

COVID Credit Policies Around the World: Size, Scope, Costs and Consequences

Gee Hee Hong, IMF

Deborah Lucas, MIT

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1. Introduction

Governments around the world deployed credit policies during the Covid19 pandemic on a historically unprecedented scale. Those policies included loan guarantees, direct government lending, large-scale forbearance programs that allowed millions of households and business to temporarily stop making payments on certain debt obligations, and the loosening of regulatory restrictions on banks. Advanced economies used both credit policies and traditional fiscal policies to a much greater extent than did emerging market and developing economies (EMDEs). Our quantitative analysis focuses on the credit policies of seven large advanced countries (France, Germany, Italy, Japan, Spain, United Kingdom, and United States) that in dollar terms accounts for most credit policies that were implemented globally. The restriction of the analysis to those countries is for reasons of data availability, but the conceptual issues discussed are relevant to governments anywhere that are considering the use of credit policies as a complement to or substitute for traditional fiscal policies.

While a growing body of work studies various aspects of these credit policies, this paper appears to be the first to estimate the effective size of these policies in a way that allows aggregation across credit support, forbearance, and traditional fiscal policies, with the aim of producing statistics that can be used to explore the connections between these policies and various macroeconomic outcomes. Specifically, we introduce the idea of “incremental resources provided” as a unifying concept for sizing credit support, forbearance, and traditional fiscal programs. We operationalize that idea by equating size to principal take-up for government loan and loan guarantee programs; equating size with total avoided payments for forbearance programs; and equating size to reported expenditures for traditional fiscal policies. The size estimates for large-scale credit forbearance programs are an original contribution of this paper, while those for direct lending and guarantee programs are taken from Hong and Lucas (2023), and incremental fiscal spending is taken from the October 2021 release of the IMF database on fiscal policies in response to COVID19.¹

We use these size statistics, separately and in combination, to reassess governments’ policy footprints during the pandemic, and also to explore whether taking large-scale credit and forbearance policies into account can better explain the realized cross-country differences in macroeconomic outcomes such as real GDP growth, private savings rates and inflation. To briefly preview the main findings, we show that these credit policies significantly increased the resources in the pockets of firms and households, bringing the average share of incremental resources provided from 14.5% of 2020 GDP when only fiscal policies are considered, to 22% when credit support and forbearance policies--as measured by take-up and missed payments--also are added in. Including those policies also paints a quite different picture of the relative aggressiveness of government policies across these countries. Whereas there is considerable variation in the use of traditional fiscal policies, the variation in resources provided as a share of GDP is much lower when credit and forbearance policies are also taken into account. Furthermore, increases in savings rates between 2019 and 2020 across countries are highly correlated with the combined size of credit and fiscal policies, although forbearance policies have a negative correlation with savings rates. The much higher and more uniform levels of incremental resources provided by European and the U.S. governments, and likelihood that a significant fraction of those

¹ <https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>. The database was regularly updated from the onset of the pandemic to track governments’ above-the-line and below-the-line activities that are categorized by the IMF as fiscal.

resources were initially saved rather than spent, is consistent with pandemic fiscal and credit policies having significantly contributed to the sharp increase in subsequent inflation in all of these countries. In fact, the increase in private savings is highly correlated with inflation cross-sectionally. However, we find no direct correlation between the cross-section between inflation rates and the size of these policies. Also suggestive of the importance of credit support and forbearance policies is the finding of a much stronger correlation between the cross-section of GDP growth between Q3 2020 and Q3 2021 and our broad measure of incremental resources than with traditional fiscal spending alone.

There are a number of foundational conceptual issues related to credit and forbearance policies that are briefly discussed in the Section 2. Those include how the policies should be quantified, both for macroeconomic policy evaluation and for budgetary purposes, and why different approaches are required in each case; how to think about the transmission channels of credit policies and their interaction with fiscal and monetary policies; how to choose multipliers to convert raw measures of incremental resources into a more precise estimate of the contribution to aggregate demand from a given policy; the pros and cons of the different types of policies along multiple dimensions; and how in principle budgetary costs should be calculated versus how governments account for credit policies in practice.

In Section 3 we turn to the task of quantifying the incremental resources provided by each of the major credit support and loan forbearance programs, and then aggregate the results in the two broad categories for each country. We also report estimates of the fiscal (i.e., upfront budgetary) cost for the direct lending and guarantee programs on a fair value basis, drawing on our recent estimates in Hong and Lucas (2023). Notably, the fiscal cost is typically much lower than the incremental resources provided, averaging 37% of the principal borrowed, because some or most of the funds will be repaid.² The estimated costs vary significantly across the programs depending on the generosity of program terms and the riskiness of the borrowers. We also describe the relaxation of regulatory rules that enabled banks to participate in these programs without incurring penalties. The important take-away from those policies is that by lowering risk-weighted-assets and raising consumer credit scores, they may have caused an overly rosy perception of the health of banks and the financial system. Section 4 reports on the macroeconomic results described earlier, and Section 5 concludes.

2. Effects of credit policies on fiscal and macroeconomic outcomes: Conceptual issues

A fundamental challenge for our analysis is one of measurement: How to best quantify credit policies so as to make them most comparable to traditional fiscal policies? Our preferred answer will differ depending on the outcome of interest. For example, we suggest that a credit program's effects on aggregate demand (i.e., stimulus effects) are best measured with an estimate of the incremental amount of cash the program puts into the pockets of households and firms, scaled by an appropriate multiplier that reflects factors such as the propensity of the recipients to spend the money rather than to save it. We also use an incremental cash approach to look for macroeconomic effects that are related to aggregate demand, such as GDP growth, saving and inflation. However, we argue that a credit program's *ex-ante* fiscal cost (or equivalently, its properly measured budgetary cost) should be evaluated in present value terms on a fair value basis in order to make program cost estimates most comparable to those for traditional fiscal policies.

² This excludes the U.S. Paycheck Protection Program, which was effectively a grant program.

In addition to addressing measurement issues, as a prelude to the quantitative analysis it is useful to consider (1) the major types of credit policies introduced during the pandemic and their salient similarities and differences to each other; (2) transmission channels for credit policy, and the interaction of credit policies with monetary and fiscal policies; (3) the pros and cons of using alternative types of credit assistance and cash payments in terms of efficacy and cost effectiveness; and (4) how the cost of credit policies should be calculated versus how they are reflected in official government accounts. In this section we lightly touch on each of these issues and the reasons for the measurement choices made, and point the interested reader to some of the related literature on these topics for more detailed discussions.

2.1 Types of credit policies and comparisons between them

A credit policy can be defined as a policy that affects the terms or availability of credit to households, firms, or sub-national government entities. Here we classify the pandemic-era credit policies that we consider as falling into three broad categories.

The first category includes government loan guarantees and direct government lending. New loan guarantee programs for firms were the most prevalent form of credit assistance introduced in response to the pandemic. Loan guarantees and direct government loans typically are grouped together (e.g., by the IMF and the US Congressional Budget Office) because their benefits to borrowers and costs to the government are similar, holding the underlying loan and borrower characteristics constant. The similarities arise because through either form of support, the government absorbs some or all of the credit risk without being fully compensated for the cost of doing so. Furthermore, both types of assistance effectively put the government's credit rating in place of the borrower's rating. That allows firms and households that could not qualify for a traditional bank loan to gain access to credit, an often-powerful extensive margin effect.

Whereas the economic effects of guaranteed loans and direct government lending are similar, there are several differences worth noting. The participation of private sector lenders in direct lending programs entails additional costs and benefits. It typically involves higher government cost because lenders have to be compensated for the costs and risks of their involvement, and that compensation may be in excess of what is required to induce participation. Part of that higher cost may be offset by efficiency gains, such as when private lenders are better at screening borrowers or performing other administrative functions. For the government, the two types of credit support have very different effects on its balance sheet and the amount of government debt outstanding. Direct lending typically involves increasing government debt by the principal amount extended, and the loans are recorded on the asset side of the balance sheet. By contrast, credit guarantees do not entail any additional government borrowing, and they are generally treated as off-balance-sheet. Budgetary accounting for credit varies more widely across countries and in many cases is misleading, as discussed below.

A second category of credit policies that several governments introduced on an unprecedented scale during the pandemic were various types of payment holidays. These policies, which we refer to generically as forbearance policies but in some cases were called payment moratoriums, allowed borrowers with existing debt obligations to cease making scheduled payments without penalty for some period of time. As with guaranteed and direct lending, forbearance policies provided additional cash to households that would eventually need to be repaid. Effectively, forbearance is like a short-term loan that is used to cover the payments coming due on existing debt. However, COVID forbearance policies

often had a shorter maturity than guaranteed and direct loans, with the former typically ranging from a few months to a year, and the latter typically lasting for 3 to 10 years. The scale of funds provided relative to the underlying loan size is also different. With forbearance, the additional cash provided is the sum of missed payments over the life of the forbearance policy, whereas with a guaranteed or direct loan it is the entire principal amount. As discussed in Section 3.2.2, the size and incidence of the costs of forbearance varied considerably with the way the policies were structured. An important distinction is between forbearance programs that are imposed on private sector creditors and therefore that entail hidden taxes, and those whose costs are borne by the government.

A third category of credit policies that were important during the pandemic were changes to financial regulations—such as the rules governing when a loan is reported as non-performing and how it is reported to credit registries. As explained in Section 3.3, regulatory requirements were relaxed to encourage program participation by both lenders and borrowers. Without those accommodations, the take-up of forbearance and guaranteed loans could have been much lower.

Some actions by central banks fall into the first category of direct lending or loan guarantees, but only some of those policies are included in this analysis. Newly created direct lending and guarantee programs that were administered by central banks and backstopped by a fiscal authority were included. For example, we include the U.S. Main Street Lending program, which was administered by the Federal Reserve but whose losses were backstopped by the Treasury under the CARES Act. In principle we should also include any primary market purchases of private sector securities by central banks, but we did not obtain data to incorporate the effects of those purchases.

Other central bank policies would fall into a fourth category of credit policies that have more indirect effects on aggregate demand and limited fiscal cost. As such, they would require a different sort of analysis than the one in this paper. Those include purchases of private sector securities in the secondary market (which don't provide any new funding to firms), and the massive purchases of government securities that accommodated the fiscal response to the pandemic. In addition to outright securities purchases, central banks expanded their liquidity programs, reopening facilities created in response to the Global Financial Crisis and in some instances adding new ones. For example, the European Central Bank expanded its targeted longer-term refinancing operations (TLTRO) III and introduced the Pandemic Emergency Purchase Programme (PEPP). The Federal Reserve reopened many of the facilities it created during the GFC and added some new ones. While those liquidity facilities had the legal capacity to purchase trillions of dollars of securities, by design they took on very little uncompensated credit risk and didn't directly increase the supply of loanable funds to firms and households.

2.2 Transmission channels, and the relation of credit policy to fiscal and monetary policy

The basic transmission channel from all expansionary demand-side policies to the macroeconomy—credit, fiscal or monetary—are broadly similar. All increase the resources available to households and firms, and thereby encourage additional spending that in turn affects output, prices and so forth.

The specifics of the mechanisms differ. Expansionary monetary policies make borrowing cheaper, encouraging investment and consumption (and vice versa for contractionary policies). When expansionary monetary policy is used to accommodate debt-funded government spending, that too can put upward pressure on prices. Expansionary fiscal policies, for example extended unemployment benefits or tax cuts, lead to increased spending that puts upward pressure on prices and output.

Expansionary credit policies lower the cost of credit and increase its availability, encouraging increased consumption and investment that in turn influences macroeconomic outcomes.

It is important to emphasize that the intent of expansionary policies during COVID was not to spur an increase in consumption during a period where people were encouraged or forced to stay home. Rather, the policies were intended to tide over households and businesses through a period of reduced economic activity, for instance allowing firms to retain workers and remain going concerns, and allowing households experiencing a temporary drop in income to continue covering fixed expenses such as mortgage or rental payments. Some described the policies as providing social insurance rather than as stimulating spending. However, the policies did increase aggregate demand relative to what it would have been in the absence of those policies, and hence it is reasonable to think of them as providing stimulus through aggregate demand effects.

Rather than according credit policy independent status, credit policies are generally treated as a subcategory of monetary, fiscal and regulatory policies. While it is true that credit policy has aspects related to these other policy types and that it interacts with them, we hope something readers will take away from this analysis is that assessing the effects of credit policies accurately requires considering them separately in their own right.

In fact, credit policies have aspects that are fiscal, monetary or regulatory. There is a fiscal element *ex ante* when a policy involves subsidies or *ex post* when it affects the future finances of the government, e.g., when there are future payouts on loan guarantees. There is a monetary element when a credit policy originates from a central bank. There is a regulatory element when the policy affects administrative rules or legal restrictions. As with fiscal policy, credit policies can be passive in that the effects arise from standing policies, or active as when they are introduced in response to a shock. Also as with other government policies, their effects will vary over the business cycle and with other factors, making the magnitude and timing of their impacts difficult to predict.

In terms of policy interactions, credit policies affect the transmission mechanism of other types of policies, particularly monetary policy, by either blocking or amplifying their effects. The significance of those interactions can be illustrated by considering two historical examples. During the Great Recession, mortgage credit policy partially blocked the normal transmission mechanism for US monetary policy. Typically, one of the main ways that monetary policy easing helps households is via a mortgage refinancing channel. Households are able to reduce their monthly payment obligations by refinancing their mortgages at lower rates. However, because mortgage credit policy prevented the refinancing of government-backed mortgages on homes whose value had fallen sharply or where minimum income requirements were no longer satisfied because of job loss, the volume of refinancing was much lower than would normally have been expected with such a large drop in interest rates (Lucas et. al., 2011).

The interactive effect of credit policies with monetary policies during COVID was the opposite. Both in the U.S. and internationally, credit policies amplified the effects of monetary policy easing. Loan guarantees, direct lending, forbearance, and relaxation of regulatory policies significantly reduced the barriers for households and firms to take advantage of the low level of real interest rates.

2.3 Credit policy multipliers

In order to evaluate the combined macroeconomic effects of credit policies and fiscal policies, a natural question is whether some scaling factors for our estimates of the additional cash made available are necessary to make the different policies more comparable to each other and to traditional fiscal expenditures? An example of such scaling is in Lucas (2016), which uses a multiplier framework to translate an estimate of the incremental borrowing from U.S. credit support programs during the Great Recession into stimulus estimates that are comparable to those for fiscal policy.

For loan guarantee and direct loan programs, we use “take-up” (the total principal amount borrowed), as the raw measure of incremental resources obtained by program participants. For forbearance programs, the estimated sum of skipped payments is the corresponding raw measure. The incremental fiscal expenditures are the government-reported cash costs of grants, tax cuts, and other discretionary spending, as reported by the IMF. Using take-up as the proxy for incremental cash made available by guarantee and direct lending programs presumes that the loans would not otherwise have been made. For the SME programs, which account for a large portion of total take-up, it is reasonable to assume that there would have been limited credit availability without government support, or that rates would have been so high as to discourage most borrowing.³ For the programs serving larger firms, presumably some would have obtained funding in the absence of government support and take-up probably overstates incremental resources provided.

Choosing multipliers to convert these raw measures of incremental resources into an estimate of their contribution to aggregate demand is especially challenging for the pandemic period. As noted earlier, the intent of assistance programs during COVID was quite different than that of stimulus programs during past recessions. Rather than to bolster aggregate demand, the assistance was intended to tide over individuals and firms through a period of drastically reduced incomes and heightened uncertainty so as to be able to cover basic needs and minimize displacement. Auerbach and others (2021) address these challenges to multiplier estimation in the context of fiscal policy, and emphasize that multipliers were much higher in places with less strict lockdown orders.

Given the difficulty of inferring multipliers for this period, in the analysis that follows we have not applied any scaling factors to our raw estimates of the incremental cash provided by credit assistance programs or fiscal expenditures. However, it is worth considering, at least qualitatively, the extent to which the incremental cash provided via credit programs could be expected to have increased aggregate demand, and the reasons the effects may be larger in some programs than in others.

2.3.1 Guaranteed and direct lending programs

There are several reasons to expect that a significant share of the funds borrowed were retained for precautionary purposes rather than immediately spent: Demand was subdued by lockdowns; caution and economic uncertainty were high; and the subsidies in some of these programs were large enough to make it worthwhile to borrow even if there was no immediate use for the funds. To the extent borrowed funds were spent, for the same reasons the size of subsequent rounds of spending that were

³ Lucas (2016) assumed variation across U.S. government credit programs in incremental resources made available during the Great Recession, with borrowing under programs like student loans judged to be largely incremental and borrowing under government mortgage programs less incremental.

triggered may have been much smaller than in a typical recession. These considerations point to smaller multipliers than in prior recessions.

Anecdotal evidence about how the borrowed funds were used supports a higher-than-normal propensity to save the borrowed funds. For instance, according to the British Business Bank, 23 percent of SMEs had spent all their facilities, and 19 percent had not spent any by 2020Q3. The gross savings statistics reported in Section 4 also suggest a high propensity to save during this period.

The question remains of whether the multipliers applied to take-up amounts should be lower or higher than those that are on average attached to traditional fiscal expenditures. Lucas (2016) noted that credit multipliers will tend to be higher than fiscal multipliers, all else equal, because it is costly to borrow and people will refrain from doing so unless they intend to spend the money. However, for the reasons just mentioned, during the pandemic it was relatively low-cost to borrow and the demand for precautionary stockpiles of cash was likely to be elevated. Lacking a basis for adjusting the relative multipliers on credit and traditional fiscal assistance, we concluded that a neutral choice was to set them to be the same and equal to one.

2.3.2 Forbearance

Forbearance policies provided additional cash to affected firms and households in the amount of the skipped payments. The additional cash-on-hand provided funds that would have been otherwise unavailable for spending or for saving. Because most or all of the money had to be repaid eventually, and often with additional accrued interest, the policies should have had minor wealth effects. The primary transmission channel is therefore most likely to be via the effective relaxation of borrowing constraints. These effects are akin to other forms of credit support that operated primarily through increased borrowing on the extensive margin, as discussed at length in Lucas (2016).

The questions of (1) how much of the missed payments were saved rather than spent, and (2) whether the propensity to spend out of the additional funds was similar to the propensity to spend out of incremental borrowing from guaranteed or direct lending programs or from fiscal policies, can't be answered with the aggregated data we have available. It seems likely that the propensity to spend varied depending on whether a program was for households or firms, and on other borrower and program characteristics. In programs where forbearance was automatic or close to it, more of the funds were likely to have been saved than in programs where some demonstration of hardship was required. There may also have been a lower average propensity to spend than for guaranteed and direct loans, which even at subsidized interest rates entailed higher costs, more effort, and more selectivity.

A further consideration regarding the spending impact of forbearance programs is whether there was a partially offsetting effect from creditors that may have reduced spending or lending to other borrowers, especially those where forbearance arose from an uncompensated mandate.⁴ Given the regulatory forbearance discussed below to accommodate these programs and the generally strong capital ratios of banks, we expect these offsetting effects to have been modest.

⁴ We thank Alan Auerbach for pointing this out.

2.4 Policy tradeoffs between credit, forbearance and fiscal policies

We will see that credit support and forbearance policies appear to have been used both as substitutes and complements to traditional fiscal policies during the pandemic. What criteria should have guided the policy mix? An investigation into these questions is important for informing future policy choices. While an in-depth analysis of the quality of choices made during the pandemic is beyond the scope of this paper, it is useful to evaluate the tradeoffs in general terms. Here we briefly discuss some of these considerations, which are also addressed in Lucas (2021).

In choosing between different types of policy responses, important considerations include efficacy, target efficiency, transparency, the costs of financial distress to households and firms, and government cost. In terms of target efficiency and cost transparency, traditional fiscal policies (i.e., cash transfers, tax cuts and in-kind assistance) will often dominate credit. Such assistance usually reaches the targeted recipients, and it can be distributed relatively quickly and through existing administrative structures. With some notable exceptions, it is transparent who benefits and how much they receive. It doesn't create an overhang of future obligations on recipients. Importantly, cash can help poorer households and proprietors who are less connected to credit markets. For instance, landlords benefit from mortgage forbearance and renters benefit from cash rental assistance. Cash transfers also have the advantage of greater cost transparency.

The main disadvantage of traditional fiscal measures is that they are expensive, costing dollar for dollar the amount of purchasing power provided. That can make it infeasible to provide a meaningful level of assistance on a large scale. When the goal is to offset a big but probably temporary drop in income, or to mitigate a sharp contraction in the availability of credit from private financial institutions, credit support can be an attractive alternative.

The cost of credit support to the government can be quite low relative to the amount of funds that are made available, making it a potentially cost-effective way to get money into the hands of people and businesses during times of crisis when liquidity is scarce. That's because most obligations incurred are likely to be eventually repaid. Further, the obligation to repay makes it more credible that those applying for funds truly need the money.

However, the stated advantages of credit presume a program that is well-designed so as to reach borrowers that are likely to have the capacity to repay, and to screen out those that are not targets for assistance. A striking example of a credit program that had none of these potential advantages was the U.S. Paycheck Protection Program, whose design has been criticized as a poorly disguised grant program that lacked transparency and target efficiency. A further consideration is that defaults are costly to all parties involved--the defaulting borrowers, lenders, and the government agencies administering the programs. When those costs are taken into account, a loan program with a high expected default rate is likely to be more expensive than providing a similar amount of cash assistance.

Already-high government debt levels and restrictions on deficit spending may discourage some countries from increasing traditional fiscal assistance. Credit, for better or worse, may be a legal way to avoid constraints on traditional spending. Large cash transfers also are more likely to raise issues of fairness than debt obligations that have to be repaid.

Among credit policies, a well-crafted forbearance program can have several advantages under certain circumstances. It can get money out the door quickly with little new bureaucracy, and it can be targeted fairly tightly, such as at residential mortgages with some maximum balance. When the government already bears most of the credit risk for loans to borrowers that are targets for assistance, the incremental cost and risk of forbearance is likely to be small. This is particularly true in the U.S., where, through its mortgage, student loan, small business, agricultural, emergency and other lending programs, the federal government is the largest provider of credit to U.S. households. Many of those programs already allowed for forbearance during an emergency without additional legislative action, which made it possible to quickly put the policies into motion. Beyond the direct benefits of reducing cash needs, forbearance policies can avoid longer term economic damages to employment and access to credit markets by protecting household credit scores.

Forbearance can also have a downside, as discussed at greater length in Section 3.2.2. It can only help the limited number of households and firms with existing debt, and this group is likely to be relatively well-off. When it is combined with partial forgiveness of principal or interest, its costs can be much higher and more akin to cash grants, and those policy changes may skip the discipline of recognition in the budget process. Forbearance can be target-inefficient when it is made available without consideration of need. The U.S. student loan moratorium is an example that has all of these drawbacks. Forbearance also can be used as a way to avoid recognizing fiscal costs by imposing costs on the private sector. For example, in the case of U.S. mortgage forbearance, servicers were compelled to continue to pay the holders of mortgage-backed securities even on mortgages that had stopped making payments. Bank loans subject to loan moratoria in Europe also presumably involved uncompensated costs to banks.

New credit guarantee or direct lending programs are harder and slower to put in motion than forbearance policies, often requiring new legislative authority, obtaining special expertise from outside government, delays associated with vetting borrowers, etc. Nevertheless, they can reach firms and households that don't have existing debt, which are often more in need of funds than those that already have a connection to the credit market. The statistics on government cost reported in Hong and Lucas (2023) and reported below suggest that most of the credit support programs introduced during the pandemic had a significantly lower government cost than had the same amount of funds been provided through traditional fiscal spending.

2.5 Estimating and accounting for the fiscal cost of government credit support

What is the most policy-relevant way to assess and budget for the fiscal cost of credit support? And how does the answer compare to how it is budgeted for in practice? We discuss these issues at length and apply them to the COVID guarantee programs in Hong and Lucas (2023). The main takeaways are briefly summarized here; the interested reader is referred to that paper and references therein.

The policy-relevance of budget estimates depends on the purposes for which they're used. Arguably, the most important purpose is as an input to help policymakers understand the tradeoffs between competing uses of fiscal resources, and to do so upfront, at the point in time authorizing legislation is being drafted and choices between competing actions are being made. Cost estimates also feed into tabulations of aggregate surpluses and deficits, which in turn provide policymakers with a signal about the stance of fiscal policy. The question then, is what basis of upfront cost estimation and accounting for credit support puts it on a level playing field with other types of fiscal policies? This is sometimes

referred to as seeking “grant-equivalence,” whereby the reported cost of credit assistance can be interpreted as the size of a grant that would have the same fiscal cost to the government.

A fair value approach, which equates the estimated cost of credit support with its market value (or an estimate thereof when comparable and reliable market prices are not available), is our choice for achieving grant equivalence. An example that illustrates why a fair value approach achieves that goal is to note that the fair value of a loan guarantee is the price a financial institution would charge for providing an identical guarantee. Therefore, a government could offer grants to program participants to cover the price of loan guarantees purchased from banks, or it could buy the guarantees on behalf of the participants. The outlay would be the same in either case. Notice too that the price charged by a private sector guarantor would reflect the present value of the future uncertain cash flows associated with the guarantee. The discount rates that market participants would implicitly or explicitly assign to those cash flows would compensate for time value and also include a risk premium.

As the previous example foreshadows, operationalizing the idea of fair value cost in a budgetary context requires accounting for credit on an accrual (i.e., present value) rather than a cash basis. What distinguishes fair value accruals from alternative accrual approaches is that the discount rate reflects the risk of the cash flows--the discount rate is “risk-adjusted.” Risk-adjustment recognizes that taxpayers and other government stakeholders ultimately bear the associated credit risk and effectively are shareholders in risky government investments. Appendix II below outlines the specific approach we used for the subsidy cost estimates for the COVID-era direct loans and loan guarantees we evaluated. We have not attempted to estimate the fiscal cost of forbearance programs, although we discuss the costs qualitatively below.

In practice, most of the countries covered in this analysis as well as most countries that are not included do not record any upfront cost of credit programs in their budgets. Instead, they report credit assistance “below the line,” which means there is often no immediate budgetary impact from a new credit assistance program. Losses are only reflected when they eventually are realized. An exception is the United States, which reports credit subsidies on an accrual basis in the federal budget. However, those accruals are required by law to be calculated by discounting expected cash flows at government discount rates. That legal restriction causes the reported costs to be systematically lower than fair value estimates. The Congressional Budget Office has supported fair value cost estimates for credit, and often provides supplemental estimates for major credit programs on a fair value basis.

For the purpose of evaluating the macroeconomic effects of credit policy during COVID, we follow Lucas (2016) in treating fiscal cost as much less important than the incremental amounts of funds made available. The idea is that the expansionary effects of these policies during episodes of severe economic stress are primarily on the extensive margin of credit provision, rather than on the intensive one where the size of the subsidies are relevant. Fiscal costs are important for comparisons of the bang-for-the-buck of different policies, the amount of stimulus provided relative to its fiscal cost. We provide some rough comparisons across countries of bang-for-the-buck for the loan guarantee and direct lending programs.

3. Pandemic Credit Policies: Evaluation of Size and Fiscal Costs

In this section we seek to provide a quantitative answer to the deceptively simple question: How much incremental cash in aggregate did households and businesses obtain via credit support and forbearance programs in different countries in aggregate? As discussed in Section 2, the answer to this question is a necessary input for analyzing and comparing the broader macroeconomic effects of these policies in a way that is fairly parallel to analyses of the effects of traditional fiscal spending. For the major credit guarantee and direct lending programs, we also report estimates of their fiscal cost (taken from our previous work), which when compared to the incremental cash provided, provide bang-for-the-buck estimates for these programs.

In Section 3.3 we also briefly discuss the relaxation of regulatory requirements and other rule changes affecting banks that accommodated the large-scale usage of credit guarantee and forbearance policies. Notably, those policies may have contributed to overly optimistic perceptions about the health of the financial system and of household finances during this period.

We consider credit support in the form of loan guarantee and direct lending programs separately from the assistance provided by forbearance policies. The many differences between these policy types raise somewhat different conceptual issues, and necessitate applying different but related measurement approaches. Our estimates draw on, and extrapolate from, data obtained from a variety of sources including official reports and statistical sources, academic and policy papers, and our own recent work on some of these programs.

3.1 Credit guarantee and direct lending programs for firms

An intriguing database released by the IMF in 2021 provided an international comparison across countries of pandemic fiscal and credit policies. Specifically, it compared incremental traditional fiscal spending related to COVID with the program “envelope” for below-the-line (off-budget) measures. Traditional fiscal spending includes both health and non-health related items.⁵ The envelope of below-the-line measures include the amounts that were legally authorized for new credit support and equity purchase programs. We equate the envelope with new credit support policies because equity purchases comprise a small share of the totals.⁶ That data suggest the potential importance of credit policies during COVID. It reveals the wide variation across countries in the types of policies introduced, and the much less aggressive policy responses of emerging markets. The graphs summarizing the IMF findings are reproduced in Figure 3.1.1.

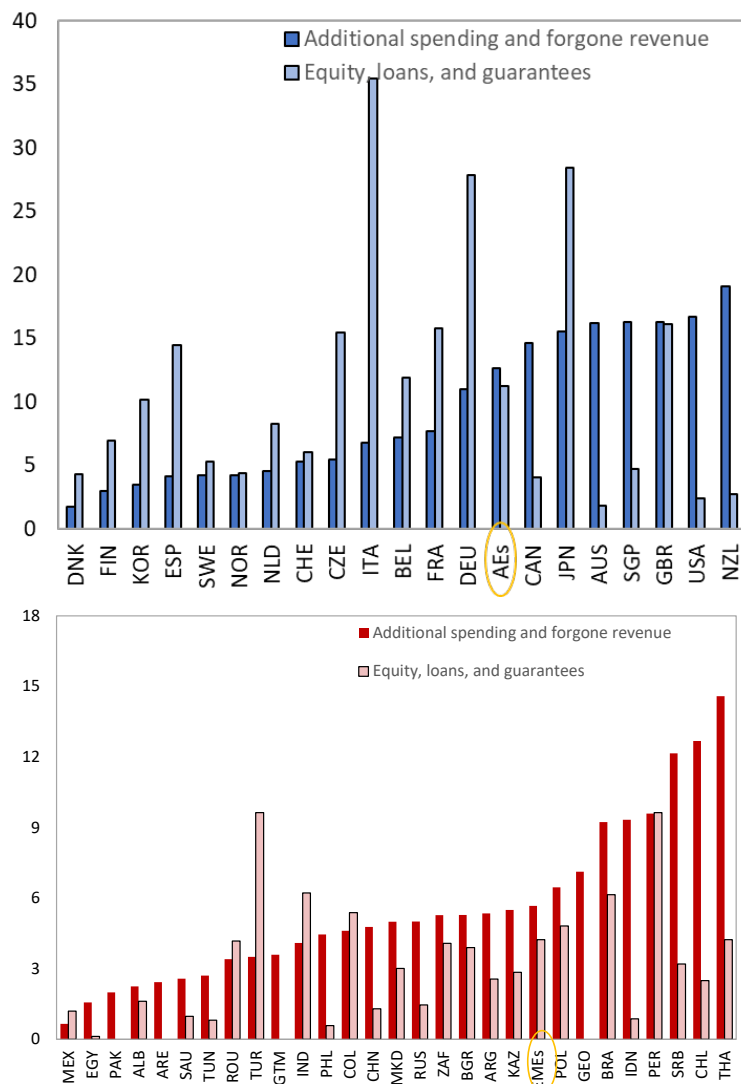
While the IMF data is suggestive of the potential importance of credit policies during this episode, the credit envelope has only an indirect connection to macroeconomic and fiscal outcomes. In most cases, the envelope is much larger than the amount of credit extended under the programs—the program “take-up.” Furthermore, the relation between take-up and envelope is a noisy one. The envelopes reported by the IMF also do not include any of the funds made available through the large-scale forbearance programs discussed in Section 3.

⁵ We find that the IMF’s measure of incremental spending is for some countries similar to, and overall, highly correlated with, the excess of fiscal expenditures in 2020 and 2021 over those in 2019.

⁶ The IMF categorizes all of the policies as fiscal, and breaks them into these two subcategories, ‘additional spending and forgone revenue’ and ‘equity, loans, and guarantees.’

Figure 3.1. Discretionary Fiscal Response to the COVID-19 Crisis in Selected Economies

(Percent of 2020 GDP)



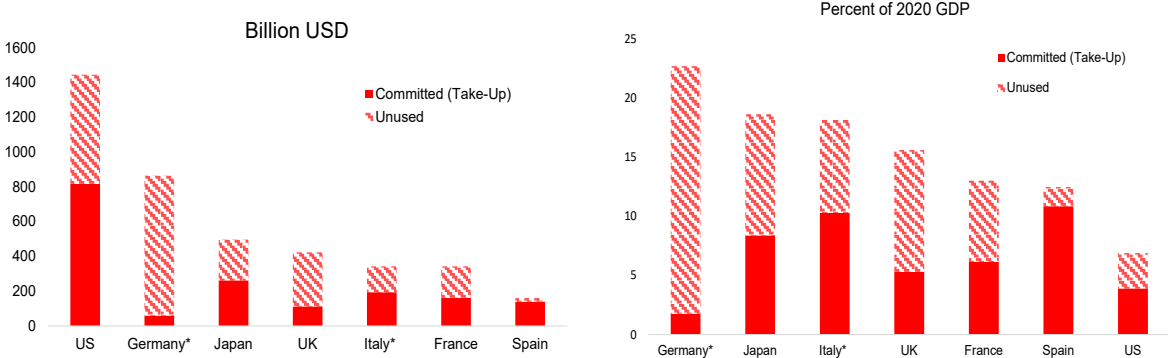
Note: The top panel plots the size of the announced fiscal support for a sample of advanced economies, and report the average highlighted as ‘AEs’ for advanced economies. The bottom panel presents a sample of emerging market economies, with the average value highlighted as ‘EMEs.’

To answer questions about how much money these credit programs made available to borrowers, the fiscal costs, and the stimulus provided, take-up is the more relevant starting point and the one we focus on here. The statistics reported on take-up and cost in this section are largely drawn from our recent paper, Hong and Lucas (2023). In that study, we provided estimates of take-up and fiscal cost on a fair value basis for the major credit support programs for firms that were implemented in seven countries, including the five largest economies in Europe (France, Germany, Spain, Italy, and the United Kingdom),

Japan, and the United States.⁷ Overall, these programs covered more than 90 percent of the credit support programs for firms that were introduced around the world during the pandemic according to the IMF. Most of these programs were launched following the lockdown orders in March 2020, in anticipation of a wave of firm defaults and a drop in income and liquidity.

Figure 3.1.1 compares the total program envelopes with realized take-up, both in dollar terms and as a share of 2020 GDP. In dollar terms, the US had the largest envelope of about \$1.4 trillion. When normalized by GDP, however, several other countries had larger envelopes. The total take-up of credit support by firms in the seven advanced economies we study exceeded \$1.7 trillion.⁸ Using a simple average across countries, the average take-up is about 6 percent of 2020 GDP.

Figure 3.1.1 Credit Support Programs during COVID-19: Committed vs. Unused Envelope



Source: Hong and Lucas (2023). Estimates are based on official sources for each country, IMF Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic, and Anderson et al. (2021).

Note 1/ The following programs are included in each country’s total envelope. Italy: “Cura Italia” guarantees and SACE Garanzia Italia.; UK: BBLs, CBILs, CLBILs and the Bank of England’s COVID corporate financing facility (CCFF); Spain: ICO loan guarantees, France: Prêt Garanti par l’État; Germany: KfW loans for small and large loans and a part of the increase in the economic stabilization fund (WSF) (400 billion euros) to provide additional state guarantees for firms; Japan: Safety Net No.4 and No.5; US: Paycheck Protection Program, Main Street Lending Program, Credit Support for Airlines and Critical Industries. Last observations were in January 2022, except for Japan (January 2021).

Note 2/ Some guarantee programs announced by Germany and Italy have uncapped legal limits to provide funds. The bars shown in the Figure show the cap on total guarantees provided by the government, rather than the actual injections to the guarantee funds.

The wide variation in observed take-up rates has a variety of possible explanations. Countries that experienced larger economic shocks from the pandemic may have had higher take-up rates, other things equal. At the same time, the attractiveness of program terms, bottlenecks in financial intermediaries in assessing loans, and the availability of non-credit support programs are at play (Anderson et al. 2021). In Spain, for instance, the greater recourse to guaranteed loans can be partly attributed to the lower

⁷ For program details for individual programs and countries, see the annex of Hong and Lucas (2023).

⁸ Most credit programs reported take-up through January 2022, except for Japan (January 2021).

availability of alternative fiscal relief measures for corporations (e.g., direct grants of State aid). This is consistent with the general pattern we find in Section 4 of what appears to be substitution between credit and non-credit assistance. In France, the higher take-up of guaranteed loans may reflect the favorable pricing offered to borrowers through grace periods and concessional rates, especially during the first year of the loan. In Germany, the relatively limited use of such loans may be due to: (i) lower financing needs of firms compared with other countries, owing to a less stringent lockdown and firms' greater use of a combination of other policy measures that supported corporate balance sheets, including direct grants and tax deferrals and short-time working allowances; (ii) less favorable lending terms (e.g., higher rates, a prohibition on distributing dividends and limits on the remuneration of managers); and (iii) some supply-side bottlenecks related to the risk assessment required for large loans. On the loan supply side, operational bottlenecks and an overwhelming number of loan applications may have impeded the take-up at the initial stage of the programs. Core and De Marco (2021) look at the different levels of information technology used to process online applications by banks in Italy and emphasize the role of information technology in processing high volumes of online applications and disbursements. Over time, the take-up in Italy continued to increase, notwithstanding the existence of a largescale debt moratorium scheme.

The terms of these credit programs varied along a variety of dimensions. To give a fairly typical example, consider the UK Coronavirus Business Interruption Loan Scheme (CBILS), a guarantee program directed at small and medium-sized businesses.⁹ It provided loans ranging from 50,000 GBP to 5 million GBP, with the available amounts depending on firm characteristics. Loan maturities ranged from 3 months to 6 years, and a variety of loan types were eligible to be guaranteed. Collateral was not required on most loans. The program provided an 80% guarantee, with 20% of losses absorbed by the private sector lenders. Lenders were charged an annual guarantee fee of 75 basis points. The government paid the first 12 months of interest and fees, up to a maximum of 800,000 GBP. Loan pricing was at the discretion of lenders, but lenders had to demonstrate that the net financial advantage of the guarantee was passed through to the borrower.¹⁰ The program wound up authorizing 98,000 loans totaling 23.3 billion GBP.

Structurally, there were common elements across most credit guarantee programs. First, a program specified the characteristics of target beneficiaries. In some programs, companies of all sizes were eligible (e.g., Germany KfW, France PGE), while in others, only companies of certain sizes could participate (e.g., UK CBILS vs. CLBILS). Second, program rules specify guarantee coverage, i.e., the share of losses absorbed by the government in the event of a default. In the programs that we assess, the guarantee coverage ranged from 70 percent to 100 percent.¹¹ Third, a program restricts other terms, such as how interest rate(s) are set, loan maturities and eligible loan types (e.g., term or asset-backed loans), and guarantee and other fees or premium. In some programs, interest rates were fixed by the government (e.g., UK BBLS), and in others, lenders were permitted to set the rate but with a cap (Spain), or subject to benefit pass-through (e.g., UK CBILS and France). For countries in the European Union,

⁹ Source: [HM Treasury coronavirus \(COVID-19\) business loan scheme statistics - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/hm-treasury-coronavirus-covid-19-business-loan-scheme-statistics)

¹⁰ Although such requirements might not have been strictly adhered to in all cases, the considerable regulatory oversight of the banking system and the adverse consequences of being found to have violated the rules provides incentives for compliance. Anecdotal evidence suggests such rules were taken seriously.

¹¹ The guarantees were typically *pari passu*, meaning that losses were shared proportionally between lenders and the government.

guarantee fees are prescribed in the EU temporary framework based on maturity and firm size.¹² Finally, loan sizes were typically limited in absolute amounts. For countries subject to the EU temporary framework, loan size was subject to a ceiling where the total amount should not exceed: (i) double the annual wage bill of the beneficiary for 2019 or for the last year available; or (ii) 25 percent of the beneficiary's total turnover in 2019. Exceptions could be made if there was appropriate justification and self-certification by the beneficiary of its liquidity needs. Several countries included additional provisions to allow loans to be more generous, such as a one- or two-year waiver of principal payments (pre-amortization). In some countries like the UK, interest payments were also paid by the government for one or more years.

To make the loans accessible more accessible to certain target borrowers, several countries introduced programs with 100% government guarantees and relatively generous terms. There were five programs of this type that are included in the statistics here: US Paycheck Protection Program, Germany KfW Instant Loan UK Bounce Back Loan Scheme, Japan Safety Net Guarantee No. 4 and 5, Italy Fondo di Garanzia. Compared to other programs under the same umbrella but with partial guarantees, these full-guarantee schemes had: (i) quicker disbursement and minimal credit risk assessment; (ii) longer loan maturities; and (iii) lower maximum loan amounts. In some programs, terms were liberalized over time with extensions of loan maturity, extensions of program end dates, or increases in the envelope. The reported take-up and envelope sizes reflect the most recent information on those totals.

3.1.1 Fiscal costs of credit support programs

We equate the fiscal cost of credit support programs to the fair value of the assistance granted, as estimated in Hong and Lucas (2023). The fair value estimates represent the net present value of projected cash flows to and from the government over the life of the underlying loans, approximately as of the point in time when the loans were originated (see Appendix 2 for a stylized example). Discount rates are inferred from quoted or observed market rates, adjusted using fair value principles for rate determination. Subsidy rates are defined as the ratio of fiscal cost to loan principal at origination. As discussed in Section 2.5, the aim is to produce cost estimates for credit support that are grant-equivalent, meaning that the cost to the government is equivalent to that of providing program beneficiaries with an upfront cash grant of the same amount.

The fiscal costs totaled \$330 billion (\$1.1 trillion including the U.S. PPP). That is relative to an estimated total take-up of \$873 billion (1.7 trillion including PPP). Dividing total fiscal cost by total take-up, the average subsidy rate is 37 percent (67 percent including PPP). The subsidy rate varies widely across programs as a function of program design choices such as the riskiness of target borrowers, the size of rate concessions, loan maturity, fees, and other program features.

In terms of cost-efficiency or bang-for-the-buck, a subsidy rate of 37 percent represents significant savings over the 100 percent subsidy associated with traditional fiscal spending. Whether a particular credit program is truly more cost effective than a fiscal action aimed at the same outcome will of course depend on additional factors such as whether the targeted recipients are the ones to take advantage of

¹² Under the EU temporary framework, guarantee fees (premiums) range from 25 basis points to 200 basis points, increasing progressively in line with the duration of the guaranteed loan and firm size.

the credit program and whether the funds are put to their intended uses, and whether the multipliers translating take-up to ultimate spending growth are in fact similar to the multipliers on fiscal spending.

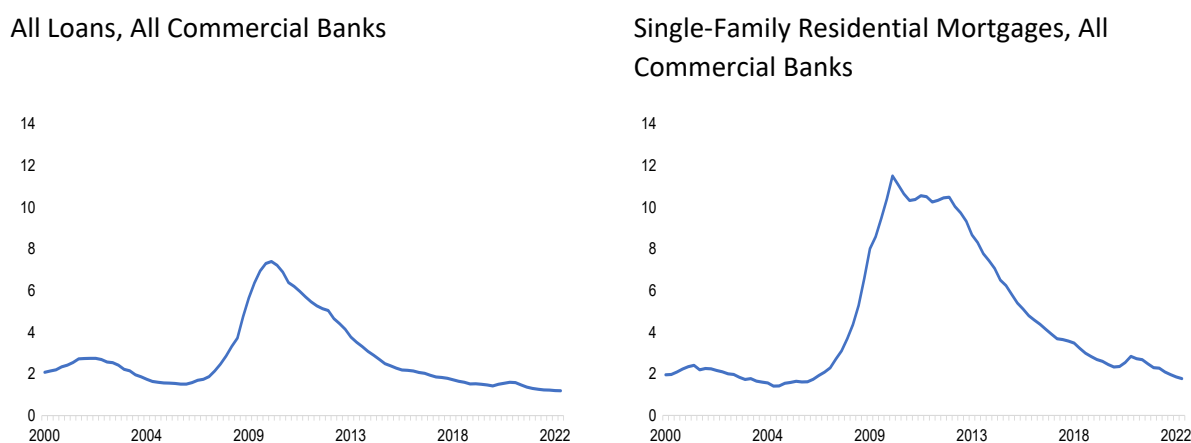
3.2 Forbearance policies

Many countries adopted debt moratoria and other types of payment holidays on debt (referred collectively to here as forbearance policies) that allowed millions of households and businesses to postpone payments on existing financial obligations for periods ranging from a few months to several years. Most forbearance policies were initiated in spring of 2020 and ended later that year or in 2021. For households internationally, the largest source of payment relief came from mortgage forbearance, with rent, auto loan, and student loan payment stoppages also providing significant assistance in some countries. Forbearance measures for non-financial corporations (NFCs) typically were aimed at SMEs with bank loans.

Programs offering rent relief were not included in our tabulations of forbearance. For rental relief that was funded by a national government, the expenditure should be included in the measure of incremental fiscal spending. For moratoria imposed on landlords as a mandate without compensation, funding was effectively via an un-booked tax that wouldn't be captured in any of the data that we have. To the extent that the increased propensity to spend by renters is offset by a reduced propensity by landlords, the omission of those programs should not distort inferences about macroeconomic effects. However, if renters have a higher MPC than landlords, omitting such mandates understates the stimulus effects of government policies.

The goal of forbearance policies was to avoid defaults by the many households and businesses that experienced sharp drops in income that were expected to be temporary. Avoided defaults prevented costly disruptions to lives and businesses. It stopped people from losing their homes; helped firms to remain as going concerns and retain employees; and shored up banks' regulatory capital. As others have noted, the extensive use of forbearance is one explanation for the historically low default rates that have continued through the present day. For example, Figure 3.2.1 illustrates the historically low default rates in the U.S. during the pandemic and in its aftermath. Forbearance policies also carry costs and risks. To highlight a few of them, there is the potential to leave households with unaffordable levels of future debt, and to create zombie firms whose eventual insolvency is more costly and potentially more destabilizing than had they been promptly liquidated (see also Section 2.4). To the extent the loans are treated as performing, the health of the financial system appears better than it is.

Figure 3.2.1 Default Rates on US Loans and Mortgages (percent, seasonally adjusted)



Source: FRED Economic Data, St. Louis Fed

Forbearance policies--particularly those that were made widely available such as the moratorium on U.S. student loan payments--also allowed many non-distressed borrowers that could have serviced their loans to stop making payments. The excess funds were then available to save or spend. For example, Albuquerque and Varadi (2022) present evidence for the UK that the mortgage holiday increased consumption among poorer households and savings among wealthier ones. Importantly, because most missed payments would not come due for several years, the effects of forbearance on savings and aggregate demand could extend well beyond the date that programs officially ended.

In the analysis here, we do not try to identify distressed versus non-distressed recipients of forbearance assistance or its target efficiency. Rather, the more modest goal is to estimate the total amount of incremental funds provided by missed payments under these programs in different countries and regions. The estimates are new to this paper and we haven't found other studies that try to estimate these quantities. Later in section 3 we add those missed payments to the funds obtained through take-up of credit support programs and from traditional fiscal policies to provide a comprehensive measure of incremental funds going to households and businesses through all major types of government policies during the pandemic.

The results of our investigation into incremental resources provided by large-scale credit forbearance programs, as measured by estimates of total missed loan payments due to forbearance policies, are summarized in Table 3.2.1. There are several important caveats. The first is that it is possible that there were significant forbearance policies that are left out of these tabulations. A second is that the estimates rely on extrapolations and approximations rather than on direct observations of the volume of missed payments. A third is that there is no offset for any reduction in lender resources when the programs were mandates on the private sector. Nevertheless, they represent our best estimates and are used as inputs into the macroeconomic analysis of Section 4. Readers primarily interested in those results rather than the details of how these totals were arrived at can safely skip to that section.

Table 3.2.1 Total missed loan payments due to COVID forbearance policies

Country	Forbearance (USD billions)	Forbearance (% GDP)
DEU	3.5	0.1
ESP	46.3	3.6
FRA	63.2	2.4
ITA	38.7	2.1
JPN	0	0.0
UK	31.65	1.2
US	117	0.6

Source: Authors' estimates

3.2.1 Estimating the size of incremental resources from forbearance

Data on forbearance programs is (even) scarcer than for credit support programs. Ideally, banking regulators or government agencies would monitor government forbearance programs and keep track of the size and timing of missed payments and the characteristics of program beneficiaries. In addition, keeping track of longer run performance statistics would provide insights into the costs and benefits of such assistance that could inform future policy choices.

We have only been able to obtain limited data on COVID forbearance policies, and only for some of the larger programs. The difficulty of obtaining data is partly due to the variety of channels through which the programs came about. Some of the programs were authorized through legislation while others came about by administrative decree or were voluntarily instituted by private entities. Some programs that arose from local directives might not be included in national reports. Some programs mandated that lenders participate while others gave lenders more discretion. In many instances the programs were extended beyond their originally announced end date, and we are unsure about the ultimate end date or how strictly it was held to. Information about how the missed payments would be treated is also not readily available. For most programs we don't know whether, and at what rate, interest accrued on missed payments, or what the scheduled timing was for when missed payments would be recouped.

Despite these many uncertainties, our estimates suggest that forbearance is likely to have provided a significant amount of additional cash to households and firms in some countries. Although there was likely to be some offset caused by the reduced resources of lenders for whom some of the policies were an unfunded mandate, because banks were well-capitalized and liquidity was plentiful the offset is expected to be small. Quantifying the additional resources allows us to consider the aggregate effects of those policies, which to our knowledge have not been explored in previous analyses.

Our estimates of the total value of missed payments arising from a given policy rely on combining data from various reports and press releases with assumptions to fill in any missing information about borrower types, loan maturities, program duration, etc. For most major programs in developed countries, we have information on the principal value of loans that received relief and the types of eligible loans. We can estimate the payment reduction per dollar of principal per period (e.g., monthly)

based on typical loan maturity and interest rate by loan type. Multiplying by the reported principal value and the assumed duration of the program yields the total value of missed payments that we attribute to the program.

European Union

We primarily rely on information provided by the European Banking Association (EBA) in their 2020 report to estimate the aggregate reduction in loan payments for households and non-financial corporations in the 25 European countries the EBA covers. The headline statistic is that in total about EUR 871 billion of “EBA compliant” loans had been granted moratoria as of June 2020, with EUR 860 billion going to households and NFCs.¹³ In addition, EBA reports that other COVID-19-related relief measures such as non-compliant moratoria and contractual modifications or refinancing applied to an additional EUR 60 billion of loans.

The EBA data further breaks out the coverage of NFCs and households, with about EUR 495 billion of the loans subject to EBA-compliant moratoria going to NFCs and EUR 365 billion going to households. Overall, 16% of small and medium enterprise (SME) loans were granted moratoria, followed by 12% of commercial real estate (CRE) loans; and 7% of residential mortgage loans.

For our base case estimate of the total payment reductions by households, we assume that all loans are amortizing mortgages, with an original maturity of 24 year, an annual interest rate of 2%, and monthly payments. Under those assumptions, the monthly mortgage payment is EUR 437 per 100,000 of initial loan principal or 5.3% of principal annually. Because the loans are amortizing, the mortgage payment per dollar of outstanding principal also depends on the age of the loan. It increases to 6.3% of loan principal in 5 years and 8.2% in 10 years. Assuming that 25% of the loans are fairly new, 25% are 10 years old, and the rest are 5 years old implies an average payment as a percentage of principal of 6.5%. We further assume that no payments were made for 9 months. Taken together, this implies that households had an additional EUR 17.8 billion ($.065 \times 9/12 \times \text{EUR } 365 \text{ billion}$) of available funds due to these programs.

A similar calculation provides an estimate of the total payment reductions by NFCs. Business loans typically have a much shorter maturity than residential mortgages, ranging from less than a year to 10 years or more for some commercial real estate. In our base case estimate, we assume that all loans are amortizing, with an original average maturity of 4 years, an annual interest rate of 5%, and monthly payments. This implies a monthly payment of EUR 2,303 per 100,000 of initial loan principal or 27.6% of principal annually. Because of amortization, that increases to 52.6% of remaining loan principal in 2 years. We take the 52.6% as the typical payment as a percent of remaining principal. We again assume that the payment holiday lasts for 9 months. This implies that European NFCs had an additional EUR 195.3 billion ($.526 \times 9/12 \times \text{EUR } 495 \text{ billion}$) of available funds because of these programs.

Information provided on the largest individual country programs (Italy, France and Spain) allows those results to be broken out from the European totals. Lacking a breakdown of the share of household versus NFC principal for individual countries, we attribute the share of the total estimated payment reduction of EUR 213 billion based on a country’s share of total loans under moratoria. The calculations and conclusions for Italy, France, Spain and Germany are summarized in Table 3.2.2.

¹³ EBA-compliant loans satisfied certain criteria that gave banks regulatory relief (see section 2.x).

Table 3.2.2. Summary of Imputed Payment Reductions for Four European Countries

France	French banks reported EUR 255 billion of household and NFC loans under moratoria, comprising 7% of total loans for households and NFCs. The share of the European total is $255/860 = 29.7\%$, implying a payment reduction of $.297 \times 213 = \text{EUR } 63.2$ billion.
Spain	Spanish banks reported EUR 187 billion under moratoria, comprising 10% of total loans for households and NFCs. The share of the European total is $187/860 = 18.1\%$, implying a payment reduction of $.181 \times 213 = \text{EUR } 46.3$ billion.
Italy	Italian banks reported EUR 156 billion in loans under moratoria, comprising 13% of total loans for households and NFCs. The share of the European total is $255/860 = 29.7\%$, implying a payment reduction of $.297 \times 213 = \text{EUR } 38.7$ billion.
Germany	While EBA-compliant measures in Germany were less relevant than in other major EU countries, German banks reported the largest amount of loans with other types of COVID-19-related forbearance measures, totaling EUR 14 billion, or 1% of total loans. Applying the weighted average payment reduction between household and NFC loans calculated for the EU overall implies missed payments of EUR 3.5 billion (based on $.33 \times 9/12 \times \text{EUR } 14$ billion).
<i>Note:</i>	Estimates based on data and commentary in EBA (2020) and authors' calculations

Some smaller countries relied the most heavily on moratoria in percentage terms. The EBA notes that the country that had the largest share of bank loans covered by a moratorium was Cyprus at 50%, followed by Hungary and Portugal each at greater than 20%. The overall average of bank loans to households and NFCs were covered under moratoria was 7.5 percent.

Clearly there is considerable uncertainty surrounding these point estimates. The assumed maturity and interest rate on mortgages is loosely consistent with data reported by Statista for recent years for the larger European economies. To the extent that some mortgages had a shorter initial maturity than the assumed 24 years, or that other types of loans are included with shorter maturities, the estimates are downward biased. The sensitivity to the assumption about rates is reduced by the low and falling mortgage rate environment that has prevailed in Europe for the last decade. The largest source of uncertainty is how long forbearance was in force. According to EBA, 85% of the programs were scheduled to end by year-end 2020 but many were extended into 2021 and some of the arrangements could have continued for even longer. The total payment reduction is proportional to the length of the forbearance period assumed, making it easy to evaluate the sensitivity to this assumption. The estimates for NFCs have considerable uncertainty associated with the size of the payment relative to loan principal. This arises from not having data on what is likely a broad distribution of loan maturities.

United Kingdom. The UK instituted a payment holiday for residential mortgages in March 2020 that initially allowed a suspension of mortgage payments for up to 3 months without an effect on borrower credit scores. The policy was soon amended to allow six months of non-payment. According to Albuquerque and Varadi (2022), at the peak, in May 2020, around 17% of all mortgages were on a payment holiday. That proportion declined gradually over time, reaching about 2.5% in October 2020. There does not appear to have been largescale forbearance on business loans.

As for the EU and consistent with information on UK mortgages, the estimated payment reduction is based on an amortizing mortgage with a 24-year maturity bearing an interest rate of 2%, with monthly

payments. The resulting annual payment per unit of original principal after 5 years is 6.33% of loan principal. The average holiday was assumed to last for 4 months. Outstanding UK mortgage debt in 2020 totaled about GBP 1.5 trillion. The implied total payment reduction is GBP 31.65 billion.

United States

Under the CARES Act that was enacted on March 27, 2020, US mortgage borrowers could apply for forbearance on loans backed by the government via Fannie Mae, Freddie Mac, or FHA/VA/USDA, and forbearance could last for up to 18 months inclusive of any extensions. The CARES Act also placed a moratorium on federal student loan payments that is still in effect, and that forgives the missed interest payments. Other forbearance measures were instituted as well, but the amounts involved were much smaller.

Cherry and others (2021) report that between March 2020 and May 2021, more than 70 million consumers with loans worth \$2.3 trillion entered forbearance, missing \$86 billion of their payments.¹⁴ They break the total down into student loans (\$45 billion), mortgages (\$31 billion), auto debt (\$5.7 billion) and revolving debt (\$4.7 billion). We take \$86 billion as the cumulative total through May 2021.¹⁵

To extrapolate to the end of 2021 for mortgages, we refer to the more recent analysis of Sanchez and Wilkinson (2022) who report that 85% of these borrowers had mortgages in forbearance for a year or less. That suggests that less than 15% of the mortgages accounted for by Cherry and others (2021) were still outstanding between June and December 2021. We estimate that an additional \$1.6 billion of payments were missed during this time, based on assuming that 10% of the mortgages on average were still in the program and prorating it by the relative number of months covered ($\$31 \times .1 \times 7/14$)

We also need to estimate the additional value of foregone payments for student loans after May 2021, and do so in two ways. For symmetry with most other pandemic programs, we extrapolate only to December 2021.¹⁶ We employ a back-of-the-envelope calculation similar to what we did for mortgages. Student loans outstanding in 2021 stood at approximately \$1.5 trillion. About half of loans would have been in grace, deferral or forbearance even during ordinary times in the past, and the increase in income-based-repayment in recent years means that many payments are reduced relative to the originally scheduled amounts. To capture this, we assume that only 1/3 of the loans would have been in repayment absent the CARES Act. The average interest rate on federal student loans since 2006 has been 6%. The standard payment term is 10 years but that can be extended to 20 or 25 years and that happens frequently. Based on these observations, we assume that the typical student loan benefiting from the moratoria has been in repayment for 5 years and that the principal is originally amortized over 20 years at a 6% interest rate. That implies an annual payment equal to 8.6% of original principal and 10.1% of remaining loan principal after 5 years. The estimated total missed student loan payments from June 2021 to December 2021 is \$29.5 billion ($1.5 \text{ trillion}/3 \times .101 \times 7/12$). A simple extrapolation from

¹⁴ This period is considered to be 14 rather than 15 months in our calculations because the CARES Act became law at the end of March.

¹⁵ This includes some voluntary forbearance by lenders that shouldn't be included in measures of government support. We have not adjusted for that in this draft but will in the next version.

¹⁶ That choice excludes the substantial payment reductions that occurred in 2022 that could be relevant for some questions. We may revisit this in a subsequent draft.

estimates in Cherry and others (2021) serves as a point of comparison and suggests a somewhat smaller total of \$22.5 billion ($\$45 \times 7/14$) over that period.

Adding the estimated additional \$1.5 billion in missed mortgage payments and \$29.5 billion in missed student loan payments to the \$86 billion in foregone payments reported by Cherry et. al. (2021) implies total payment reductions of \$117 billion.

Japan

We have not found mention of any significant loan forbearance policies in Japan. A rental relief program was instituted where participants did not incur any obligation for repayment. There was also tax relief on mortgages. However, both of those policies fall into the fiscal category.

3.2.2 Assessing cost and cost incidence of forbearance policies

Having previously touched on the potential pros and cons of forbearance policies, here we turn to conceptually how to assess their fiscal and private costs and incidence. The answer in individual cases will depend critically on how the policy is structured. We consider three major categories of policies: (1) the government forbears on payments owed to itself (e.g., US student loans); (2) government replaces or provides insurance on payments to private lenders (e.g., the Italian debt moratoria); or (3) the government mandates forbearance by private lenders without compensating them. It is left for future research to apply these principles to quantify the fiscal and private sector costs of the many COVID19 forbearance policies.

3.2.2.1 Existing government-backed loans

When a government offers forbearance on its outstanding direct loans or on guaranteed loans that were originated in the past, the incremental fiscal cost of the policy is the difference between the net present value of the associated net government cash flows with and without the forbearance policy (see also Sections 2.4 and 3.1.1). Note that the increase in expected losses following the onset of the pandemic is a sunk cost for the government, and the correct reference point for what the fiscal cost would be without the policy.

A related and more subtle question, both for forbearance policies and for other credit programs, is whether the costs of these policies should be estimated using a static score that abstracts from the macroeconomic effects of the specific policy, or whether a dynamic score that takes in account its macroeconomic effects should be used. It is important to understand that with either a static or dynamic approach, cost estimates should take into account the totality of government actions (fiscal, monetary, regulatory) on the value of the subsidies. Note also that a fair value approach to cost estimation reflects forward-looking expectations about those effects via the market's consensus about the value of risky claims. If government actions are salutary and cause periods of financial stress to be shorter and less severe, incorporating policy effects into projected outcomes will lower the estimated cost, and vice versa for policies that impede recovery. However, given the difficulties of predicting the size of the macroeconomic effects of specific credit programs, the two scoring approaches are expected to produce similar estimates.

In principle then, the government could institute a forbearance policy with no incremental fiscal cost by adjusting the rates or fees charged so as to preserve the net present value of future cash flows. A

forbearance policy even could have a negative fiscal cost if it caused a net reduction in costly defaults. In practice however, there are a number of reasons to expect the fiscal cost of such policies to be positive: It extends the period over which the original interest rate subsidies accrue; it increases outstanding loan amounts and thereby the size of potential defaults; it delays recoveries which all else equal reduces their present value; and the policy may be coupled with other costly concessions. A fiscally expensive example is the US moratorium on student loan payments. The program has been extended several times, and the interest component of missed payments is forgiven rather than accrued.

3.2.2.2 New government backing for private sector loans

The imposition of forbearance policies on private sector lenders and servicers creates costs for those entities that a government can choose to partially or fully absorb. The net present value of the incremental risk absorption by a government is the fiscal cost of the policy. For instance, a government could agree to provide a guarantee to lenders to cover default losses while the moratorium is in effect (e.g., because the borrowing firm goes out of business). The Italian program for bank loans had this feature. It is tricky to estimate the size and incidence of costs with this sort of arrangement. Forbearance tends to reduce near-term defaults but it increases defaults once payments resume. That timing shift makes it relatively inexpensive for the government to guarantee the loans during the forbearance period. That creates additional costs for lenders for the reasons mentioned above (higher balances that default, delayed recoveries, etc.). Those uncompensated costs are equivalent to imposing a tax on lenders, albeit one that is not included in official fiscal accounts.

3.2.2.3 Mandates on private sector lenders

It appears that lenders received no direct compensation or guarantees for the costs incurred under most mandated forbearance policies. They did receive regulatory relief as described below in section 3.3.

The resulting lender costs can be described as hidden taxes or in budgetary parlance as unfunded mandates. A drawback of uncompensated forbearance mandates is that the costs to lenders are hidden, hard to estimate ex ante, and potentially high. The fact that eventual losses will tend to be larger during longer and deeper downturns is one reason the costs to lenders may be higher than is generally recognized at the onset. Some might argue to the contrary that lender costs are like to be low or even negative because the policies tend to reduce total losses by providing time for households and businesses to recover. While that is true for voluntary forbearance, it is reasonable to presume that involuntary policies tend to have potentially significant costs to lenders.

Finally, while uncompensated forbearance costs are likely to be borne by lenders and their customers most of the time, in the event of a protracted downturn and elevated default rates, some of the costs would again land on governments through its support of financial institutions.

3.3 Regulatory accommodations

Missed loan payments typically have adverse consequences for both lenders and borrowers even when mutually agreed to. The bank has to report the loan as non-performing which affects its capital position, and the borrower's credit score takes a hit. Because of this, it was anticipated that many banks and borrowers would avoid forbearance programs without changes to these rules.

To encourage participation, certain rules and regulations were temporarily relaxed. For example, EBA (2020) notes that for EU banks, the application of qualifying moratoria did not automatically trigger either a forbearance classification or non-performing status of the exposure. They did caution banks to continue to monitor credit risk and to classify loans appropriately under IFRS standards.

By design, credit guarantee programs enabled some very risky firms to borrow that otherwise could not have done so. Despite an influx of risky borrowers via these programs, the effect of the large volume of guaranteed loans was to reduce banks' reported risk-weighted-assets (RWAs). EBA (2020) notes that EU banks reported average RWAs to be 18% of the exposure value for loans made under public guarantee schemes, whereas the average RWA was 54% for banks' loans to non-financial corporations (NFCs).

The reduction in risk weights was appropriate from a bank regulatory perspective because the guaranteed loans were in fact low-risk for the banks. However, a naïve reading of the low level of average RWAs could have given some policymakers the false impression that credit risk in the economy was much lower than it actually was.

In the US context, a feature of the student loan moratorium is that missed payments would not be reported to credit agencies and that delinquent loans would be given a fresh start. Haughwout and others (2020) reported this had the effect of increasing credit scores of student loan borrowers from 647 in March 2020 to 656 in June 2020, primarily initiated by the "curing" of delinquent loans as they entered forbearance.

4. Relation of credit policies to macroeconomic outcomes

In this section we combine the estimates of incremental cash provided by COVID credit policies with incremental fiscal spending for the seven large countries whose credit policies we have studied. We then examine how those policy choices are related to certain macroeconomic outcomes and their differentials across these countries. Specifically, we look at the relation between the incremental resources provided credit and fiscal policies, both separately and when added together, on GDP growth, savings increases, and inflation.

4.1 Combined size of credit, forbearance and fiscal policies

Estimates of the aggregate incremental resources provided by large, developed countries during the pandemic in the form of government credit support, forbearance, and fiscal policies are summarized in Table 4.1.1. Credit support is equated to the take-up (drawn principal amounts) of guaranteed and direct loans reported in section 3.1. Forbearance is equated to the total payment reductions reported in Section 3.2. Incremental fiscal support is based on the IMF estimates that are shown in Figure 3.1.

Table 4.1.1 Resources provided by credit, forbearance, and fiscal policies as percentage of 2020 GDP

Country	gov't credit	forbearance	COVID fiscal (IMF)		credit + forbearance	credit + forbearance + fiscal
DEU	1.5	0.1	15.1		1.6	16.7
ESP	10.9	3.6	8.4		14.5	22.9
FRA	6.9	2.4	9.6		9.3	18.9
ITA	10.2	2.0	10.8		12.2	23.1
JPN	5.2	0.0	16.7		5.2	22.0
UK	4.1	1.2	19.3		5.4	24.6
US*	3.9	0.6	21.5		4.5	25.9

*For the U.S. the Paycheck Protection Program is moved into the credit category and out of the fiscal category where it was recorded in government accounts. Moving it back to fiscal increases that category to 25.3% of GDP, and reduces the take-up of gov't credit to 0.08% of GDP.

A striking fact revealed by combining estimates of incremental credit and fiscal policies is the relatively small variation across countries in total incremental resources provided, ranging from 16.7% of 2020 GDP for Germany to 25.9% for the U.S., and averaging 22% overall. The coefficient of variation across countries for total incremental resources (credit + forbearance + fiscal) is .15, whereas it is .35 for fiscal spending, .56 for government credit support, and .93 for forbearance.

Also notable is that when credit support and forbearance policies are added to incremental fiscal expenditures, the U.S. is no longer an outlier from the rest of the pack. When only fiscal policy is considered, and when the Paycheck Protection Program is treated as fiscal, the U.S. has the highest ratio of fiscal expenditures to GDP, exceeding the second place UK by 6 percentage points of GDP. This suggests that narratives emphasizing the role of aggressive U.S. policy in fueling domestic and international inflation may exaggerate the disproportionate effect of U.S. fiscal actions.

It appears then that these countries used credit and fiscal policies as substitutes. This observation raises a number of important questions. Why did certain countries, in particular Spain, France and Italy, rely so much less on traditional fiscal measures? Was credit more attractive due to more binding constraints on government spending and the lack of transparency about the cost of credit policies? Or was credit support perceived as truly more cost-effective or efficacious? Did the countries that relied more heavily on credit policies get the same growth benefits as those that relied more on traditional fiscal measures?

While we won't speculate further about the various motivations for countries adopting different policy mixes, in the next section we consider how those choices correlated with differential, economic growth, savings rates, and inflation.

4.2 Do credit policies help explain macroeconomic outcomes?

To explore whether taking credit support and forbearance into account helps to explain macroeconomic outcomes, we consider the relation between the differentials in macro-economic country outcomes and alternative measures of the size of government policy interventions. Table 4.2 reports real GDP growth, the gross increase in private savings, and inflation by country. For the different variables, the time horizon is chosen as follows: Real GDP growth is measured from the 4th quarter of 2020 to the 4th

quarter of 2021, a period where pandemic lockdowns were in effect in many countries. Inflation is measured as the ratio of the CPI in October 2022 to the CPI in October 2021, the period when inflation accelerated. Increased savings is measured as the difference between gross private saving in 2020 and in 2019, divided by 2020 GDP. The reported results are fairly insensitive to modest shifts in the period start date.

Table 4.2 Real GDP growth and inflation rates

Country	inflation	real GDP growth	Increased Private saving
DEU	0.115	0.012	0.195
ESP	0.073	0.067	0.201
FRA	0.071	0.052	0.109
ITA	0.125	0.065	0.352
JPN	0.038	0.006	0.173
UK	0.111	0.088	0.544
USA	0.078	0.057	0.332

Source: IMF, World Economic Outlook Database

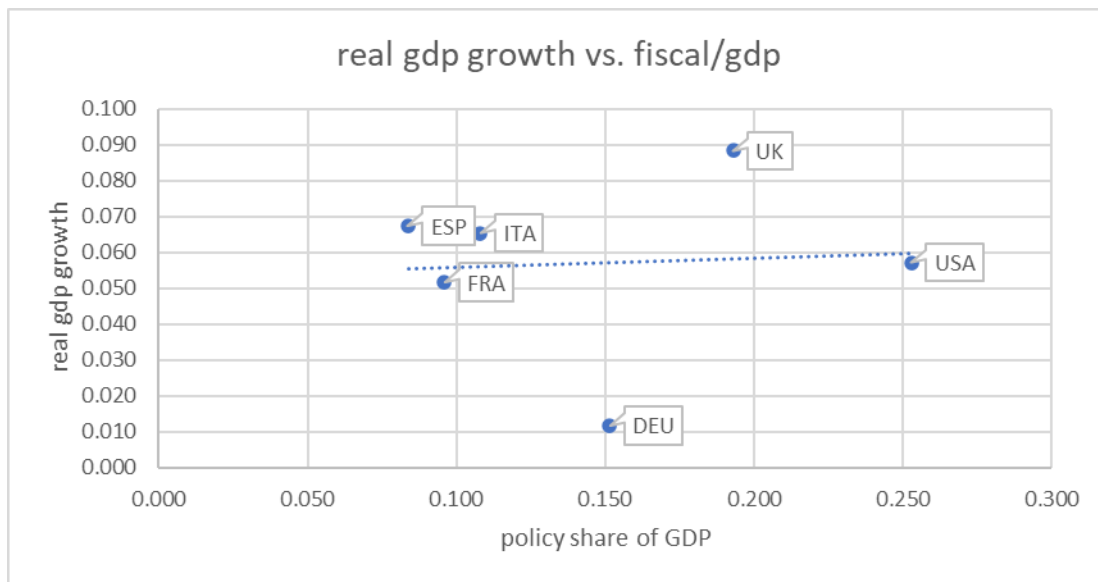
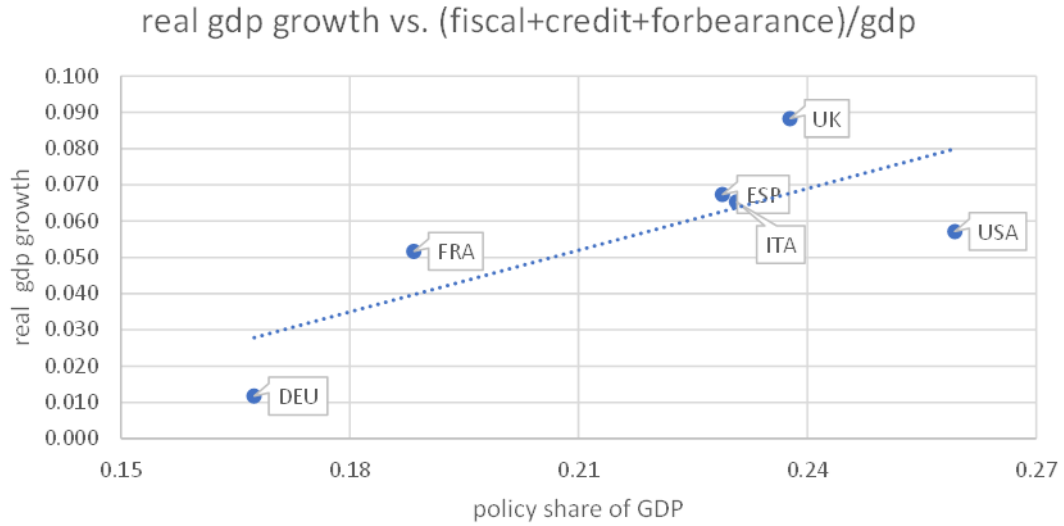
Notes: Inflation is the change in CPI between October 2021 and October 2022. Real GDP growth is cumulative growth of quarterly compounded rates through Q42021 divided by cumulative growth of quarterly compounded rates through Q42020. Increased saving is the difference between gross private saving in 2020 and in 2019, divided by 2020 GDP.

4.2.1 Real GDP Growth

The cross-country relation between real GDP growth and the different measures of policy can be summarized by the correlations between them.¹⁷ The correlation between real GDP growth and the sum of the three policy types is .62 whereas it is .35 for the sum of credit and fiscal policy, and -.07 for fiscal policy alone. The unintuitive negative sign for fiscal policy appears to be driven by Japan being an outlier with its very low growth and aggressive fiscal policy. When the correlations are recalculated excluding Japan, the correlation of real GDP and the sum of the three policy types increases to .79 whereas for credit plus fiscal it is .61 and for fiscal alone it is .07. Figure 4.1 illustrates the much stronger relation between cross-sectional real growth and a broad measure of resources made available versus the much weaker relation with differences in traditional fiscal spending.

¹⁷ We report correlations because with only a few countries and one historical episode, there is insufficient data to undertake a more formal statistical analysis. There are not enough degrees of freedom for even a simple multivariate analysis.

Figure 4.1 Real GDP growth versus alternative policy measures

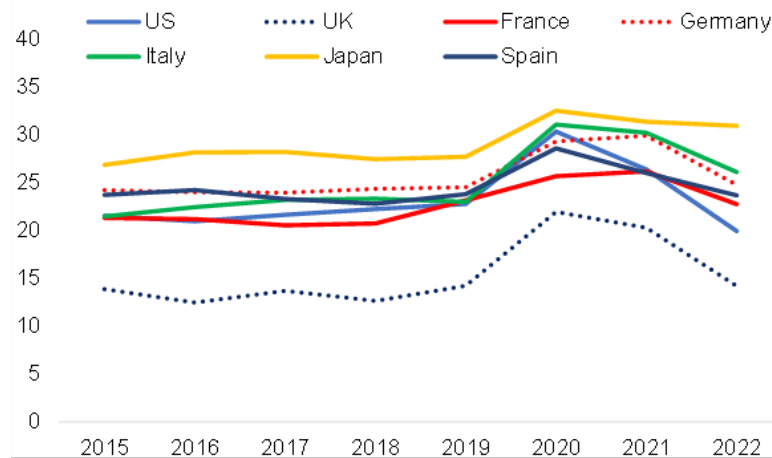


Notes: Real GDP growth is cumulative growth of quarterly compounded rates through Q42021 divided by cumulative growth of quarterly compounded rates through Q42020. Fiscal is incremental spending for COVID as reported by the IMF. Credit is take-up in COVID guaranteed and direct lending programs. Forbearance is foregone payments in those programs. All are normalized by 2020 GDP.

4.2.2 Growth in private saving rates

It is well-known that savings rates by both firms and households increased sharply during the pandemic. Explanations for elevated savings rates include the reduced activities that money could be spent on, an increased precautionary demand for savings, and the outpouring of funds made available through government spending and credit policies that are the focus here. Figure 4.2 shows the significant increase in gross private savings that occurred between 2019 and 2020. In most countries savings rates remained elevated in 2021 as well, and only recently have they returned to pre-pandemic rates in most countries. The results reported below on the relation between savings and different policy measures don't qualitatively change when the saving increase is measured as the average of 2020 and 2021 savings relative to 2019.

Figure 4.2

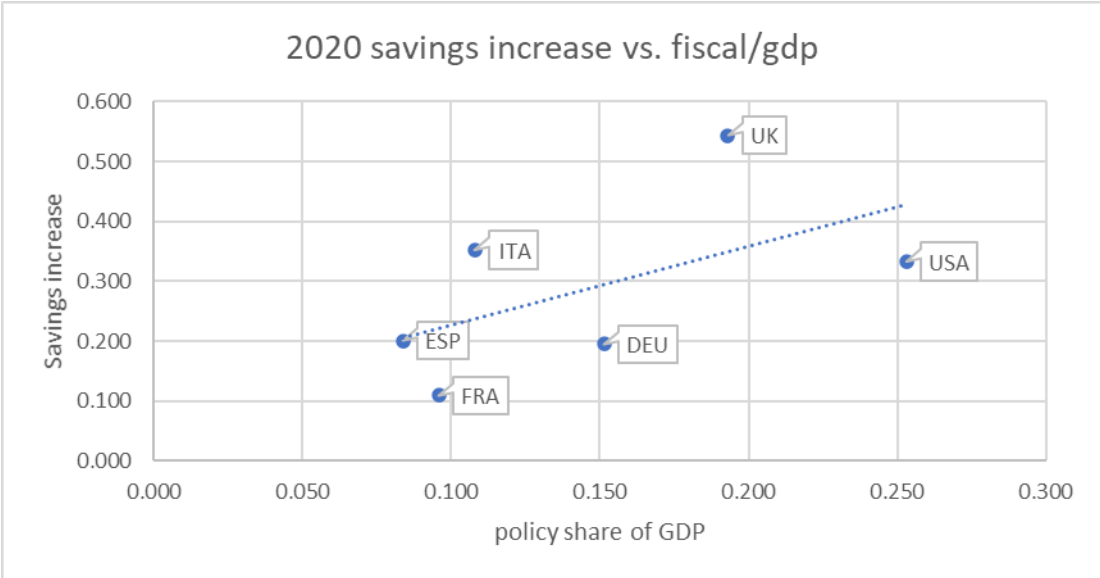
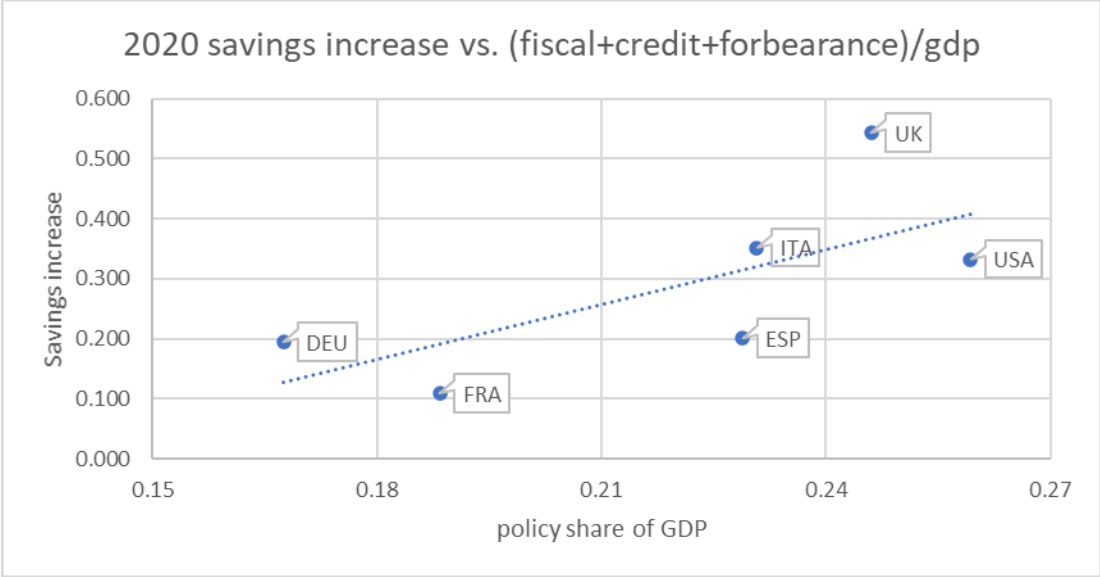


Source: IMF, World Economic Outlook Database.

As for real GDP growth, we consider the correlation between the different measures of policy and increased saving. The correlations are based on the values in Tables 4.1 and 4.2. The correlation with the sum of the three policy types is .67, whereas it is .69 for the sum of credit and fiscal policy, and .54 for fiscal policy alone. The correlation with forbearance policy alone is -.12. Excluding Japan, the correlation with the sum of the three policy types increases to .69 whereas for credit plus fiscal it is .79 and for fiscal alone it is .63.

The correlations between savings and policy actions are high. Adding take-up of credit support programs increases the correlation, but adding missed payments from forbearance decreases it. A possible explanation for the negative correlation with forbearance is that the more aggressive forbearance policies were a reaction to more elevated spending needs, and in fact those policies were relatively efficient at getting funds to businesses and households that needed to spend the money. The high correlation with take-up of credit and traditional fiscal policy supports the conjecture that the multipliers on both types of policies were probably lower than in previous recessions.

Figure 4.3 Savings increase in 2020 versus alternative policy measures

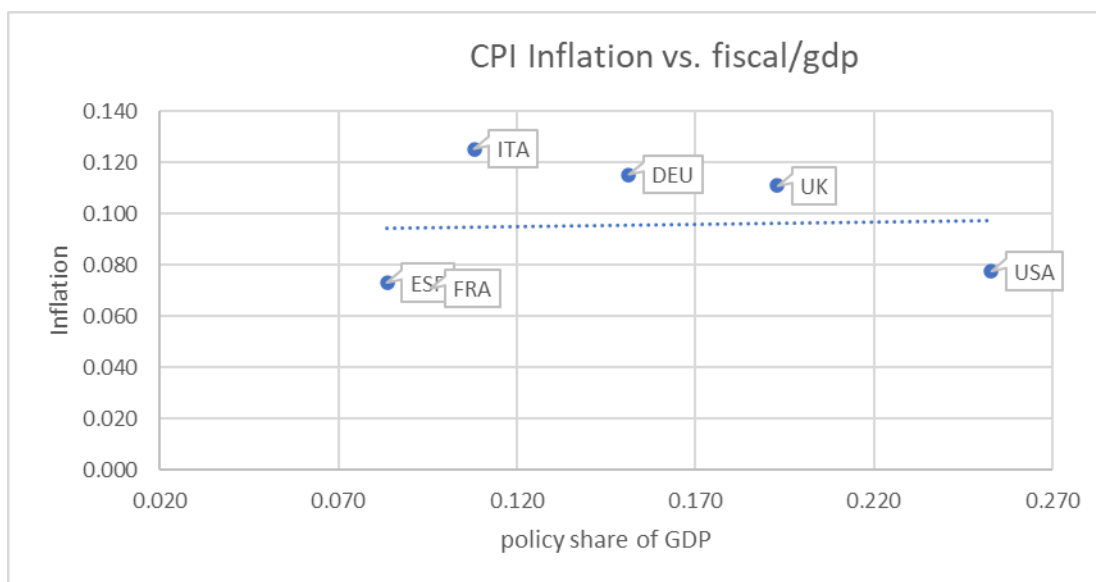
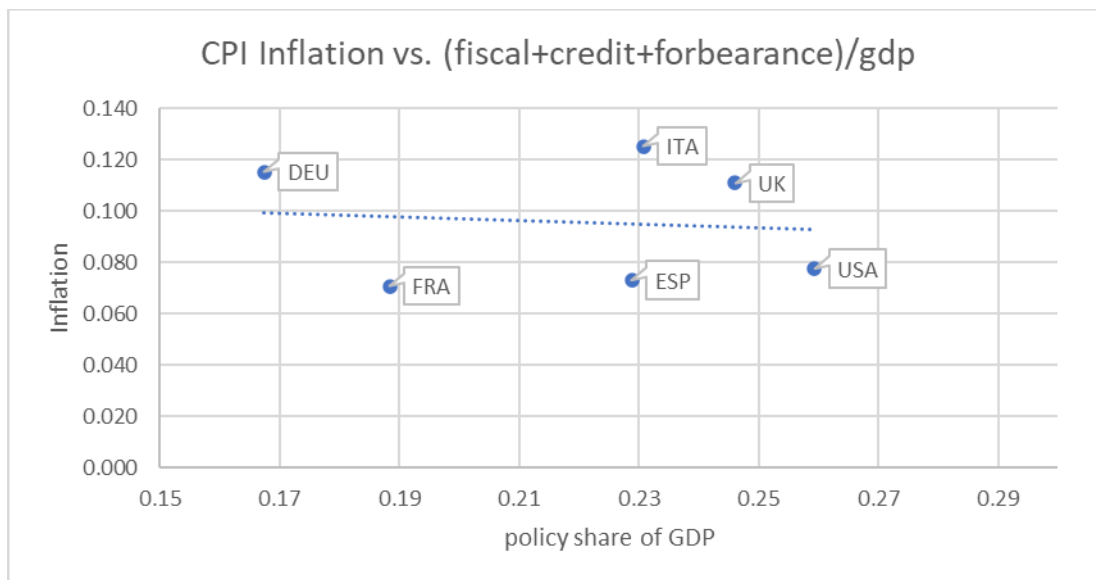


Notes: Increased saving is the difference between gross private saving in 2020 and in 2019, divided by 2020 GDP. Fiscal is incremental spending for COVID as reported by the IMF. Credit is take-up in COVID guaranteed and direct lending programs. Forbearance is foregone payments in those programs. All are normalized by 2020 GDP.

4.2.3 Inflation

The correlation between inflation differentials across countries and any of our policy measures is much weaker than for real GDP growth or for savings rates. It is also lower when credit support and forbearance are included (-.1) than for fiscal policy alone (.17). Japan is excluded in these calculations because Japan's very low inflation juxtaposed with its high fiscal spending causes the correlation between inflation and any of the policy measures to turn sharply negative. A possible reason for inflation differential between these countries to be small is that four of them share a common monetary authority. Figure 4.4 illustrates the relation between inflation and the different policy measures.

Figure 4.4 Inflation versus alternative policy measures



Notes: Inflation is the change in CPI between October 2021 and October 2022. Fiscal is incremental spending for COVID as reported by the IMF. Credit is take-up in COVID guaranteed and direct lending programs. Forbearance is foregone payments in those programs. All are normalized by 2020 GDP.

Despite the finding that the take-up rate of credit support and forbearance does not by itself help to explain the cross-section of inflation rates across these countries, consideration of the additional resources made available may strengthen the case for government policies having been an important factor in the elevated levels of inflation around the world. The combined measure of incremental government resources averages 22% of GDP across the seven countries, versus an average of 14.5% for

fiscal policy alone. To the extent that credit and forbearance policies contributed to higher savings rates, they could also have caused inflation to continue for longer as those higher levels of savings are gradually run down. The correlation between savings and real GDP growth, and between savings and inflation, are high. The correlations are .65 and .51 respectively when Japan is excluded, and .67 and .56 with Japan. A speculative interpretation is that countries that recovered more rapidly would up saving more of the incremental resources provided by government policies, and that as those higher savings levels are being spent down, they are contributing to higher inflation.

5. Concluding remarks

We began by noting the unprecedented number and scale of new credit support and forbearance policies introduced in response to the economic upheaval caused by the COVID pandemic, but also that the effective size of these policies and their macroeconomic effects have not been quantified. The main goal of this project was to begin to fill those gaps in two ways. The first was by developing and implementing procedures to size the different programs in ways that are meaningful for macroeconomic analysis. The second was to use those statistics to look for evidence about whether in fact these policies had quantitatively significant economic effects during the pandemic.

We find that the amount of funds injected into the economy via credit support and forbearance policies was significant: Incremental traditional fiscal spending averaged 14.5 percent of GDP across countries, whereas the combined effect of these policies and incremental traditional fiscal spending averaged 22 percent. Furthermore, there was much more uniformity across countries in the combined GDP share of policies than in their individual components. Taking into account the combined size of credit and fiscal policies also appears to better explain cross-country differences in real GDP growth and saving rates than does fiscal policy alone, with the caveat that any inferences are only suggestive because of the small sample size.

The quantitative analysis is restricted to large advanced economies because of the very limited availability of information on credit support and forbearance programs for most countries. However, the countries included accounted for 45% of global GDP in 2020 and an even larger share of global government fiscal and credit market interventions, suggesting that the policies studied here were of quantitative significance globally. We hope that future researchers will undertake similar analyses for additional countries.

The conceptual discussions regarding the measurement of fiscal costs and stimulus effects, the transmission channels through which credit policies operate, and of the pros and cons of fiscal versus different types of credit policies, pertain to EMDEs as well as to advanced economies. However, some of the negative aspects of credit policies that we alluded to but did not emphasize may be particularly salient for EMDEs. That includes their lack of transparency in government accounting for credit, and the hidden fiscal risks that are like to materialize when the economy is weak and fiscal resources are scarce. EMDEs may have more severe transparency problems, less ability to evaluate the risks, and are likely to have less capacity than advanced economies to manage such shocks when they materialize.

Economists generally do not give credit policy the standalone status accorded to monetary and fiscal policies. An unfortunate side effect of that omission is that the costs and other information about credit policies are poorly and inconsistently measured and reported on in official statistics, and sometimes

omitted altogether.¹⁸ There is also less of a common understanding of the ways in which credit policies, as distinct from conventional monetary and fiscal policies, affect macroeconomic and future fiscal outcomes. As we have emphasized in this paper, all of this obscures the effects arising from the totality of credit policies, including the significant fiscal costs and risks they entail. This paper, we hope, is a start at demonstrating the feasibility and the benefits of taking a more holistic approach to credit policies.

¹⁸ These issues are discussed in more detail in Hong and Lucas (2023) and references therein.

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Appendix I. Data Coverage

This appendix provides the list of credit programs and forbearance programs considered in the paper and the data sources.

For credit guarantee programs, we focus on thirteen credit programs introduced in the five largest economies in Europe (France, Germany, Spain, Italy, and the United Kingdom), Japan, and the U.S (See Table 1.1.1 for the full list). Overall, these programs cover more than 90 percent of the direct loan and loan guarantee programs for firms that were introduced in the world during the pandemic.

We compile program data from a variety of sources. The main source of information is from official reports, which are available with varying amounts of detail on the websites of the relevant ministries, central banks, or public financial institutions that oversaw the programs. Some programs released loan term sheets, and some program parameters were found in the text of authorizing legislation. Information collected from official sources is complemented by the IMF's "Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic."¹⁹ In some cases, discussions with IMF's country teams and with country authorities provided additional information. We also rely on analyst and media reports; notably Anderson et al. (2021) provides valuable information regarding the European credit programs.

Table 1.1.1. List of Major Credit Programs by Country

Country	Scheme	Envelope (LCD)	Envelope (USD)	Borrower Types
US	US Paycheck Protection Program (PPP)	799 Billion USD	799 Billion USD	Small Enterprises
	Main Street Lending Program	600 Billion USD	600 Billion USD	SMEs
	Credit Support for Airlines and Critical Industries	46 Billion USD	46 Billion USD	Airlines and Critical Industries
Japan	Safety Nets for Financing Guarantees No.4 and No. 5, Special Interest Program (実質無利子・無担保融資等)	53 Trillion Yen	496 Billion USD	SMEs
Germany	KfW Instant Loans	357 Billion euro	407 Billion USD	SMEs
	KfW Entrepreneur loans			Firms older than 5 years
	KfW Direct Participation Syndicated Loans*			Medium-sized and large firms
	KfW ERP Start-up Loan			Firms younger than 5 years
	WSF*	400 Billion euro	457 Billion USD	Large firms
UK	Coronavirus Business Interruption Loan Scheme (CBILS)	330 Billion pound	424 Billion USD	SMEs
	Coronavirus Large Business Interruption Loan Scheme (CLBILS)*			Large firms
	Bounce-Back Loan Scheme (BBL)			SMEs
	Covid Corporate Financing Facility (CCFF)*			Large investment grade firms
France	PGE	300 Billion euro	342 Billion USD	All firms affected by COVID-19
Italy	Fondo Centrale di Garanzia PMI	>100 Billion euro		Self-Employed, SMEs
	Public Guarantee for Debt Moratorium*	No limit (155 Billion Euro maximum take-up in March 2020)		
	SACE Garanzia Italia	200 Billion Euro	228 Billion USD	Medium and large companies
Spain	ICO loan guarantees	140 Billion Euro	160 Billion USD	SMEs

¹⁹ <https://www.imf.org/en/Topics/imf-and-covid19/Fiscal-Policies-Database-in-Response-to-COVID-19>

Note: We exclude the programs with asterisks that did not provide information on loan terms. We also did not separately estimate the cost of the UK CCFF because of its small take-up and restrictive terms that limited risk.

For the forbearance programs in the EU, the calculations are based primarily on statistics reported in European Banking Association (2020) and information from various press accounts. For the US we used official statistics that were reported by the programs. For the UK we referred to Bank of England publications and Varadi and Albuquerque (2022). For the U.S. we referred to Cherry and others (2022) and official statistics from various agencies.

Appendix II. Description of the Calculating Subsidy Elements of Loan Guarantees and Direct Loans

This Appendix describes a stylized version of the framework we used to calculate the fiscal (or subsidy) cost of government credit programs on a fair-value basis. The example here is for a program that provides a 100% guarantee. The approach used for direct lending and partial guarantees is closely related, and is described in Hong and Lucas (2023).

A notable aspect of the approach we took is that we discounted *promised* cash flows with the estimated *interest rate that would be charged* to borrowers by banks for a similar loan without government backing, a quoted or promised rate.²⁰ In Hong and Lucas (2023), we show why this is conceptually the same as discounting expected cash-flows at a risk-adjusted discount rate, and emphasize that this approach avoids having to make assumptions about default rates, recoveries, and expected rates of return, all of which would be difficult to ascertain particularly during this period of heightened uncertainty.

The lifetime cost of a new loan or loan guarantee is reported as a subsidy rate: the present value of government costs per 100 (national currency) of loan principal. Multiplying the subsidy rate by the principal take-up in a program gives the total subsidy for that program. Subsidies in these programs accrued primarily to borrowers, but in some instances, there was also a subsidy to guaranteed lenders. For borrowers, the subsidy represents the upfront payment that a competitive private sector financial institution would charge the government to offer credit to the borrower on identical terms but without any government support. For guaranteed lenders, the subsidy is the excess of the present value of lender receipts (fees and loan payments) over the present value of normal lender costs incurred (for administration, funding, and risk).

Example: Subsidy Element of a Full Government Guarantee Loan

In general, cash flows to and from a government arise from principal disbursements and repayments, interest payments, guarantee payouts, guarantee and other fees, and administrative costs. Specifically, cash outflows for loan guarantees include guarantee and other payments to participating lenders, and internal administrative costs. Inflows for loan guarantees arise primarily from fees charged to borrowers or lenders. The size, timing and risk of cash flows differs considerably across programs, and depend on loan maturity, amortization schedule, interest rates and fees charged, borrow characteristics, collateralization, grace periods, whether the guarantee is full or partial, and other factors.

Consider a full or 100% guarantee program that offers credit to qualifying SMEs, assuming no lender subsidies or rate adjustments to cover administrative costs. For the sake of simplicity, assume that loans are for two years, and the annual interest rate charged to borrowers is fixed at 3% under the program rules. No interest or principal repayment is required for the first year, and full repayment of principal and interest comes due at the end of the second year.

²⁰ The most common alternative would be to discount expected cash flows at the expected return on a similar loan without government backing. Relying on promised cash flows and observed rates has a major practical advantage in that it avoids the need to estimate expected default rates, recovery rates and risk premiums. Estimating those quantities is particularly difficult during periods of unusual upheaval and uncertainty, when projections based on historical data may be poor predictors of future outcomes.

On a EUR 100,000 loan, the lender would be guaranteed EUR $100,000 \times (1.03)^2$ at the end of two years. The cash flows for borrowers, lenders, and the government are summarized in Table A2.1. The realized borrower payment at time 2, "pmt₂" is a random variable whose outcome will depend on whether there is a default, and if so, the amount recovered.

Table A2.1. Cash flows on 100% guaranteed loans

	t = 0	t = 2
Lender	-100,000	$100,000 \times (1.03)^2$
Borrower	100,000	-pmt ₂
Government	0	$pmt_2 - 100,000 \times (1.03)^2$

The government's time 2 cash flow is identical to the hypothetical case that it had made the risky loan of EUR 100,000 directly, and at the same time had issued a zero-coupon bond with a face value of EUR $100,000 \times (1.03)^2$. That hypothetical is useful because we know how to value each of those two transactions. Specifically, we can now calculate the net present value of cash flows at time 0 for each entity in Table 3.1. By construction, the borrower cash flows and hence the borrower subsidy is EUR 7,340 as above, which is the difference between the principal received and the present value of the borrower's promised time 2 payment.

The net present value for the lender or for the government will depend on whether or not the 3% is the market interest rate for government obligations. When 3% is the government borrowing rate, and therefore also approximately the rate at which the market would discount cash flows with a 100% government guarantee, then the net present value for the lender is: $-100,000 + [100,000 \times (1.03)^2 / (1.03)^2] = 0$. The lender has made a safe loan and earns the fair rate of return on it, and so has zero net profit. The net present value for the government is: $100,000 \times (1.03)^2 / (1.07)^2 - 100,000(1.03)^2 / (1.03)^2 = -7,340$, where $100,000 \times (1.03)^2 / (1.07)^2$ is the fair value of the promised borrower payment, pmt₂.

As a result, the government absorbs any default losses and is not fully compensated for doing that. Abstracting from any administrative costs, the borrower receives a subsidy and the lender breaks even.