financial crisis, spreads of large financial institutions rose sharply after regulators let Lehman Brothers fail, a negative news event about the willingness of the government to bail out financial firms. But reversed course after the announcement of the Troubled Asset Relief Program (TARP), a positive news event, even though fundamentals arguably worsened.

In [Dovis and Kirpalani \(2022\)](#), we propose a joint theory for interest rate dynamics and bailout decisions. Interest rate spreads are driven by time-varying fundamentals and expectations of future bailouts from a common central government. Private agents have beliefs about whether the central government is a commitment type, which never bails out, or an optimizing type, which sequentially decides whether to bail out or not, and learn by observing its actions. We jointly characterize the dynamics of spreads and the optimal bailout decision and show that this model can generate spreads which are non-monotonic in fundamentals and the contagion effect that characterizes several debt and financial crises. In addition, our theory has implications for the timing of bailouts. In particular, the model provides an explanation for why we often observe the authority in charge of a bailing-out initially refusing to bail out at the beginning of a crisis. These dynamics are consistent with the behavior of spreads during the recent European debt crisis and the US financial crisis around the failure of Lehman Brothers.

**Composition of debt holdings** Most of the literature on sovereign debt crises is silent on the role of public debt held by domestic households and financial institutions and focuses on the role of external debt. However, this is a limitation for the analysis of debt crises where domestic public debt plays a prominent role. In [Bocola, Bornstein, and Dovis \(2019\)](#), we first document that in the case of Portugal, Spain, and Italy, total public debt (domestic and foreign) is a better predictor for interest rate spreads than standard indicators of external debt. We next show that we can reconcile the canonical [Eaton and Gersovitz \(1981\)](#) model with such evidence. Specifically, we derive theoretical conditions under which total public debt is a relevant state variable in the decision problem of the government. We then apply our framework to the European debt crisis. We show that

matching the cyclicality of public debt — rather than that of external debt — allows the model to better capture the empirical distribution of interest rate spreads and gives rise to more realistic crises dynamics.

In [Chari, DAVIS, and Kehoe \(2020a\)](#) we study the role of debt held by the domestic financial sector. In particular, we examine under which circumstances *financial repression* is optimal. Financial repression is defined as the regulation imposed by the government on banks and other financial intermediaries to force them to hold more government bonds than they would absent such regulation. Financial repression has been used in many instances historically. For example, [Calomiris and Haber \(2014\)](#) argue that as early as 1694, the founding of the Bank of England was based on the explicit premise that the bank was to lend money to the government at below-market rates. [Reinhart and Sbrancia \(2015\)](#) argue that in the post-WWII era, financial repression has been extensively used by the government as a tool to reduce the burden of government debt. Finally, in times of severe fiscal distress, such as in the recent financial crisis in Europe, banks have increased their holdings of their own government's debt.

In the paper, we show that such financial repression policies are optimal when the government cannot commit to repay its debt and fiscal needs are exceptionally high (for example, because of a war or a large recession), but they are not optimal under commitment. The key insight is that repression for the government is a costly way to purchase credibility, in that it has ex ante costs but increases ex post credibility about not defaulting.

Forcing banks to hold debt through financial repression has ex ante crowding-out costs, because this policy distorts the portfolios of banks by diverting scarce funds from investment to government debt. However, in times of exceptional fiscal needs, financial repression can be optimal, because such repression enhances the credibility of the government not to default in the next period on the debt it issues in the current period. This is because if a larger share of debt is held by banks, the option of defaulting is less attractive for the government. In fact, a government default without a bank bailout will lead to a reduction in banks' net worth, which, in turn, reduces economic activity. If the government chooses to bail out the banks to avoid such costs, the default option is still less desirable relative to the case where banks do not hold the debt, because the government must find scarce resources to finance the bailout. We show that the model can qualitatively produce the pattern for government debt and the share of debt held by banks observed in the United States post-WWII.

Our work has important policy implications. Policymakers have argued that financial institutions should be regulated so that they are allowed to hold only small amounts of their own country's government bonds (see [Weidmann \(2013\)](#) and the current policy discussion about the rules of the European Union's banking union). Our analysis implies that such a policy change could be costly because governments would be more tempted

to default, and thus the amount of debt a country can credibly issue would be reduced.

In [Dovis, Golosov, and Shourideh \(2016\)](#), we study the interaction between the sustainability of government debt and redistributive policies. The dynamics of fiscal and redistributive policies in developing economies often alternates between a populist and a consolidation phase, what [Dornbusch and Edwards \(1991\)](#) term *populist cycles*. In the paper, we propose a theory for these cycles. We show that the interaction between governments' lack of commitment and redistributive motives leads to cycles in fiscal policies that resemble the experience of Latin American economies and arguably Southern European countries recently. In the populist phase, the government implements redistributive policies supporting low- and middle-income workers, resulting in large primary deficits and an increase in the external indebtedness of the government. In the consolidation phase, austerity measures are implemented, the government reduces its primary deficits and its external debt position.

**Efficiency and normative implications** Most quantitative sovereign default models are designed to account for the behavior of interest rates, debt, and macroeconomic aggregates around sovereign debt crises. However, they are not well suited for normative policy analysis, because they impose ad-hoc restrictions on the set of securities that can be traded and the strategies that borrowers and lenders follow. Thus, policies that relax these restrictions would trivially improve outcomes. In contrast, another literature strand studies the optimal borrowing arrangement between the sovereign borrower and foreign lenders by explicitly stating the underlying frictions without imposing ad-hoc restrictions on the set of contracts that agents can write. These models are suited for normative analysis, but the data-model relationship is less transparent. This is because the optimal arrangement relies on financial contracts rarely observed in reality: debt contracts that explicitly index the amount to be repaid to the state of the economy.

In [Dovis \(2019\)](#), I take a first step toward bridging the gap between these two literature strands. I show that the dynamics of interest rates, debt, and macroeconomic aggregates around sovereign debt crises can be rationalized as part of the efficient borrowing arrangement between a sovereign borrower (i.e., the domestic government) and foreign lenders in a production economy where the sovereign borrower cannot commit to repay and has private information about the state of the economy (for example the level of productivity or the desirability of government spending). I show that the efficient allocation can be implemented as an equilibrium outcome of a *sovereign debt game* where only the securities considered in the quantitative literature are used: non-contingent defaultable debt of multiple maturities. This allows for a more transparent connection between the efficient allocation and the data because I derive implications for the objects of interest in the applied literature: debt holdings, interest rate spreads, and maturity composition of

debt.

I show that defaults along the equilibrium path are not a pathology; rather, they support the efficient allocation. Defaults are ex-post inefficient in that if the government and the lenders could renegotiate the terms of their agreement but commit not to do so again in the future, then both could be made better off. It is however optimal to have them from an ex-ante perspective because they help to provide incentives to the government. Moreover, the equilibrium path displays defaults when output is low, an inversion of the term structure of interest rate spreads when the spread level is high, and a negative correlation between the duration of outstanding debt and the probability of future defaults, as in the data.

The paper provides a different view on normative implications than the literature on incomplete markets. First, the negative correlation between the maturity of outstanding debt and the probability of a crisis emerges as a way to support the efficient allocation when only non-contingent defaultable debt of multiple maturities is available. Hence, the high reliance on short-term debt is just a symptom, and not a cause, of an imminent debt crisis, in contrast to the view in [Cole and Kehoe \(2000\)](#). Second, capital losses for long-term debt holders due to an increase in future default probability are essential to replicate the insurance prescribed by the efficient allocation given the available assets. Hence, introducing and enforcing seniority clauses to avoid these capital losses will lower welfare. Finally, because ex post inefficient defaults are part of the efficient allocation, interventions by a supranational authority such as the IMF aimed at reducing the inefficiencies in a sovereign default episode are not beneficial from an ex-ante perspective.

The implementation of the efficient allocation, and its implications for the optimal maturity composition of debt, is applicable to other contexts in addition to sovereign borrowing. For example, it can be fruitfully applied in a corporate finance context to study the optimal financing decision of a firm subject to similar informational and commitment frictions.

## **2 Credibility and reputation in government policies**

The inability of governments to commit to future policies often leads to undesirable equilibrium outcomes. For instance, the inability of a central government to commit not to bail out local governments induces local governments to overborrow and it can lead to debt crises like in Argentina in 2001. The inability of a monetary authority to commit can lead to inefficiently high and volatile inflation. It is then of first order importance to understand if there are institutional arrangements that can reduce the distortions introduced by the inability of governments to commit to future policies. In my research,

I study the optimal institutional design to overcome commitment problems. I focus on two main applications: the adoption of fiscal rules in federal governments to overcome the overborrowing of local governments and the creation of monetary unions as a way to increase credibility of monetary policy.

**Policy and fiscal rules** Since [Kydlan and Prescott \(1977\)](#), a large literature in macroeconomics has grappled with the problem of designing policies when there are time inconsistency problems. Policy rules – e.g., fiscal rules, inflation targets – are often proposed as a solution to *time inconsistency* problems (i.e., when future policies optimal from the initial period perspective are not optimal ex post). The implicit assumption is that society can credibly impose rules on policy makers. However, at the time when rules and regulations are formulated, there is often substantial uncertainty about whether policy makers can resist the temptation to deviate ex-post. In my work with Rishabh Kirpalani, we study the implications of this uncertainty for policy rules.

In [Dovis and Kirpalani \(2020\)](#), we focus on the effectiveness of fiscal rules to restrain spending in federal governments. There are numerous examples throughout history in which excessive spending and debt accumulation by subnational governments led to transfers or bailouts by central governments. Examples include provinces in Argentina before the debt crisis of 2001, states in Brazil in 1991, and most recently countries (Greece, Ireland, and Portugal) in the European Union. One view of such events is that the inability of central governments to commit to not transferring resources to indebted regions leads to profligate fiscal policies ex ante, which in turn justifies the transfers ex post. A commonly held view is that fiscal rules can correct these incentives to overborrow. In practice, fiscal rules take the form of limits to debt-to-GDP or deficit-to-GDP ratios along with some penalty if these are violated. A natural question that arises is why central governments can commit to enforcing these rules if they cannot commit to not bail out.

We ask if fiscal rules can be beneficial if central governments cannot commit to enforcing the fiscal rules and if these rules will arise in equilibrium. We address these questions in a reputation model in the tradition of [Kreps and Wilson \(1982\)](#) and [Milgrom and Roberts \(1982\)](#). The central government can be either a commitment type with the ability to commit or a no-commitment type. The type of the central government is unknown to local governments, and they infer it from its actions. The reputation of a central government is the probability that local governments assign to it being a commitment type.

Our first main result is that if the reputation of the central government is low enough, then not only fiscal rules are ineffective, but they lead to even more debt accumulation relative to the case with no rules. This is because the punishment associated with the fiscal rule enforcement makes it more attractive for the no-commitment type to reveal its type earlier relative to an environment without fiscal rules in the constitution. This early res-

olution of uncertainty makes overborrowing more attractive for the local governments. In contrast, if the central government's reputation is sufficiently high, fiscal rules are effective in reducing borrowing by local governments. We show that these predictions are consistent with suggestive evidence from European countries.

This naturally leads to the following question: why do we often observe governments with arguably low reputation institute fiscal rules if they lead to worse outcomes? See for instance the Fiscal Responsibility Law introduced in 1997 in Brazil after most of states were bailed out by the central government and the strengthening of the Stability and Growth Pact in the European Union after the Greek bailout. The second main result of the paper is to provide a rationale for these observations. We show that fiscal rules arise in equilibrium because the commitment type wants to signal its type to the local governments. We also show that it is optimal for the no-commitment type to mimic the commitment type and institute a fiscal rule even if it anticipates that it will not enforce the rule in the future. This because a failure to institute the fiscal rule would immediately reveal the government's type and encourage overborrowing by local governments.

In [Dovis and Kirpalani \(2021\)](#), we study how policy rules should be designed considering both the uncertainty about the policy makers' ability to follow the rules ex post and their reputation-building incentives. We study the optimal design of policy rules in a dynamic game between policy makers and private agents in which the policy maker's ability to commit to follow the rule is private information. As in the previous paper, the policy maker can be either a commitment type with the ability to commit or a no-commitment type. We define the private agents' beliefs about the ability of the policy maker to commit as the policy maker's reputation.

The main result of our paper is that if the initial government's reputation is low enough, the optimal rule should be designed to preserve uncertainty in future periods because such uncertainty promotes good behavior by private agents. This is implemented by introducing leniency in the policy rule. In contrast, if the initial reputation is high, the optimal rule should promote learning about the policy maker's type. We also show that designing opaque rules can be beneficial when reputation is high since they help preserve uncertainty about the policy maker's type without the need to introduce leniency in rules.

The insights from our theory can be applied to many relevant policy design questions including the design of central bank mandates, fiscal rules in federal governments, and financial regulation. Consider, for instance, the optimal design of financial regulation. As is well understood, in a large class of economies, if regulators can commit, a no-bailout policy is optimal to prevent excessive risk taking by financial institutions ex ante. Creditors should be forced to take losses in the event of default (bail-in). If the reputation of regulators is not sufficiently high, our analysis suggests that allowing for partial bailouts in equilibrium is optimal. We show that, contrary to conventional wisdom, bailouts along

the equilibrium path are necessary to discipline future risk-taking of financial firms, as they preserve the uncertainty about the type of the policy maker.

**Optimal currency areas** A classic question in monetary economics is which countries or states should share the same currency. The traditional optimal currency area view, stemming from the analyses of [Friedman \(1953\)](#) and [Mundell \(1961\)](#), is that countries that leave a flexible exchange rate regime in order to join a monetary union give up their ability to tailor their monetary policy to respond to their idiosyncratic shocks. This inability to set monetary policy independently is a major cost of a monetary union. Hence, countries with similar shocks have the least to lose from forming a union and should do so if the benefits from, say, increased trade, outweigh this cost. This traditional criterion implicitly assumes that countries have no credibility problems. However, considerations about the credibility of monetary policy were of first order importance for the decision of southern European countries to join the Euro. As a partial confirmation, the level and the volatility of inflation for these countries fell after joining the Euro confirming this view.

In [Chari, DAVIS, and Kehoe \(2020b\)](#), we revisit these analyses using a simple sticky price model assuming that the monetary authority cannot commit to its policy. We show that when countries face substantial credibility problems, the loss of monetary independence is a major benefit of joining a monetary union. Indeed, these benefits increase with the variability of certain country-specific shocks and can lead to a monetary union being preferred to flexible exchange rates even absent trade benefits.

Without commitment, policymakers have incentives to deviate from the commitment plan to generate surprise inflation. These incentives can be heterogeneous across countries. For example, because countries face different degrees of monopolistic distortions that can be mitigated by surprise inflation. We label shocks that affect these incentives to generate surprise inflation *temptation shocks*. The inability to respond to the country-specific component of temptation shocks can confer *credibility gains* to member countries. This is because for the common monetary authority the high temptation to inflate ex-post in one country is mitigated by the low temptation in another country. Thus, there are credibility gains only if temptation shocks have a sizable idiosyncratic component. This insight leads to a new criterion for optimal currency areas: a group of countries without commitment should form a union if their temptation shocks are sufficiently dissimilar and their Mundellian shocks – i.e., shocks the monetary authority wants to respond to ex-post - are sufficiently similar.

Consider applying our analysis to the European Monetary Union. Our model captures the idea that many of the southern European countries gained credibility by joining a union populated mainly by northern European countries and hence reduced the inflation bias in the southern countries. Interestingly, it also provides a motivation for why

the northern European countries might want to admit countries with historically lower credibility in monetary policy.

In [Chari, DAVIS, and Kehoe \(2017\)](#), we offer a theoretically based narrative that attempts to account both for the formation of the European Monetary Union and the challenges it has faced. A novel aspect we emphasize is that the presence of a common central bank can induce members of a union to voluntarily engage in tax financed bailouts. This is because a benevolent central bank that lacks commitment has strong incentives to engage in inflationary bailouts of governments of distressed countries in financial crises, even if the inflation imposes costs on the residents of less distressed countries. This threat that the monetary authority will act induces fiscal authorities to bail out distressed countries by forgiving debt or making their own transfers to prevent the monetary authority from deviating too much from the optimal monetary policy from these countries' perspective. Indeed, such fiscal bailouts may be large enough that the central bank ends up not engaging in any inflationary bailouts at all. The anticipation of such fiscal bailouts induces the governments of countries in a union to borrow inefficiently large amounts from the residents of other member countries in the union. In this sense, the mere presence of a benevolent central bank introduces externalities in other policy areas.

This mechanism can account for the substantially higher assistance received by Greece from the Troika consisting of the European Monetary Union, the European Commission, and the International Monetary Fund than essentially any emerging market economy did from external sources during its crises. Viewed through the lens of our model, the Troika rationally acted to forestall the European Central Bank from acting on its own. The mechanism also helps to understand the current policy debate in the European Monetary Union and the support for the Next Generation EU program with grants for countries more heavily hit by the COVID pandemic. Through the lens of the model, the program is a way to ease the trade-off faced by the European Central Bank tasked with reducing inflationary pressures without triggering a debt crisis in more heavily indebted countries.

### **3 Financial market imperfections and aggregate outcomes**

Imperfections in financial markets limit the ability of households and firms to share risk, respond to shocks like fluctuations in income, and invest. These imperfections are critical to study distributional issues, but are they important for aggregate outcomes? My research makes progress on this question in two areas. First, in my work with David Berger and Luigi Bocola, we propose a method to quantify the importance of credit market imperfections that limit the ability of households to insure against idiosyncratic shocks for business cycle fluctuations. In an application to the US economy, we find these frictions

account for only 7% of GDP volatility on average but can have much larger output effects when monetary policy is constrained. Second, in my work with Wyatt Brooks, we study whether financial imperfections matter for the aggregate gains from a trade liberalization. We show that if the amount that firms can borrow depends endogenously on future profitability, then the degree of credit market frictions does not matter for the desirability of the trade reform.

In [Berger, Bocola, and Dovis \(2020\)](#), we address a classic question in macroeconomics: Are households' heterogeneity and deviations from perfect risk sharing important for aggregate fluctuations? If financial markets are frictionless and households can insure against their idiosyncratic shocks, the aggregate equilibrium outcome is the same as the one in an economy with a properly defined "representative" or "stand-in" household. Thus, heterogeneity does not matter for aggregate fluctuations. What if markets for idiosyncratic risk are not perfect? Starting from the influential result in [Krusell and Smith \(1998\)](#), the consensus view was that idiosyncratic risk and missing insurance markets were not important for business cycle fluctuations. After the Great Recession, many researchers started to reassess this question. Several studies suggested that the fall in aggregate consumption was partly due to tighter debt limits and heightened households' precautionary savings motives. These analyses, surveyed in [Krueger et al. \(2016\)](#) and [Kaplan and Violante \(2018\)](#), made significant contributions by clarifying the mechanisms through which shocks and frictions at the micro level can propagate to the aggregate in economies with nominal rigidities. It remains however challenging to quantify these mechanisms, as their strength is dependent on several modeling choices, such as the assumed set of risk-sharing mechanisms available to households, the nature of their idiosyncratic risk, and the timing and distribution of fiscal transfers.

We propose a method to quantify the importance of imperfect risk sharing for the business cycle and to help researchers discipline these modeling choices. We show that, for a large class of heterogeneous agent New Keynesian economies with potentially incomplete financial markets, the contribution of imperfect risk sharing to aggregate fluctuations is fully summarized by two statistics of the equilibrium cross-sectional distribution of households' consumption shares and relative wages. We call these two statistics preference wedges, because they can be interpreted as a time-varying discount factor and disutility of labor in an otherwise standard representative agent economy.

We measure these wedges using household-level data from the Consumption Expenditure Survey and use this representative-agent interpretation as a measurement device. In our application, we find that deviations from perfect risk sharing account for only 7% of output volatility, but they can have much larger effects when nominal interest rates reach their lower bound. In an event study, we find that they account for one-fourth of the output drop observed during the Great Recession from 2007 to 2009.

In [Brooks and DAVIS \(2020\)](#), we study the role of credit market imperfections in reducing the beneficial reallocation of resources that follows the removal of distortions such as tariffs or industry-specific subsidies. The existing literature – see for instance [Buera and Shin \(2013\)](#) and [Song et al. \(2011\)](#) – suggests that credit market imperfections limit the gains from undergoing such reform. These analyses assume that the amount of credit that firms can raise is exogenous to the reform. We show that if the amount of credit is endogenous and related to the firm’s future profitability, then after a trade liberalization, exporters expand and non-exporters shrink efficiently, allowing for the same percentage gains from reform as with perfect credit markets. We then use a trade liberalization in Colombia to contrast the firm-level implications of our model to the ones of a model with exogenous debt limits and find evidence in favor of the endogenous formulation. Thus, suggesting that the benefits of trade liberalizations are not smaller in countries with less developed financial markets as predicted by the existing literature.

## 4 Outlook on future research

I plan to keep on working on these themes building on my existing work. One area I am particularly interested in is the study of policies and institutions that can ensure that a constrained efficient allocation is uniquely implemented. In many applications, competitive equilibria can attain the efficient allocation but coordination failures among investors can lead to suboptimal equilibrium outcomes. For example, in [Davis \(2019\)](#), I show that the efficient allocation can be implemented as an equilibrium outcome of the sovereign debt game, but there are multiple equilibria and not all equilibria are efficient. Thus, even though agents can achieve the efficient outcome in a market setting, interventions by a supranational authority may indeed be helpful in avoiding inefficient equilibria. In work in progress with Rishabh Kirpalani, we are studying which kind of policies can uniquely implement the constrained efficient outcome.

In another work in progress with Rishabh Kirpalani, Giorgio Meucci and Stefano Pietrosanti, we are studying the effects of bailout expectations on banks’ funding costs and their implications for prudential policy. We exploit the introduction of the Banking Recovery and Resolution Directive and its application to identify episodes that are informative about the regulator willingness to bailout bond holders. We then study how bond prices react to these events. The effects on prices can be decomposed in an anticipated bailout subsidy component and a rollover risk component. Using a strategy similar to the one developed in [Bocola and Davis \(2019\)](#), we are planning to use data on the maturity structure of newly issued debt by Italian banks to distinguish each of these two components and use these estimates to inform the size of optimal prudential taxes that correct for the

expected bailout subsidy.

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