Sovereign defaults and social expenditures on health and education

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Sovereign defaults and social expenditures on health and education

Abstract. This paper estimates the effect of sovereign default decisions on social expenditures on health and education between 1980 and 2009 in a panel of 38 developing and emerging markets by using the U.S. 10-year Treasury yield as a source of exogenous variation in sovereign default decisions. This paper is the first to employ an Instrumental Variable approach to estimate the effect of defaulting on social expenditures and finds that defaulting results in an increase in education expenditures in the following year. No significant relationship is found for health expenditures. This paper also takes the heterogeneity in sovereign debt crises into account by examining how debtor coerciveness affects social expenditures on education and health. Soft defaults seem to be associated with larger increases in education expenditures compared to hard defaults, but this result does not hold for health expenditures.

1 Introduction

Under international human rights law, states bear the responsibility to protect and promote basic human rights such as the right to health care and education of all people under their jurisdiction.[1] In order to protect and promote these rights, states need to have sufficient resources. According to the Office of the United Nations High Commissioner for Human Rights (2017) a government's budget is an essential means by which to assess a state's effort in realizing human rights. This close relationship between human rights and the government budget has increasingly been recognized by bodies of the United Nations, such as the special rapporteurs and the Committee on Economic, Social and Cultural Rights (UNHCHR, 2017). However, resources are often scarce in developing countries. Sovereign lending can enable these countries to meet their human rights obligations through increasing the government budget. However, at the same time the fulfillment of debt burdens can also undermine the realization of human rights (UN HR Council, 2009). High sovereign debt can be a serious drain on a country's scarce resources, constraining social expenditures and development. To illustrate this, Ecuador's sovereign debt in 2004 was equal to $16.9 billion and Ecuador spent $3.7 billion on debt servicing. This was more than six times the amount of social expenditures on health. The Philippines spent in 2006 over 32% of its annual budget in debt servicing, compared to 14% on education and only 1.3% on health (UN Human Rights Council, 2011).

[1] See for example Articles 12 and 13 of the International Covenant on Economic, Social and Cultural Rights.

When seeing such figures, it does not come as a surprise that many human rights lawyers, representatives of the UN Human Rights Council and debt-forgiveness campaigners believe that sovereign debt service payments by poor countries come at the cost of social expenditures that contribute to the realization of human rights of their population (UN Human Rights Council, 2012; Bantekas and Lumina, 2018). For example, at the World Social Forum (WFS) that was held in 2002 in Porto Alegre, WFS participants observed that external debt payments are absorbing substantial amounts of resources and poor developing countries should stop repaying their sovereign debt (Lora and Panizza, 2002). However, will defaulting on sovereign debt truly translate into higher social expenditures that contribute to the human rights situation in these countries, like many seem to believe?

This conflict between sovereign debt obligations, social expenditures and human rights is a recurring topic in the public debate (UN Human Rights Council, 2012; The Guardian, 2020; Jubilee Debt Campaign, 2021). The purpose of this paper is to provide a quantitative assessment of the relationship between sovereign defaults and social expenditures during a default episode. To assess this, government expenditures on health and education of a panel of 38 emerging and developing countries between 1980 and 2009 will be examined. According to Reinhart and Rogoff (2009), the 1980s and 1990s where the decades with the highest rate of sovereign defaults. Beers and Nadeau (2014) showed that between 2009 and 2011 only 0.1% of the world public debt was formally in default. The incidence of default after 2011 was also remarkably low compared to previous periods (Roos, 2016). These facts motivated the time period studied in this paper and in total 21 default episodes can be identified.

In order to quantitatively assess the effects of defaulting on social expenditures, this paper proceeds in two steps. First, the impact of a default decision as measured by S&P (i.e. a binary variable) on social expenditures on health and education as a share of GDP will be examined by using an instrumental variable approach. The U.S. 10-year Treasury yield is proposed as a valid instrument for sovereign default decisions of emerging countries. This proposal is based on the following premises. First, hikes in the 10-year Treasury yield are related to sovereign defaults through sudden stops in capital flows, suggesting that the instrument is relevant. Second, the U.S. interest rate is uncorrelated with government expenditures on health and education in emerging and developing countries. However, because the U.S. interest rate could nevertheless have a direct effect on GDP (the denominator), additional safeguards must be put in place to ensure that the exclusion restriction is satisfied. To illustrate this concern, higher U.S. interest rates can cause higher domestic interest rates in the case of a fixed exchange rate regime, which can

for example result in lower investments, causing downward pressure on GDP. In the case of a flexible exchange rate regime, an increase in U.S. interest rates will raise the rate of return on dollars, leading investors to shift their investments back to U.S. assets, resulting in falling exchange rates among the developing economies. This can cause capital outflows and a decrease in investments, resulting in downward pressure on GDP. To deal with these two non-default channels, three relevant control variables will be added to the analysis. First, to control for the downward pressure on GDP that is caused by investment changes triggered by rising domestic interest rates (in the case of fixed exchange rate regimes), the domestic investment spending growth is added as a control variable. Second, to control for the downward pressure on GDP that is caused by falling exchange rates among flexible exchange rate economies, net exports will be controlled for. Finally, pre-crisis GDP growth rates will also be controlled for to limit the influence of systematic movements in GDP on the default coefficient.

Second, this paper will also take the heterogeneity of debt crises into account when analyzing their impact on social expenditures by using a continuous default measure. This is inspired by Trebesch and Zabel (2017), who showed that it is crucial to account for the severity of defaults and not only for their occurrence when studying their consequences. Accounting for the heterogeneity of debt crises will determine whether besides the incidence of a default, the scope and severity of a default also matter for government expenditures, thereby providing an even more detailed assessment of the relationship between sovereign defaults and social expenditures. In order to differentiate between defaults, the coerciveness index from Enderlein et al. (2012) is used. This index categorizes a government's policy towards external creditors on a scale from 1 to 10, with 1 being very creditor friendly and 10 being very coercive. Defaults with an average debtor coerciveness larger than 3.4 are labeled as hard defaults and defaults with an average debtor coerciveness smaller than 3.4 are labeled as soft defaults. A multiplicative interaction model will then be used in which the default dummy, instrumented by the U.S. 10-year Treasury yield, is interacted with the coerciveness index. Country and time fixed effects are included to account for omitted variables bias, as well as a vector of controls commonly used in the literature on the costs of default is included (Sturzenegger, 2004). Countries might however be forced to default because its social expenditures were unsustainably high in the first place. To address this problem of reverse causality, not only lagged values of education and health expenditures will be included, but also a country's start-of-year credit rating and the change in the debt/GDP ratio over the past 5 years. The latter two will be indicative of structural problems in a government's finances. Despite these efforts, one cannot completely rule out that some unobserved, time-varying confounder drives the results. Therefore, the coefficients with regards to the coerciveness index should be interpreted as correlations, rather than claims for causal effects.

The results of this paper can be previewed as follows. It is found that defaulting, instrumented by the U.S. 10-year Treasury yield, is associated with an increase of 0.658 percentage points in education expenditures as a share of GDP in the following year and this result is significant at 5%. This finding reinforces the argument made by debt-forgiveness campaigners that defaulting enables emerging and developing countries to reallocate more resources to the domestic population, in the form of increased education expenditures. The instrument has a meaningful first stage and safeguards against the potential violations of the exclusion restriction have been put in place, resulting in the confidence that this instrument is valid. In addition, this paper finds that besides the incidence of a default, the scope and severity of a default also matter for education expenditures. A one-notch increase in the coerciveness index, which is reflective of debtor coerciveness, is associated with a -0.028 percentage points decline in social expenditures on education as a share of GDP. Hence, soft defaults are associated with the reallocation of more freed-up resources to the domestic population compared to hard defaults. Surprisingly, none of these findings hold for health expenditures. Neither the occurrence of a sovereign default nor debtor coerciveness have a significant effect on health expenditures. This implies that defaulting does not have the same consequences for all government expenditures; there are also categories of social expenditures that remain unaffected during a default. In this case, governments tend to only increase their education expenditures and not also their health expenditures.

Regarding the empirical literature, it is striking how little research has been devoted on examining how social expenditures are affected during a default episode when a country decides to stop repaying its debt, considering the international attention given to this topic. Only Lora and Olivera (2007) have examined the effects of total public debt on social expenditures. They found that higher debt ratios reduce social expenditures. They also investigated how a default decision affects social expenditures and they found that expenditures increase after a default. In their paper, Lora and Olivera suggest having found a causal effect. However, doubts can be raised with regards to their methodology, and specifically, their measure for social expenditures. The first contribution of this paper to the empirical literature is to verify whether their found relationship holds true when using a different methodological approach, namely an instrumental variable approach. This paper is the first to employ an instrumental variable approach to identify this relationship. In addition, there is no empirical work on the relationship between sovereign defaults and government expenditures that takes the heterogeneity of debt crises in account. Lora and Olivera used a binary debt crisis measure of default verses non-default by Standard & Poor's. Trebesch and Zabel (2017) however showed that accounting for debtor coerciveness is crucial when studying their

consequences for GDP. The second contribution of this paper to the empirical literature is to show that it is also important to account for the heterogeneity in debt crises when studying their consequences for government expenditures.

The paper is structured as follows. In Chapter 2, a review of the literature on the relationship between sovereign defaults and social expenditures will follow. Furthermore, the proposed instrument (the U.S. 10-year Treasury yield) to estimate the impact of sovereign default decisions on social expenditures on health and education as a share of GDP will be discussed in detail. In Chapter 3, the dataset used will be described. Chapter 4 presents the econometric strategy and Chapter 5 discusses the main results. Finally, in Chapter 6 the results are summarized and the conclusion will be drawn.

2 Theoretical framework

In this Chapter, first a review of the literature on the relationship between sovereign defaults and social expenditures will follow. Here, the paper by Lora and Olivera (2007) and the validity of their results will be discussed. In the second part of this Chapter, the proposed instrument (the U.S. 10-year Treasury yield) to estimate the impact of sovereign default decisions on social expenditures on health and education as a share of GDP will be discussed in detail. The theory behind this instrument will be discussed by using both illustrative examples and empirical evidence. The argument will be made that sudden stops in foreign capital flows are related to sovereign defaults. In turn, sudden stops have often been linked to changes in the stance of the monetary policy in the United States. Because hikes in the U.S. interest rate can be related to sovereign default decisions, the instrument is relevant. However, the exclusion restriction might not be satisfied because hikes in the U.S. interest rate can affect GDP directly. This Chapter concludes with a discussion on the exclusion restriction and how the U.S. 10-year Treasury yield can still be used as a source of exogenous variation in sovereign default decisions in order to estimate the impact of defaulting on social expenditures.

2.1 Literature review

So far, there is only one other paper that assesses the effect of sovereign defaults on social expenditures on health and education. Lora and Olivera (2007) examined whether: (i) social expenditures as a share of GDP rise or fall when public debt increases, (ii) this effect depends solely on changes in debt payments, or whether the stock of debt has an effect on its own (iii) education and health expenditures are affected in the same way, (iv) official or multilateral lending makes a difference and (v) defaults increase social expenditures. They find that higher debt ratios reduce social expenditures, but this effect comes mostly from the stock of debt and not from debt service payments. Increases in debt service payments only have a minor and non-significant effect on social expenditures. This implies that sovereign debt lowers social expenditures not so much because it raises the debt burden, but because it reduces the room for further indebtedness. Furthermore, both social expenditures on education and health are lowered when public debt increases, but proportional to the size of the expenditures, the impact is larger on education expenditures. Loans from official or multilateral organizations such as the IMF do not ameliorate the adverse consequences of debt on social expenditures. Finally, and most importantly for this paper, they find that social expenditures increase after a sovereign default. To come to these conclusions, they used a panel of 57 countries between 1985 and 2003.

A major downside of their methodology is however that they did not take into account that their dependent variable is measured as a share of GDP. There might have been systematic movements in the GDP levels of the countries in their dataset around the default episodes. If this is the case, their positive default coefficient might have been caused by a systematic downtrend in GDP around the default decision, and not because of the default decision. Lora and Olivera have not looked at GDP and social expenditures separately, therefore one can seriously doubt the validity of the found relationship between defaulting and social expenditures.

Furthermore, to measure a sovereign default, Lora and Olivera used a binary debt crisis measure of default verses non-default by Standard & Poor's. However, as mentioned before, Trebesch and Zabel (2017) showed that it is crucial to account for the severity of defaults and not only for their occurrence when studying their consequences. This is because prior to a default decision, governments often face a trade-off. A government can either choose to adopt a coercive policy towards external creditors, for example by stopping all debt service payments, or a government can choose a friendly policy towards external creditors, by continuing the debt service payments. The first policy, called a *hard default*, enables resources that were dedicated to debt servicing to be reallocated to the domestic population. With the second policy, called a *soft default*, less resources will be freed up for reallocation to the domestic population. Hence, a hard default could in theory increase governments' social expenditures more than a soft default. However, defaulting on sovereign debt does not only hold benefits. Coercive policies towards creditors can also lead to collateral damage to the domestic economy, for example due to a loss of access to international capital markets (Eaton & Gersovitz, 1981) or direct trade sanctions (Bulow & Rogoff, 1989). Trebesch and Zabel used the coerciveness index by Enderlein et al. (2015) to account for the severity of default episodes and found that hard defaults are associated with larger declines in GDP (up to 10%) during a default episode compared to soft defaults. This finding suggests that hard defaults indeed cause more collateral damage to the domestic economy through larger declines in GDP. This could in turn result in lower social expenditures compared to a soft default. These effects work in opposite directions and so far, no research has been devoted on determining which effect is dominant in the relationship between debtor coerciveness and social expenditures.

2.2 Instrument

2.2.1 Relationship between foreign capital outflows and defaults: Asian financial crisis

The past has shown that emerging and developing countries are often large scale receivers of foreign capital inflows. However, when these countries suddenly stop receiving such inflows and instead face investors' demands for the repayment of these loans, economic distress in emerging and developing countries inevitably followed (Cavallo & Fernandez-Arias, 2012). The abrupt capital flow reversals often lead to outright defaults on loans or a rescheduling of the debt payments. An illustrative example is the Asian Financial Crisis of 1997-1998. Many causes have been mentioned in the academic literature.[2] I will follow the diagnosis that Radelet and Sachs (1998b) made in their seminal paper *The East Asian Financial Crisis: Diagnosis, Remedies, Prospects* to argue that abrupt capital outflows are a contributing factor to the financial distress in East Asia between 1997 and 1998.

First, multiple aspects of the onset of the crisis are worth highlighting. Between 1990 and 1996, the five crisis economies in East Asia (Thailand, Indonesia, Korea, Malaysia and the Philippines) experienced large scale capital inflows. Furthermore, exchange rates were characterized by either very little variation (Thailand, Malaysia and the Philippines) or with predictable variation (Indonesia and Korea). This way, foreign capital inflows into these economies were encouraged, because the respective Central Bank absorbed the risks of movements in the exchange rates on behalf of the investors. The last aspect worth highlighting is that the ratios of short-term debt to foreign exchange reserves in Thailand, Korea and Indonesia exceeded 1 after 1994. This ratio is in itself does not spark a financial crisis, as long as foreign lenders are willing to roll-over their loans. However, it can be seen as a red flag: if something were to happen that causes foreign creditors to demand repayment of their loans, each creditor has an incentive to demand repayment quickly, since there are not enough foreign exchange reserves to repay all investors.

The abovementioned facts highlight that East Asian countries were large receivers of foreign capital inflows, becoming more dependent on credit than on equity. In addition, capital inflows were becoming more short term and increasingly denominated in foreign currencies. However, late 1996, property prices began to fall in Thailand. One of Thailand's biggest property developers, called Somprasong Land, was not able to service its debt payments on time. Many consider this default as the first event of the Asian financial crisis, which would spill over to one emerging economy after another over the following two years (Chui, Illes & Upper, 2018). The Thai property market deteriorated further and a few months

[2] For an overview of the different causes and respective empirical work, see Blaszkiewicz (2000).

later, the government promised to buy bad property debt from Thai financial companies, but eventually reneged on this promise. Radelet and Sachs (1998b) argue that from this moment on, foreign investors became skeptical of the Thai real estate market and the financial institutions in the country. Speculation that the foreign exchange reserves were dwindling and that the Thai government would have to float the Baht followed. Not much time later, one of the largest finance companies, Finance One, was at the brink of collapsing (Independent UK, 2002). The Thai government initially declared that it would neither allow Finance One to go under, nor float the Baht, but to no avail. By July 1997, the government had sharply reduced its liquid foreign exchange reserves and the Baht became floating. As a result, foreign capital fled from Thailand. However, not only Thailand was effected. Foreign investors also withdrew capital from other countries in the region, regardless of their economic fundamentals. This is because investors assumed that if Thailand was in trouble, the countries in the region would also be risky investments. According to estimates from the Institute for International Finance, net private inflows during the Asian financial crisis dropped from $93 billion to -$12.1 billion, a difference of $105 billion. Radelet and Sachs (1998b) argued that it is very difficult to attribute such large-scale reversals in such a short period of time to changes in the economic fundamentals of these countries. This is because investors assumed that if Thailand was in trouble, the countries in the region that were viewed by investors as having similar fundamentals would also be at risk.

On December 22nd, 1997, the sovereign debt of Thailand, Indonesia and Korea was downgraded by Moody's, placing them below investment grade (Moody's, 1997, Radelet Sachs, 1998a). The downgraded bond status of these countries affected the banking and corporate sectors as well, given that the highest rating that a bond can have is generally dictated by the country rating where the issuer is situated ("sovereign ceiling" doctrine). The downgrading had two major consequences: (i) because many commercial banks in these countries were rated as sub-investment grade, these banks could no longer issue internationally recognized letters of credit for domestic exporters and importers; (ii) because portfolio managers are often required by domestic law to only maintain investments in investment-grade securities, this sparked even more debt liquidations in these countries. As a result of the creditor panic, the abrupt capital flow reversals and the sovereign downgrades, Korea, Indonesia and Thailand were thrown into partial debt defaults. In Indonesia, the defaults were unilateral and in the case of Korea, the defaults were handled by an emergency halting of debt repayments and a rollover of the short-term debt into longer term instruments backed by Korean Government guarantees (Radelet Sachs, 1998a).

2.2.2 Relationship between foreign capital outflows and U.S. monetary policy: taper tantrum

In the twentieth century, there are numerous other examples of such international financial crisis involving emerging and developing market economies that were preceded by large scale foreign capital outflows. Examples are Mexico, Turkey and Venezuela in 1994 and Argentina in 1995 (Sachs, 1999; Musacchio, 2011; Öztürk Aras, 2011). These episodes share three features: they were preceded by abrupt reversals in foreign capital flows, they could be considered as unexpected and they often resulted in economic distress and financial crises in the debtor countries. Much research has been devoted on studying the determinants of capital flows. The focus of much of this research was whether the determinants of capital flows are internal "pull" factors or external "push" factors. Pull factors relate to domestic conditions that help attract foreign capital, while push factors are adverse conditions in developed countries that affect global investors' decisions to invest (Fernandez-Arias, 1996). The seminal papers on this subject are Calvo et al. (1993, 1996) and Fernandez-Arias (1996). These papers found that push factors are more important than pull factors in driving capital flows. Calvo et al. (1996) argue that the large-scale foreign capital inflows into emerging markets in the 1990s was initially attributed to domestic pull factors (such as sound policies and strong economic performance), but eventually it became clear that the phenomenon was widespread, affecting countries with very diverse economic fundamentals. This suggested that global factors were especially important in driving capital flows. One often-mentioned push factor is the monetary policy of the U.S., proxied by the U.S. interest rate.[3] When the Fed tightens U.S. monetary policy, the rising U.S. interest rates lower the attractiveness of investments in other currencies. This puts pressure on emerging markets' exchange rates and bond prices. The tightening of monetary policy in the U.S., proxied by rising interest rates, is therefore associated with increased debt burdens, foreign capital outflows (also known as "stops" in the push-pull literature) and a rise in the incidence of financial crises in emerging market economies (Hoek, Yoldas and Kamin, 2021). An illustrative example of this argument is the taper tantrum episode of 2013.

In May 2013, former U.S. Fed chairman Ben Bernanke suggested the possibility of the gradual reduction of future bond purchases by the Fed (also known as "tapering"). The Fed started with quantitative easing in 2008 and this had led to an unprecedented $3.4 trillion Federal Reserve's balance sheet (Mohapatra, Burns, Kida, Lim & Stocker, 2016). When Bernanke announced that the Fed would evaluate the possibility of a reversal of its unconventional monetary policies, this came as a big shock to investors' expectations. This statement about the possibility of tightening US monetary policy alone set off an increase

[3]Other important push factors in the literature are risk aversion and the growth differential between advanced economies and emerging economies (Ahmed Zlate, 2014).

in interest rates – an episode now known as the "taper tantrum". The 10-year Treasury yield increased from 1.94 percent on May 21st to 2.03 percent on May 22nd, one day later. Following a Federal Open Market Committee (FOMC) meeting in June where Bernanke elaborated on the tapering, the 10-year Treasury yield increased even more, reaching 2.98 percent in September (US Department of Treasury, 2013). The increased 10-year Treasury yield, reflective of the sudden shift in investors' expectations, triggered large scale foreign capital outflows and currency depreciation in several large developing and emerging-market countries (Sahay et al., 2014; Bems et al., 2020).

Much research has been devoted on examining the empirical relationship between global interest rates (often proxied by the U.S. interest rate) and foreign capital flows in emerging markets (Calvo et al. 1996; Fernandez-Arias, 1996; Taylor & Sarno, 1997; Byrne & Fiess, 2011; Bluedorn et al., 2013). The general conclusion from these studies is that an increase in the global interest rate tends to increase foreign capital outflows. On the other hand, Forbes and Warnock (2012) find in their influential paper no significant role for changes in global interest rates in affecting capital flows. This is in contrast with the earlier work on the empirical relationship between U.S. interest rates and sudden stops. However, Forbes and Warnock used the average rate on long-term government bonds in the United States, the Euro area and Japan as a measure for global interest rates. As a robustness test, they also looked at solely the U.S. interest rate, and then they did find significant effects of the U.S. interest rate on the occurrence of sudden stops.[4] Hence, empirical evidence suggests that the U.S. interest rate, reflective of the monetary policy in the United States, is correlated with foreign capital outflows in emerging markets.

2.2.3 Validity of the instrument

For the stance of U.S. monetary policy (proxied by the U.S. interest rate) to be a valid instrument, it needs to be correlated with sovereign default decisions (i.e. the instrument is "relevant") but not with government expenditures on health and education as a share of GDP. In other words, the U.S. interest rate must have no effect on social expenditures on health and education as a share of GDP, other than its effect through a sovereign default (i.e. the "exclusion restriction" is satisfied).

As argued above, sovereign default decisions are correlated with U.S. interest rates through sudden stops of foreign capital flows. Hence, the instrument is relevant. Abrupt capital flow reversals often lead to economic distress and outright defaults on loans or a rescheduling of the debt payments, and

[4] See Table 8b (Sensitivity tests — stop episodes) in Forbes and Warnock (2012). Although it is not clear which column reflects the outcome of solely using the U.S. interest rate instead of global interest rate, eight out of ten sensitivity tests (which all use the U.S. interest rate) are significant.

the monetary policy of the U.S., proxied by the U.S. interest rate, is a push factor of such foreign capital outflows. In addition, there is evidence that U.S. interest rates are uncorrelated with government expenditures on health and education in emerging and developing countries. For example, during the taper tantrum episode, emerging and developing countries with stronger economic fundamentals such as smaller budget deficits, high domestic savings and investment rates, lower debt and more reserves in prior periods, were not hit less hard by the increase in the U.S. interest rate (Eichengreen & Gupta, 2015).

Although hikes in the U.S. interest might be uncorrelated with government expenditures, the main dependent variable in this paper is social expenditures *as a share of GDP* and empirical evidence suggests that sudden stops caused by hikes in the U.S. interest can also have a direct effect on GDP. In the case of a fixed exchange rate regime, higher U.S. interest rates can cause higher domestic interest rates, which can for example result in lower investments, causing downward pressure on GDP (Di Giovanni & Shambaugh, 2008). Furthermore, in the case of a flexible exchange rate regime, an increase in U.S. interest rates will raise the rate of return on dollars above the rate of return on the emerging markets' currencies, leading investors to shift their investments back to U.S. assets, resulting in falling exchange rates among the developing economies. This can cause capital outflows and a decrease in investments, resulting in downward pressure on GDP. In other words, if left untreated, the exclusion restriction of this proposed instrument might not be satisfied. To safeguard against the violation of the exclusion restriction and to purge the abovementioned effects from the regression results, relevant control variables will be added to the analysis. These relevant control variables are domestic investment spending growth and net exports. The domestic investment spending growth is added to control for the downward pressure on GDP that is caused by investment changes triggered by rising domestic interest rates (in the case of fixed exchange rate regimes). The net exports will be used to control for the downward pressure on GDP that is caused by falling exchange rates among flexible exchange rate economies. After controlling for these two non-default channels, the remainder of the effect of variation in the U.S. interest rate on government expenditures on health and education as a share of GDP can plausibly be attributed to the default decision.

3 Data

In this chapter, first a description of the coerciveness index of Enderlein et al. (2012) will follow. Next, a discussion on the SPEED database, which contains data on social expenditures, and the measure of the U.S. interest rate, namely the U.S. 10-year Treasury yield, will follow. Finally, an overview of the final dataset will be presented, together with descriptive statistics.

3.1 Coerciveness index

In order to differentiate between hard and soft defaults, the coerciveness Index from Enderlein et al. (2012) is used. This index categorizes a government's policy vis-à-vis private external creditors in times of debt distress on a scale of 1 to 10, with 1 being very creditor friendly and 10 being very coercive towards creditors. The index was built by analyzing more than 20.000 pages of articles from the financial press, data sources on debt crisis and of numerous policy reports. When constructing the index, Enderlein et al. drew on the good faith criteria mentioned in the IMF's "Policy of Lending into Arrears" and the IIF's "Principles of Fair Debt Restructuring" (IMF, 1999; IMF 2002; IIF, 2016). According to these sources, good faith behavior of debtors includes among other things transparency in debt workouts, data sharing, collaboration with creditors, avoidance of unjustified capital control measures and the obligation to resume debt service payments as early as possible. The final index consists of nine sub-indicators and each sub-indicator reflects a coercive behavior that a government can adopt towards their private external creditors. Each sub-indicator is a dummy variable, which equals one (1) if the government showed the respective coercive behavior in a given year, and equals zero (0) otherwise. The sub-indicators can be categorized into two broad categories: measures of payment behavior and measures of negotiation behavior. The former captures government actions that have a direct impact on the financial flows towards private external creditors and the latter captures the negotiation patterns of governments. A description of each sub-indicator will now follow.

3.1.1 Indicators of government payment behavior

1. Missed payment

The first sub-indicator of payment behavior during debt crises is whether a government has missed a payment that is due to the debt contract. This dummy variable equals one (1) whenever the sovereign misses a principal or an interest payment on its bonds or commercial loans. Because of this broad definition, temporary suspensions or roll-over of debt payments are also included. Only when there are no missed payments, when the government manages to restructure its debt before running into arrears or when the

missed payment happens within the grace period of the debt contract, does this sub-indicator take the value zero (0). Missed payments happen in most sovereign debt crises, but there are exceptions. The two restructurings of Uruguay in the 1980s are example of restructurings without missed payments.

2. Unilateral payment suspension

The second sub-indicator captures whether a government has unilaterally decided on the suspension of debt payments. This dummy variable equals one (1) whenever a sovereign misses a payment without prior agreement with its creditors and/or if the creditors are not notified of the payment suspension beforehand. When a sovereign is not able to service its debt on time, a government can choose to negotiate with their creditors about the possibility of temporary debt roll-overs or other forms of bridge financing. This sub-indicator is included to distinguish between outright defaults and such "negotiated partial defaults" (Bulow & Rogoff, 1989). In practice, two-thirds of payment suspension decisions are taken unilaterally and without prior notice. Such outright defaults are reflective of coercive behavior and the unwillingness to cooperate with creditors.

3. Full payment suspension

The third sub-indicator captures the suspension of sovereign debt payments to private external creditors. This dummy variable equals one (1) when a sovereign suspends all payments, including interest, on bonds or commercial loans for more than 90 days in a given year. The full suspension of payments can be regarded as a separate indicator of payment behavior, given that it is a particularly coercive policy. The IIF (2016) requires that debtors resume, as far as possible, partial debt service as a sign of good faith and resume full payment of the principal and interest as conditions allow. A full suspension of payments therefore sends a strong signal of a government's unwillingness to pay.

4. Freeze on foreign assets

The fourth and last sub-indicator of government payment behavior is whether a government effectively freezes a creditor's assets in the debtor country. This dummy variable equals one (1) whenever a government introduces any kind of capital or exchange control during the sovereign debt crisis that directly affects debt flows to private external creditors. This type of debtor policy is particularly coercive and observed only on rare occasions (Trebesch & Zabel, 2017). Examples include capital controls that prohibit private domestic firms in the debtor country to make debt repayments to foreign creditors (implemented by Argentina in 1983) or exchange controls that led to a notable reduction of private sector debt repayments to foreign banks or bondholders (implemented by Pakistan in 1998).

3.1.2 Indicators of government negotiation behavior

5. Breakdown or refusal of negotiations

The fifth sub-indicator concerns the government induced breakdown or refusal of restructuring negotiations. This dummy variable equals one (1) whenever a government refuses to enter into negotiations with its creditors or whenever a government causes a breakdown in the debt negotiations for more than three months in a given year. As mentioned above, the IMF suggests that negotiating with creditors is crucial for fair debt restructurings (IMF 1999, 2002). Nonetheless, government-induced delays and refusals to negotiate are very common.

6. Explicit default declaration

The sixth sub-indicator concerns explicit default declarations. Most sovereign defaults occur without public announcement of the default decision. This dummy variable equals one (1) whenever a key government actor, such as the President, the Prime Minister, the Chief debt negotiator or the Minister of Finance or Economy, publicly declares the default decision. Explicit default declarations are not common, given that most governments will try to be discrete and quiet about a missed payment. Such official default declarations can therefore be considered as analogous to a "declaration of war" to foreign bondholders and banks, and thus reflective of coercive government behavior.

7. Explicit threats to repudiate on debt

The seventh sub-indicator is an explicit threat to repudiate on debt. This dummy variable equals one (1) whenever a key government actor threatens private external creditors to repudiate on sovereign debt. Such threats can be considered as a clear signal of non-cooperative behavior. An example of a threat to repudiate is Chile in 1986, where Chilean dictator Pinochet responded to human rights condemnation and pressure from the United States with a threat to permanently repudiate on bank loans from the U.S.

8. Data disclosure problems

The eights sub-indicator captures data disclose problems. The availability of reliable data on debt stocks or exchange reserves of a sovereign is essential for creditors to evaluate restructuring offers and a government's capacity to repay. Data disclosure problems are therefore considered as reflective of coercive government behavior. This dummy variable equals one (1) whenever a government explicitly refuses to provide information on crucial negotiation related issues or if there is an open dispute with creditors due to inaccurate data. Examples include Nigeria (1983) and the Philippines (1983), where data disputes were a central stumbling block during debt negotiations.

9. Forced and non-negotiated restructuring

Lastly, the final sub-indicator concerns forced and non-negotiated restructurings. This dummy variable equals one (1) whenever the restructuring is enforced unilaterally or launched without prior consultation with private external creditors on the terms and conditions of the restructuring. This last sub-indicator differentiates between negotiated and unilateral debt restructurings, which are a clear signal of non-cooperative negotiation behavior. Examples of forced restructurings are Peru (1986) and Nigeria (1990), where the governments unilaterally decided to lower the interest rate on the bonds.

The final coerciveness index is additive. An index value of zero (0) applies in times without default or debt negotiations, or in other words, if a government services all its sovereign debt on time. A value of one (1) applies at the start of a sovereign debt crisis, when the government announces a debt restructuring, but no coercive behavior is observable during that year. An example of a debt crisis with index value 1 is when the debt is restructured with a haircut in cooperation with the creditors and without missed payments or threats. Because the final coerciveness index is additive and the minimum index value during a crisis is 1, this implies that if four sub-indicators are met, the index equals five. The average government coerciveness index is 3.60. See Figure 1 for a graphical overview of the coerciveness index by Enderlein et al. (2012). Figure 2 shows the distribution of the coerciveness index. As can be seen, an index value of 1 is the most common, followed by an index value of 5. Values of 6 and higher are relatively less common

Figure 1: Graphical overview of the coerciveness index by Enderlein et al. (2012).

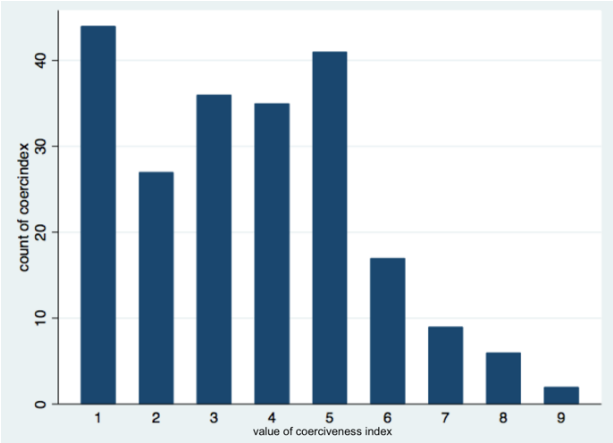

Figure 2: Distribution of the coerciveness index by Enderlein et al. (2012).

3.2 SPEED database

Data on social expenditures on health and education stems from the Statistics on Public Expenditure for Economic Development (SPEED) database, accessible via the Harvard Dataverse. This database has been made publicly available by the International Food Policy Research Institute (IFPRI). The SPEED database is compiled of information from multiple sources. The primary data source is the IMF Government Financial Statistics (GFS). This data is complemented with information from the World Bank and national governments. To make the data comparable across countries and to remove the influence of inflation over time, the data has been converted into constant 2010 purchasing power parity (PPP). Extensive data checks were conducted to ensure data consistency over time and across different sources.

This database was updated in 2019 and contains information on total government expenditures and its functional breakdown for eleven sectors, under which education and health. The indicators in this database are reported both as a share of total expenditures and GDP, as well as in billions of constant 2010 US dollars. This paper will consider the change in social expenditures on health and education as a share of GDP and the absolute level of social expenditures on health and education in constant 2010 U.S. dollars per capita.

3.3 U.S. interest rate

As argued in Chapter 2, the U.S. interest rate is proposed as an instrument for sovereign default decisions. This paper's measure of the U.S. interest rate is the 10-year Treasury yield, following the examples of Hoek, Yoldas and Kamin (2021) and Klemm and Sosa (2014). Annual data from 1980-2009 on the 10-year Treasury yield is retrieved from the OECD Monthly Monetary and Financial Statistics.

3.4 The final dataset

The dataset from Trebesch and Zabel (2017) serves as baseline dataset. Data on social expenditures on health and education as a share of GDP stemming from the SPEED database is added to this dataset. Data on net exports stems from the World Bank database and is also added to this baseline dataset. Table 1 shows the descriptive statistics of the variables included in the dataset. Because data on social expenditures in the years 1980-2009 could only be retrieved from the SPEED database for 38 developing and emerging countries, the baseline dataset of Trebesch and Zabel will be reduced from 52 to 38 countries. Table A.1 in the Appendix gives an overview of the country sample and the default years. In total, 21 default episodes with complete data on social expenditures on health and education can be identified. There are 15 more default episodes in the dataset, however for 7 of these there are no observations on social expenditures. For 8 episodes, social expenditures are only available for the last year(s) and the years after the episode, so these episodes will not be analyzed.

Besides data on social expenditures, the U.S. 10-year Treasury yield, the coerciveness index and the default dummy from S&P, the final dataset also contains information on the change in population in percentages (ΔPop)), the natural logarithm of total population in millions (*Log(pop)*, a dummy variable with a value of one at the beginning of a banking crisis (*Banking crisis*), a dummy variable with a value of one at the beginning of a currency crisis (*Currency crisis*), the ratio of average exports plus imports as a share of GDP (*Openness*), a dummy variable with a value of one in years with a change in the executive (*Government change*), the ratio of government debt to GDP in percentages (*Debt/GDP*), the change in a country's debt to GDP ratio over the past 5 years (Δ*Debt/GDP*), an annual index value of the civil liberties index published by Freedom House (*Civil lib*), the Institutional Investor's Country Credit Rating issued at the start of each year (*CR*), domestic investment spending growth (*Inv growth*), net exports (*Net exports*), a dummy variable coded 1 in case of an ongoing IMF program and 0 otherwise (*IMF program*) and the real per capita GDP growth rate (*GDP*).

Table 1 shows that governments' social expenditures as a share of GDP are, on average, higher on education compared to health. The country with the highest social expenditures on education as a share of GDP (12.7%) was Botswana in 2009. The country with the highest social expenditures on health as a share of GDP (7.6%) was Poland in 1996. Another statistic that stands out is the maximum value of the change in population. This value can be assigned to Qatar in 2007, which experienced a remarkable population growth of around 20.4% in one year. This extraordinary growth can be explained by the fact that Qatar's population existed for 76% of foreign workers in 2004, and 89.5% in 2019 (Snoj, 2019). Table

1 also shows that the developing and emerging countries in the dataset have, on average, a debt-to-GDP ratio of 51.3%. The maximum debt-to-GDP ratio of 289,9% was recorded in Bulgaria in 1993. Lastly, the credit rating scale ranges from zero (extremely high credit risk) to 100 (extremely low credit risk). The average credit rating of the countries in the dataset is 42,7. The country with the lowest credit rating (6.4) is El Salvador in 1984 and the highest (93.1) is Singapore in 2008.

Table 1: Summary statistics

	Observations	Mean	Standard deviation	Min	Max
Social expenditures health	1.159	1.86	1.42	0.04	7.62
Social expenditures education	1.177	3.45	2.03	0.07	12.66
Coerciveness index	1.462	3.6	1.490	0	9
Default	1.462	0.15	0.35	0	1
ΔPop	1.460	1.70	1.93	-2.62	20.43
Log(pop)	1.462	2.55	1.68	-1.03	7.19
Banking crisis	1.357	0.040	0.20	0	1
Currency crisis	1.462	0.040	0.20	0	1
Government change	1.373	0.17	0.37	0	1
Openness	1.406	86.96	64.52	11.55	460.47
Civil liberties	1.358	3.75	1.49	1	7
Debt-to-GDP ratio	1.297	51.29	34.95	1	289.60
Credit rating	1.367	42.67	17.27	6.4	93.1
IMF program	1.462	0.36	0.48	0	1
Domestic investment growth	1.241	6.71	47.53	-86.77	1,215.27
Real GDP per capita	1.462	4.864,37	7.233,69	186.44	61,374.75

4 Methodology

In this Chapter, the econometric strategy is presented. In the first part, the models for examining the impact of a default decision as measured by S&P (i.e. a binary variable) on social expenditures on health and education will be presented. In this part, both ordinary-least-squares and an instrumental variable approach will be employed. First, a description of the OLS estimation method and the accompanying challenges will be given. After that, the instrumental variable estimation method will be presented. In the second part of this Chapter, the model for examining the impact of the heterogeneity in debt crises will be discussed.

4.1 Sovereign defaults and social expenditures

4.1.1 Ordinary-least-squares

The aim of this paper is to analyze the impact of defaulting on government expenditures on health and education as a share of GDP during a default episode. Therefore, this paper is interested in the following (simplified) relationship:

$$\Delta Exp_{i,t} = \beta_0 + \beta_1 Default_{i,t} + \varepsilon_{i,t} \tag{1}$$

Where $\Delta \text{Exp}_{\text{i,t}}$ is the change in social expenditures on health or education as a share of GDP and $\text{Default}_{\text{i,t}}$ is a binary variable indicating whether a country defaults according to the definition of S&P (1 in years in which a payment was missed or debt was restructured, and 0 otherwise). There are however three main challenges when estimating this relationship. First, omitted variables might bias β_1, given that there might be common (un)observable shocks that affect both social expenditures and a default decision. The second challenge is reverse causality, since a country's default decision might be endogenous to the fiscal situation beforehand, resulting in a potential overestimation of the true causal effect. Countries might be forced to default because its social expenditures were unsustainably high in the first place. The third challenge is the fact that the dependent variable is measured as a share of GDP. There might be systematic movements in the GDP levels of emerging and developing economies around default episodes. If GDP systematically goes down around the default decision, it might seem that expenditures increase afterwards, but it is mainly because GDP dropped. Lora and Olivera (2006) overlooked this in their research. Taking into account these challenges, the baseline econometric model for examining the impact of defaulting on social expenditures is as follows:

$$\begin{aligned} \Delta Exp_{i,t} = {} & \beta_0 + \beta_1\, Default_{i,t} + Exp_{i,t-1} + CR_{i,t} + \Delta Debt/GDP_{i,t} + GDP_{i,t-1} + \\ & GDP_{i,t-2} + \mathbf{X}_{i,t} + \alpha_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \tag{2}$$

To address the problem of omitted variable bias, a vector of control variables commonly used in the literature on the costs of default is included (Sturzenegger, 2004). This vector $\mathbf{X}_{i,t}$ includes: the rate of population growth (ΔPop), the log of total population (*Log(pop)*), a dummy variable for banking crises (*Banking crisis*), a dummy variable for currency crises (*Currency crisis*), the general level of civil liberties (*Civil lib*) and a measure of openness (*Openness*). To control for unobservables that do not develop over time but are specific to each country, country fixed effects (α_i) are included. To control for unobservables that change over time but are the same for all countries, year fixed effects (λ_t) are included. To address the problem of reverse causality, lagged values of social expenditures on education and health ($Exp_{i,t-1}$), the start-of-year Institutional Investor's Country Credit Rating ($CR_{i,t}$) and the change in the debt/GDP ratio over the past 5 years ($\Delta Debt/GDP_{i,t}$). Finally, two lags of the annual growth rate of real GDP per capita ($GDP_{i,t-1}$, $GDP_{i,t-2}$) will also be controlled for, to limit the influence of systematic movements in GDP on the coefficient of the coerciveness index.

4.1.2 Instrumental variable approach

Despite these efforts, one can still not rule out that some unobserved, time-varying confounder is driving the results. Hence, the OLS estimates should be interpreted with caution. An instrumental variable can (in principle) solve this endogeneity concern. For an instrumental variable to be valid, it should satisfy the relevance and exclusion restriction. The relevance condition is met when the instrumental variable is a strong predictor of the endogenous variable, i.e. if Cov(X, IV) $\neq 0$. As a rule-of-thumb, this is the case when the F-statistic of the first-stage exceeds a value of 10 (Staiger & Stock, 1994).

As argued in Chapter 2, the U.S. 10-year Treasury yield is proposed as an instrument. It was argued that sovereign defaults are correlated with the U.S. interest rate through sudden stops of foreign capital flows, i.e. suggesting that Cov(Default, U.S. interest rate) $\neq 0$. Now, a two-stage-least-squares strategy will be employed to confirm this. In the first stage, the relevance of the instrument will be tested and the endogenous variable (Default) is predicted based on the instrument (the U.S. interest rate). The first stage of the regression is as follows:

$$\widehat{Default}_{i,t} = \beta_0 + \beta_1 \, U.S. \, interest \, rate_{i,t} + \mathbf{X}_{i,t} + \alpha_t + \lambda_t + \varepsilon_{i,t} \tag{3}$$

Where U.S. interest rate denotes the U.S. 10-year Treasury yield and Default denotes the predicted value based on the instrument. The same vector of controls is added, as well as country and year fixed effects. In the second stage, the predicted value of Default is used to estimate the dependent variable,

social expenditures on health and education as a share of GDP. For the second condition (the exclusion restriction) to be satisfied, the instrumental variable should be exogenous, i.e., Cov(IV, $\varepsilon_{i,t}$) = 0. As was argued in Chapter 2, sudden stops caused by hikes in the U.S. interest rate can directly affect GDP. For example, in the case of a fixed exchange rate regime, higher U.S. interest rates can cause higher domestic interest rates, which can for example result in lower investments, causing downward pressure on GDP. Furthermore, in the case of a flexible exchange rate regime, an increase in U.S. interest rates will raise the rate of return on dollars above the rate of return on the emerging markets' currencies, leading investors to shift their investments back to U.S. assets, resulting in falling exchange rates among the developing economies. This can cause capital outflows and a decrease in investments, resulting in downward pressure on GDP. In other words, if left untreated, the exclusion restriction might not be satisfied. To safeguard against this and to purge the abovementioned effects from the regression results, relevant controls will need to be added. These relevant control variables are domestic investment spending growth and net exports. The second stage is as follows:

$$\begin{aligned}\Delta Exp_{i,t} = \beta_0 + \beta_1 \widehat{Default}_{i,t} + Inv_{i,t} + Net\ exports_{i,t} + GDP_{i,t-1} + GDP_{i,t-2} + \\ \mathbf{X}_{i,t} + a_t + \lambda_t + \varepsilon_{i,t}\end{aligned} \tag{4}$$

As can be seen, the default variable $Default_{i,t}$ is replaced with the predicted default variable. The variable $Inv_{i,t}$ denotes the domestic investment spending growth, which is added to control for the downward pressure on GDP that is caused by investment changes triggered by rising domestic interest rates (in the case of fixed exchange rate regimes). On the other hand, the variable $Net\ exports_{i,t}$ is used to control for the downward pressure on GDP that is caused by falling exchange rates among flexible exchange rate economies. In addition, control variables are included, as well as time and country fixed effects. Finally, two lags of the annual growth rate of real GDP per capita ($GDP_{i,t-1}$, $GDP_{i,t-2}$) will again be controlled for, to limit the influence of systematic movements in GDP on the coefficient of the default decision. After adding the vector, the time fixed effects, the country fixed effects, the pre-crisis GDP growth rates and controlling for the two non-default channels, the remainder of the effect of variation in the U.S. 10-year Treasury yield on government expenditures on health and education as a share of GDP can plausibly be attributed the default decision. A comparison between the OLS and IV estimates will also take place to analyze whether or not the model estimated with OLS still contains any bias.

4.2 Debtor coerciveness and social expenditures

The second aim of this paper is to take the heterogeneity of debt crises into account when analyzing their impact on social expenditures, by using a continuous default measure instead of a default dummy. Accounting for the heterogeneity of debt crises will determine whether besides the incidence of a default, the scope and severity of a default also matter for government expenditures. Hence, this paper is interested in the following (simplified) relationship:

$$\Delta Exp_{i,t} = \beta_0 + \beta_1 \, Default_{i,t} + \gamma_1 \, Default \times Coerc_{i,t} + \varepsilon_{i,t} \tag{5}$$

Equation (5) is a multiplicative interaction model in which the default dummy variable is interacted with the coerciveness index by Enderlein et al. (2012). The variable $Default_{i,t}$ will be included in all specifications to assure that the model is properly identified. However, the default coefficient no longer shows an unconditional marginal effect as in a standard multivariate regression (Brambor, Clark Golder, 2006). This variable can therefore no longer be interpreted at face value when the interaction term is also included. When estimating the impact of debtor coerciveness on social expenditures, the same challenges as discussed in Section 4.1 play a role. First, omitted variables might bias γ_1, given that there might be common (un)observable shocks that affect both social expenditures and debtor coerciveness. The second challenge is reverse causality, since the severity of a country's default decision might be endogenous to the fiscal situation beforehand. The third challenge is again the fact that the dependent variable is measured as a share of GDP. There might be systematic movements in the GDP levels of emerging and developing economies around default episodes. Taking these challenges into account, the main econometric model for examining the effect of debtor coerciveness on social expenditures on education and health during a default is as follows:

$$\begin{aligned} \Delta Exp_{i,t} = \beta_0 + \beta_1 \, \widehat{Default}_{i,t} + \gamma_1 \, \widehat{Default} \times Coerc_{i,t} + Inv_{i,t} + Net\ exports_{i,t} + \\ Exp_{i,t-1} + CR_{i,t} + \Delta Debt/GDP_{i,t} + GDP_{i,t-1} + GDP_{i,t-2} + \mathbf{X}_{i,t} + \alpha_i + \lambda_t + \varepsilon_{i,t} \end{aligned} \tag{6}$$

Now, the default variable is instrumented by the U.S. 10-year Treasury Yield and interacted with the coerciveness index. Again, domestic investment growth and net exports are controlled for to safeguard against the violation of the exclusion restriction and to purge the effects of these two non-default channels from the regression results. In addition, to address the before mentioned challenges, again country and time fixed effects, a vector of controls, lagged values of social expenditures, the start-of-year country's credit rating, the change in the debt-to-GDP ratio over the past 5 years and pre-crisis GDP growth rates are included.

5 Results

In this Chapter, the results will be presented. The Chapter is divided into three parts. In the first part, a preliminary analysis will follow in which the data is presented graphically. In the second part, government expenditures as a share of GDP on education during a default episode will be analyzed, and in the third part government expenditures as a share of GDP on health. The impact of a default decision as measured by S&P (i.e. a binary variable) on social expenditures will be estimated by using both OLS and an IV approach. These results will then be compared to the results of Lora and Olivera (2007). A comparison between the OLS and IV estimates will also take place. After that, the heterogeneity of debt crises will be considered by analyzing the impact of debtor coerciveness on social expenditures.

5.1 Preliminary analysis

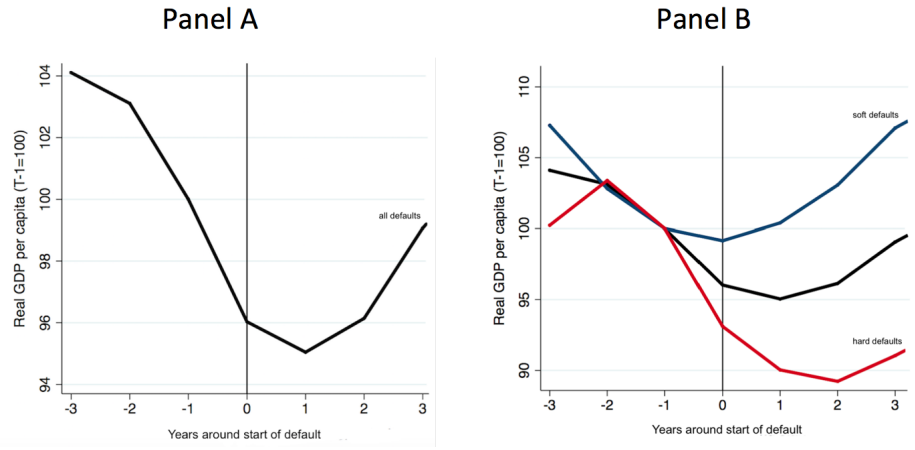

Figure 3: Real GDP around the start of default.

Before turning to the analysis of social expenditures during a debt crisis, a graphical view of the data will be presented. Figure 3 shows the performance of real GDP per capita around the default date, from three years before until three years after the default decision. The default decision is labeled as year zero (the vertical line). GDP is normalized to 100 in the year prior to the default decision. Panel A illustrates the average GDP performance per capita of all defaulting countries in the dataset. On average, GDP starts to decline prior to a debt crisis and keeps declining the year in which the default decision is taken. One year later, however, GDP starts to recover. Panel B divides the sample into hard and soft defaults. GDP behaves different after dividing the sample in two groups. Soft defaults are characterized by almost no drop in GDP in the first default year, and a quick recovery afterwards. However, hard defaulting countries experience a much larger drop in GDP in the first default year, with a further decline during the following year. Thereafter, GDP starts to slowly recover, but remains below its pre-crisis level.

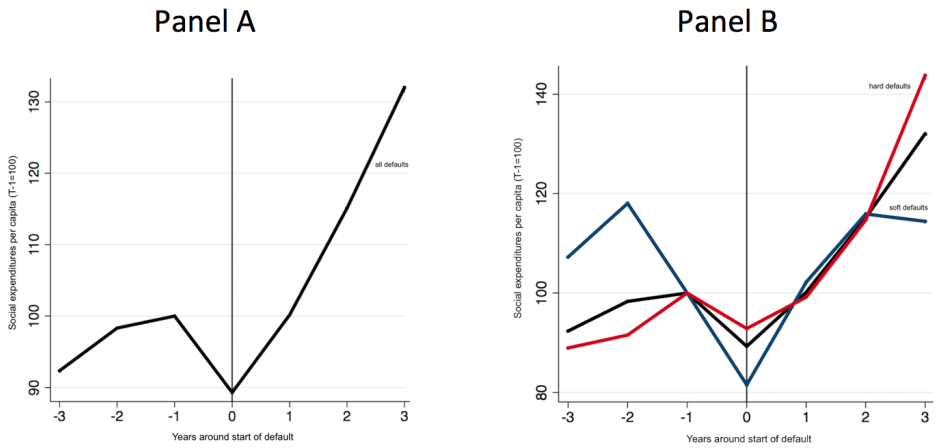

Figure 4: Social expenditures around the start of default.

Figure 4 shows the performance of social expenditures both on health and education per capita around the default date, again from three years before until three years after the default. Panel A illustrates the average social expenditure performance of all defaulting countries in the dataset. As can be seen, social expenditures start to decrease one year before the default decision, but immediately start to recover in the first default year. They reach their pre-crisis level again within the first year. For comparison; GDP did not reach its pre-crisis level within three years. In panel B, the sample is again divided into hard and soft defaults. As can be seen, soft defaulting countries experience on average a larger drop in expenditures in the first default year. However, both soft and hard defaults experience an increase in social expenditures thereafter. For soft defaults, it takes on average two years to reach their pre-crisis level. For hard defaults, it takes only one year. Now, this paper will turn to the quantitative assessment of the relationship between sovereign defaults and social expenditures during a default episode.

5.2 Social expenditures on education

5.2.1 Ordinary-least-squares

Before turning to this paper's main model for estimating the impact of a default decision on social expenditures (with an instrumental variable), the OLS estimates will be presented. In Column 1 of Table 2, a bare bones specification is shown, in which the change in social expenditures on education as a share of GDP is regressed on the dummy variable capturing whether a country is in default. Year and country fixed effects are included to control for global time trends and time-invariant country-specific effects. According to the estimate in Column 1, a default decision is associated with a decline of -0.072 percentage points in social expenditures as a share of GDP in the following year. This coefficient is however not significant and very likely to be biased.

Table 2: OLS results education

	Education expenditures		
	(1)	(2)	(3)
Default	-0.072	-0.056	-0.119*
(dummy)	(0.057)	(0.058)	(0.067)
Social exp. educ_{t-1}			-0.008
			(0.059)
Social exp. health_{t-1}			0.018
			(0.045)
Credit rating (dummy)			0.003
			(0.003)
Change debt to GDP ratio_{t-1}			0.000
			(0.000)
Real GDP per capita growth rate_{t-1}			-0.005
			(0.004)
Real GDP per capita growth rate_{t-2}			0.000
			(0.006)
Controls	No	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	1.110	1003	883
R-squared	0.070	0.073	0.097

Notes: The dependent variable is the change in social expenditures on education as a share of GDP, measured in percentage points. The key explanatory variable is the default dummy. All specifications include a (non-reported) constant. Robust standard errors are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

As discussed in Chapter 4, there are three major challenges: omitted variables, reverse causality and the fact that social expenditures as a share of GDP is being used as dependent variable. To deal with omitted variables, in Column 2 a vector of control variables is included. The coefficient changes slightly when these variables are controlled for but remains insignificant. To deal with the problem of reverse causality, in Column 3 lagged values of social expenditures, the start-of-year country's credit rating and the change in the debt-to-GDP ratio over the past 5 years are included. These variables are indicative of structural problems in a government's finances prior to the default decision. In addition, pre-crisis GDP growth rates are included for in Column 3 to limit the influence of systematic movements in GDP on the default

coefficient. After taking into account these challenges, the coefficient of the default dummy in Column 3 changes and becomes significant at 10% level. The estimate indicates that a default decision is associated with a decline of -0.119 percentage points in social expenditures on education as a share of GDP in the following year.

5.2.2 Instrumental variable approach

Table 3: First stage result

	Default
	(1)
U.S. interest rate	-0.045*
	(0.024)
U.S. interest rate$_{t-1}$	0.044***
	(0.014)
U.S. interest rate$_{t-2}$	-0.016
	(0.058)
Controls	Yes
Year FE	Yes
Country FE	Yes
Observations	1.021
F-statistic	14.25
R-squared	0.403

Notes: The dependent variable is a country's default decision, as measured by S&P. The key explanatory variable is the U.S. 10-year Treasury yield. Robust SE given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels.

Despite these efforts, one can still not rule out that some unobserved, time-varying confounder is driving the results. Hence, the OLS coefficients should be interpreted with caution. An instrumental variable approach can solve this endogeneity concern, if the instrument is valid. The U.S. 10-year Treasury yield has been proposed as an instrument for default decisions in this paper. As explained in Chapter 4, for this instrumental variable to be valid, it should satisfy the relevance and exclusion restriction. Table 3 reports the first stage regression results to assess the instrument relevance. Besides the contemporary U.S. interest rate, two lags of the U.S. interest rate, a vector of controls and fixed effects are included. As can be seen, both the contemporary and one year lagged U.S. 10-year Treasury yields are significant at 10% and 5% respectively. The F-statistic exceeds the critical value of 10. Hence, the proposed instrument meets the requirement of a meaningful first stage.

Table 4: IV results education

	Education expenditures		
	(1)	(2)	(3)
Default	0.644*	0.635**	0.658**
(dummy)	(0.324)	(0.288)	(0.290)
Domestic investment		-0.001	-0.001
spending growth		(0.002)	(0.002)
Net exports		0.000	0.000
		(0.000)	(0.000)
Real GDP per			0.004
capita growth rate$_{t-1}$			(0.004)
Real GDP per			-0.002
capita growth rate$_{t-2}$			(0.005)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	1.085	1.142	1.194
R-squared	0.091	0.102	0.103

Notes: The dependent variable is the change in social expenditures on education as a share of GDP, measured in percentage points. The key explanatory variable is the default dummy, instrumented by the 10-year Treasury Yield. All specifications include a (non-reported) constant. Robust standard errors are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Now turning to the main model for estimating the impact of a default decision on social expenditures. Column 1 of Table 4 shows the results using the U.S. 10-year Treasury yield as a source of exogenous variation in sovereign default decisions. Year and country fixed effects, as well as control variables are included. The found estimate indicates that a default decision is associated with an increase of 0.644 percentage points in social expenditures as a share of GDP in the following year and is significant at 10%. The validity of this result depends on the assumption that defaulting has no direct effect on current social expenditures as a share of GDP. However, as discussed in Chapter 4, this exclusion restriction might not be satisfied because sudden stops caused by hikes in the U.S. interest rate can directly affect GDP. Column 2 therefore directly controls for two non-default channels (by including domestic investment spending growth and net exports), and checks whether the addition of these two variables affects the default estimate. As can be seen in Column 2, the default variable barely changes but becomes sig-

nificant at 5%. Domestic investment spending growth and net exports are insignificant. Finally, Column 3 represents Equation (4). The only difference with Column 2 is that two lags of the annual growth rate of real GDP per capita are added to limit the influence of systematic movements in GDP. The found estimate implies that a default decision is associated with an increase of 0.658 percentage points in social expenditures as a share of GDP in the following year and is significant at 5%. This finding reinforces the argument that defaulting enables resources that were dedicated to debt servicing to be reallocated to the domestic population through increased social expenditures on education.

The sign of the IV coefficient does not come as a surprise. Lora and Olivera (2007) also found a positive effect on social expenditures as a share of GDP, but they found that the effect had, on average, a range of 0.4%-0.5% of GDP. Hence they found a smaller effect. This can be explained by the fact that Lora and Olivera did not take into account that their dependent variable is measured as a share of GDP. As Figures 3 and 4 have shown, not only social expenditures increase after default decision, but GDP also systematically goes up after the first default year. In other words, because of the fact that not only the numerator (social expenditures) increases after the default decision, but also the denominator (GDP), this results in downward pressure on the social expenditures to GDP ratio. This can explain the smaller effect found by Lora and Olivera. Considering that this paper controls for the systematic trends around the default episode and employs an instrumental variable approach, one can conclude that defaulting is associated with an increase of 0.658 percentage points in social expenditures as a share of GDP in the following year.

What is noticeable is that the IV default estimate has the opposite sign compared to its OLS counterpart. The OLS default estimate in Column 3 of Table 3 indicates that a default decision was associated with a decline of -0.119 percentage points, but the IV estimate indicates that default decisions are associated with an increase of 0.658 percentage points. The sizeable difference between the OLS and IV estimates can be interpreted in two ways. First, the difference can indicate that, even after controlling for omitted variables, reverse causality and pre-crisis GDP, the OLS estimation method still suffers from endogeneity issues. However, some literature argues that the sizeable difference can also be interpreted as evidence that the instrument is not valid (Ciacci, 2021). Taking into account that (i) the IV has a meaningful first stage, (ii) safeguards against violations of the exclusion restriction have been put in place, (iii) the effects of two non-default channels have been purged from the regression results and (iv) that Lora and Olivera also found a significant positive effect of defaulting on social expenditures, in my view it is more likely that the OLS estimation method still suffers from endogeneity issues.

5.2.3 Debtor coerciveness

Now that we have established that defaulting results in higher social expenditures on education, the heterogeneity in debt crises will be taken into account to examine how social expenditures on education are affected in countries that experienced a hard default compared to countries that experienced a soft default. Trebesch and Zabel (2017) showed that it is crucial to account for the severity of defaults and not only for their occurrence when studying their consequences. The results are presented in Table 5.

In Column 1, the change in social expenditures on education as a share of GDP is regressed on the default variable (again instrumented by the U.S. 10-year Treasury Yield) and interacted with the coerciveness index by Enderlein et al. (2012). Only year and country fixed effects are included and the interaction term turns out negative but insignificant. In Column 2, the standard set of control variables is included to control for omitted variables and lagged values of social expenditures, the start-of-year country's credit rating and the change in the debt-to-GDP ratio over the past 5 years are included to account for reverse causality. In addition, pre-crisis GDP growth rates are included to limit the influence of systematic movements in GDP on the default coefficient. After taking into account these challenges, the coefficient of the default dummy in Column 2 changes slightly but remains insignificant. Because part of the interaction term is instrumented with the U.S. 10-year Treasury yield, the domestic investment spending growth rate and net exports are included as controls in Column 3 to safeguard against violations of the exclusion restriction and to purge the effects of these two non-default channels from the regression results. After including these two variables, the interaction term becomes significant at the 10% level. Column 3 represents Equation (6) and the estimate indicates that a one-notch increase in the index is associated with a -0.028 percentage points decline in social expenditures on education as a share of GDP.

The results seem to suggest that a hard default does not enable more resources that were dedicated to debt servicing to be reallocated to the domestic population. On the contrary, countries that have relatively less freed-up resources, increase their social expenditures more than countries who have experienced a hard default. To test for the robustness of this result, two additional control variables are included: government change in Column 4 and involvement of the IMF in Column 5. While time-invariant country characteristics, global time trends and a standard set of macro controls are controlled for in this paper, these results can still be biased due to the omission of time-varying country-specific variables correlated with both debtor coerciveness and social expenditures. One such potential confounder is the change of government, since debtor coerciveness may increase when a new government takes over and social expenditures might also be affected by this change in government. Column 4 shows the results after

Table 5: Debtor coerciveness education

	Education expenditures				
	(1)	(2)	(3)	(4)	(5)
Default	0.088	1.177***	0.959**	0.923**	0.928**
(dummy)	(0.223)	(0.406)	(0.407)	(0.387)	(0.387)
Default x Coerciveness	-0.022	-0.027	-0.028*	-0.027*	-0.027*
index	(0.017)	(0.016)	(0.067)	(0.015)	(0.015)
Social		0.022	-0.007	-0.003	-0.007
exp. educ_{t-1}		(0.058)	(0.057)	(0.056)	(0.057)
Social		-0.004	0.014	0.012	0.014
exp. health_{t-1}		(0.044)	(0.041)	(0.042)	(0.041)
Credit rating		0.019***	0.013**	0.013**	0.013**
(dummy)		(0.006)	(0.006)	(0.006)	(0.006)
Change debt to GDP		-0.001	-0.001	-0.001	-0.001
ratio_{t-1}		(0.001)	(0.001)	(0.001)	(0.001)
Real GDP per capita		-0.004	-0.001	-0.001	-0.001
growth rate_{t-1}		(0.004)	(0.004)	(0.004)	(0.004)
Real GDP per capita		0.002	-0.004	-0.004	-0.004
growth rate_{t-2}		(0.006)	(0.005)	(0.005)	(0.005)
Domestic investment			-0.002	-0.002	-0.002
spending growth			(0.002)	(0.002)	(0.002)
Net exports			0.000	0.000	0.000
			(0.000)	(0.000)	(0.000)
Government change				-0.041	
				(0.046)	
Ongoing IMF program					0.006
					(0.048)
Controls	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	862	816	701	707	708
R-squared	0.077	0.118	0.120	0.120	0.118

Notes: The dependent variable is the change in social expenditures on education as a share of GDP, measured in percentage points. The key explanatory variable is the interaction term Default x Coerciveness. Robust SE are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels

controlling for a dummy indicating a change in the executive, taken from the Database of Political Institutions (DPI). The estimate of the interaction term does not change and remains significant at 10% level. Another potential confounder is the involvement of the IMF, since the IMF typically demands governments to adopt a cooperative policy towards external creditors and IMF programs can be conditional on socioeconomic reforms, such as increased social expenditures (IMF, 2021). Column 5 shows the results after controlling for a binary variable for ongoing IMF programs. Again, the estimate of the interaction term does not change and remains significant at 10% level.

Table 6: OLS results health

	Health expenditures		
	(1)	(2)	(3)
Default	0.012	0.005	0.012
(dummy)	(0.039)	(0.039)	(0.056)
Social			-0.280**
exp. health$_{t-1}$			(0.133)
Social			0.102**
exp. education$_{t-1}$			(0.047)
Credit rating			-0.002
(dummy)			(0.003)
Change debt to GDP			0.000
ratio$_{t-1}$			(0.000)
Real GDP per			0.000
capita growth rate$_{t-1}$			(0.003)
Real GDP per			0.004
capita growth rate$_{t-2}$			(0.005)
Controls	No	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	1.103	996	882
R-squared	0.042	0.047	0.122

Notes: The dependent variable is the change in social expenditures on health as a share of GDP, measured in percentage points. The key explanatory variable is the default dummy. All specifications include a (non-reported) constant. Robust SE given in parentheses. ***, **, and * denote significance at the 1, 5, and 10%

5.3 Social expenditures on health

5.3.1 Ordinary-least-squares

The first set of results with regards to social expenditures on health are presented in Table 6. Column 1 starts again with a bare bones specification, in which the change in social expenditures on health as a share of GDP is regressed on the dummy variable capturing whether a country is in default. Country and time fixed effect are again included. According to the estimate in Column 1, a default decision is associated with an increase of 0.012 percentage points in social expenditures as a share of GDP in the following year, but this coefficient is not significant and likely biased. In Column 2, the same set of control variables is included. The coefficient changes, but remains insignificant. In Column 3, lagged values of social expenditures, the start-of-year country's credit rating and the change in the debt-to-GDP ratio over the past 5 years are included to deal with reverse causality and pre-crisis GDP growth rates are controlled for. The coefficient of the default remains insignificant, in contrast to the results for social expenditures on education, where the OLS coefficient became significant after including the same variables.

5.3.2 Instrumental variable approach and debtor coerciveness

Because it cannot be ruled out that some unobserved, time-varying confounder is driving the results, the U.S. 10-year Treasury yield is again used as an instrument for default decisions. Table 7 shows the results of this IV approach. As can be seen, all the default estimates in Columns 1, 2 and 3 are highly insignificant, indicating that sovereign defaults do not lead to a reallocation of resources that were previously reserved for debt-servicing to the domestic population in the form of increased social expenditures on health. However, in contrast to the previous results with regards to expenditures on education, the two non-default channels are now significant predictors. The domestic investment spending growth variable is negative and significant at 1% level and the net exports variable is negative and significant at 5% level. The insignificant default estimates come somewhat as a surprise, given that this paper did find a significant positive effect of defaulting on education expenditures in Section 5.2.2. This implies that defaulting does not have the same consequences for all government expenditures. There are also categories of expenditures that remain unaffected during a default episode. In this case, governments tend to only increase their education expenditures and not also their health expenditures.

Table 7: IV results health

	Health expenditures		
	(1)	(2)	(3)
Default	0.091	-0.056	0.074
(dummy)	(0.363)	(0.330)	(0.338)
Domestic investment		-0.005***	-0.005***
spending growth		(0.001)	(0.001)
Net exports		0.000**	0.000**
		(0.000)	(0.000)
Real GDP per			0.010**
capita growth rate$_{t-1}$			(0.004)
Real GDP per			0.000
capita growth rate$_{t-2}$			(0.003)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	860	741	741
R-squared	0.051	0.073	0.076

Notes: The dependent variable is the change in social expenditures on health as a share of GDP, measured in percentage points. The key explanatory variable is the default dummy, instrumented by the 10-year Treasury Yield. All specifications include a (non-reported) constant. Robust standard errors are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels, respectively.

Even though the occurrence of a sovereign default does not affect health expenditures, Table 8 explores the question whether debtor coerciveness nonetheless has an influence on social expenditures on health. Columns 1 to 3 present the results of the proposed multiplicative interaction model, in which the change in social expenditures on health as a share of GDP is regressed on the instrumented default variable and an interaction term with the coerciveness index. Columns 4 and 5 are robustness checks. The interaction term is positive but insignificant in most columns, implying that there is also no significant relationship between debtor coerciveness and social expenditures on health as a share of GDP in the following year. Since no significant results are found for both the instrumental variable and for debtor coerciveness, the results are discussed in a much more condensed manner.

Table 8: Debtor coerciveness health

	Health expenditures				
	(1)	(2)	(3)	(4)	(5)
Default	-0.003	0.200	-0.065	-0.114	-0.064
(dummy)	(0.017)	(0.459)	(0.456)	(0.443)	(0.442)
Default x	-0.016	0.002	0.011	0.012	0.012
Coerciveness index	(0.016)	(0.038)	(0.032)	(0.031)	(0.031)
Social		-0.306**	-0.304**	-0.302**	-0.304**
exp. health$_{t-1}$		(0.133)	(0.137)	(0.137)	(0.138)
Social		0.122**	0.127**	0.122**	0.128**
exp. educ$_{t-1}$		(0.051)	(0.058)	(0.057)	(0.058)
Credit rating		-0.001	-0.007	-0.007	-0.006
(dummy)		(0.008)	(0.007)	(0.007)	(0.008)
Change debt to GDP		-0.001	-0.001	-0.001	-0.001
ratio$_{t-1}$		(0.001)	(0.001)	(0.001)	(0.001)
Real GDP per capita		0.002	0.008**	0.009**	0.009**
growth rate$_{t-1}$		(0.004)	(0.004)	(0.004)	(0.004)
Real GDP per capita		0.006	0.002	0.002	0.002
growth rate$_{t-2}$		(0.004)	(0.004)	(0.004)	(0.004)
Domestic investment			-0.005***	-0.005***	-0.005***
spending growth			(0.001)	(0.001)	(0.001)
Net exports			0.000*	0.000*	0.000*
			(0.000)	(0.000)	(0.000)
Government change				0.066	
				(0.061)	
Ongoing IMF program					0.034
					(0.054)
Controls	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	862	817	702	708	709
R-squared	0.074	0.137	0.165	0.168	0.166

Notes: The dependent variable is the change in social expenditures on health as a share of GDP, measured in percentage points. The key explanatory variable is the interaction term Default x Coerciveness. Robust standard errors are given in parentheses. ***, **, and * denote significance at the 1, 5, and 10 per cent levels

6 Conclusion

Although many politicians and debt-forgiveness campaigners believe that sovereign debt service payments by poor countries come at the cost of social expenditures that contribute to the realization of human rights of their population, and some even advocate that poor developing countries should therefore stop repaying their sovereign debt, the relationship between sovereign default and social expenditures has largely been disregarded by economists. The only exception is Lora and Olivera (2006), who made an attempt to examine how a default decision affects social expenditures. However, doubts could be raised with regards to their methodology. The question whether defaulting on sovereign debt truly translates into higher social expenditures, like many seem to believe, therefore remained unanswered. This gap in the academic literature has been addressed by this paper and in this final Chapter, the beforementioned question will be answered and suggestions for further research will be given.

This paper finds that default decisions are indeed associated with an increase of some social expenditures, but not all. There are also categories of expenditures that are unaffected during a default episode. This paper looked at social expenditures on education and health. Regarding education expenditures, it has been shown that default decisions are associated with an increase of 0.658 percentage points in education expenditures as a share of GDP in the following year and this result is significant at 5%. However, no significant relationship is found for health expenditures. Because the default variable is likely to be endogenous, an instrumental variable approach has been used to estimate the abovementioned relationship. The U.S. 10-year Treasury yield is chosen as the instrument because (i) hikes in the 10-year Treasury yield are related to sovereign defaults through sudden stops in capital flows and (ii) the U.S. interest rate is uncorrelated with government expenditures on health and education in emerging and developing countries. However, because the U.S. interest rate could nevertheless have a direct effect on GDP (the denominator), additional safeguards have been put in place to ensure that the exclusion restriction is satisfied. This, in combination with the finding of a meaningful first stage, results in the confidence that this is a valid instrument and that the before mentioned positive relationship between defaulting an education expenditures can be interpreted as causal. This finding reinforces the argument by anti-debt campaigners that defaulting leads to the reallocation of freed-up resources to the domestic population through increased social expenditures on education.

In addition, it is shown that besides the incidence of a default, the scope and severity of a default also matter for education expenditures. A one-notch increase in the coerciveness index is associated with

a -0.028 percentage points decline in social expenditures on education as a share of GDP. This result seems to suggest that a hard default does not enable more resources that were dedicated to debt servicing to be reallocated to the domestic population. On the contrary, the estimate implies that countries that have relatively less freed-up resources, increase their social expenditures more than countries who have experienced a hard default. Again, no significant relationship between debtor coerciveness and health expenditures has been found. However, it is important to note that even though two additional robustness tests confirm the negative and significant relationship between debtor coerciveness and education expenditures, one can still not rule out that some unobserved, time-varying cofounder is driving the results. Hence, these results regarding debtor coerciveness should not be interpreted as evidence of causal effects.

The finding that sovereign default decisions affect social expenditures on education, and not expenditures on health, was unexpected. It would be interesting to see how government expenditures in other sectors react during a default expenditures. The SPEED database can again be used to examine this, because this database also contains information on total government expenditures, as well as its functional breakdown for nine more sectors. Furthermore, neither this paper, nor Lora and Olivera (2006), examined the impact of debt relief on social expenditures after the default period. Another suggestion for further research is to test how debt relief, for example proxied by the size of the haircut, affects post-default social expenditures. So far, there are only two in-depth analyses of the link between social expenditures and debt relief (Chauvin Kraay, 2005; Dessy Vencatachellum, 2007). Both papers do not find a significant effect for debt relief in itself. However, only debt relief by bilateral and multilateral creditors is considered in these papers, and not debt relief by private external creditors. It would also be interesting to see how haircuts negotiated between governments and foreign banks and bondholders affect the level of government spending in emerging and developing economies in post-default periods.

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8 Appendix

Table A.1: Country sample and default years

List of defaulters, with years of default between brackets
Argentina 1980-2009 (1983-1992; 2001-2005)
Bulgaria 1980-2009 (1991-1994)
Chile 1980-2009 (1983-1990)
Costa Rica 1980-2009 (1981-1990)
Dominican Republic 1980-2009 (1982-1994; 2005)
Jordan 1980-2009 (1989-1993)
Mexico 1980-2009 (1982-1990)
Morocco 1980-2009 (1986-1990)
Nigeria 1980-2009 (1982-1992)
Pakistan 1980-2009 (1998-1999)
Panama 1980-2009 (1983-1996)
Philippines 1980-2009 (1983-1992)
Romania 1980-2009 (1981-1983; 1986)
Turkey 1980-2009 (1982)
Ukraine 1987-2009 (1998-2000)
Uruguay 1980-2009 (1983-1985;1990;2004-2005)

List of non-defaulters
United Arab Emirates 1980-2009
Azerbaijan 1995-2009
Bahrein 1980-2009
Belarus 1991-2009
Botswana 1980-2009
China 1980-2009
Colombia 1980-2009
Egypt 1980-2009
Hungary 1980-2009
India 1980-2009
Kuwait 1995-2009
Lebanon 1992-2009
Lithuania 1990-2009
Mauritius 1980-2009
Malaysia 1980-2009
Oman 1980-2009
Papua New Guinea 1980-2009
Singapora 1980-2009
El Salvador 1980-2009
Swaziland 1980-2009
Syria 1980-2009
Thailand 1980-2009
Tunisia 1980-2009