

# Labour and Financial crises: Is Labour Paying the Price of the Crisis?\*

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## Abstract

This paper investigates the relationship between the labour share and financial crises. While Diwan (2001) or Maarek & Orgiazzi (2013) focused on the currency crisis, we propose to see if their analyses can be extended to the banking crisis and how it can influence the relative bargaining power of labour and capital within firms. To this end, we use international panel data of the share of labour in GDP. We confirm the existence of a negative trend for the labour share, which is largely explained by financial crises. However, the results differ for currency and banking crises. Currency crises affect the labour share negatively, while banking crises primarily affect capital income, at least during the year of the crisis. In the three years following a currency crisis, the labour share tends to be reduced by around 2% per year on average.

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# 1 Introduction

In the context of the financial crisis, one of the questions often asked not only by academics and policy makers, but also by the man on the street is the following: are the workers going to be the ones who are hit the hardest by the crisis? In other words, is labour going to pay the price for the crisis? There are several reasons to believe that labour may be mainly targeted by a financial crisis. In a crisis, the workers' bargaining power becomes weaker (Harrison, 2002), due not only to the fast increase in unemployment (ILO and IMF, 2010), but also to entrepreneurs' expectations. The crisis creates a "*labour run*", where layoffs are widely expected. Another explanation may be that labour is less mobile than capital, so that while capital can be easily reallocated to other sectors, regions or countries, labour cannot.

Social protection plays a key role smoothing the adverse consequences of financial crises on inequality and poverty (Jenkins *et al.*, 2012). In most countries, social protection is financed through labour income taxes or social contributions mainly (Barrientos, 2008). If financial crises alter the labour share, it may also have adverse consequences on the capacity of States to finance social protection and therefore to deal with the distributional impact of financial crises. It is therefore crucial to have a closer look at the financial crises' impact on the labour share, beyond its impact on income distribution.

This paper addresses the influence of banking and currency crises on the labour share empirically. This research was largely motivated by the empirical work of Isaak Diwan (2001). Using a database of the labour share from 1972 to 2000, Diwan shows that before an exchange rate crisis, the labour share increased, and after the crisis it dropped dramatically, without ever reaching its pre-crisis level again. Maarek & Orgiazzi (2013) recently show that currency crises lower the aggregate manufacturing labour share by 2 points on average, using manufacturing sectoral panel data for 20 countries which have experienced currency crises. They highlight two types of effects: within-sector changes induced by modifications in the relative bargaining power of workers, and composition effects induced by structural change and show that the effects are driven by within-sector changes.

We propose to extend the analysis by showing the impact of both currency and banking crises. In the light of the current financial crisis, it is important to provide empirical evidence based on previous experiences of banking crises also. These crises are more severe in terms of magnitude and length (Kaminsky & Reinhart, 1999). The impact on GDP is always negative, contrary to currency crises which may have positive effects, at least in the medium run. Banking crises are also more often systemic and it is much more difficult to protect from them. However, it should be noted that banking crises and currency crises often occur simultaneously.

There is an emerging literature studying the relation between financial crises and income inequality (see Bazillier & Hericourt (2016) for a review). Rajan (2010) argues that rising inequality in the past three decades explain the increased pressure for affordable housing finance which led to the lending boom observed prior to the crisis. Kumhof *et al.* (2015) show theoretically how increased inequality may explain a rapid increase in leverage which possibly leads to crises. However, Bordo & Meissner (2012) show empirically that rising income concentration plays no significant role in explaining credit growth. Their estimations cover 14 countries for the 1920-2008 period. These papers mainly focus on the *causes* of financial crises and not their consequences, which is the purpose of this paper. Concerning these consequences, there is a large literature explaining the determinants of the heterogeneous impact of financial crises on output (see for instance Berkmen *et al.* (2009), or Rose & Spiegel (2011) for the current crisis, or Mishra *et al.* (2003) and Eichengreen & Rose (1998) on banking crises). Artha & de Haan (2011) show that the impact on output largely depends on labour market flexibility. However, these papers mainly focus on the consequences in terms of output. Surprisingly, there are few papers on the distributional impact of financial crises. Baldacci *et al.* (2002) identify four channels through which financial crises affect poverty and income distribution: the output effect which may have indirect effects on income distribution, relative price changes, fiscal retrenchment, and changes in assets.

We show that banking and currency crises have very different impacts on the labour share. We find that currency crises affect the labour share negatively, while banking crises primarily

affect capital income, at least the year of the crisis. In the three years following a currency crisis, the labour share tends to be reduced by around 2% per year on average. We propose two sets of estimations: the first one includes both developing and developed countries and the second one focuses on OECD countries. For OECD countries, the effect of systemic banking crises appears to be greater than in non-OECD. We find a positive effect the year of the crisis, followed by a negative effect the following years. This may be explained by the larger share of the banking and financial sector in developed countries, which makes the banking crises more severe.

The paper is organised as follows. In the second section, we identify the transmission channels of banking and currency crises on the labour share, focusing on their influence on the bargaining power of workers. In the third section of the paper, we present the database and the empirical strategy. We present the empirical results in the fourth section and conclude in the fifth section.

## 2 Financial Crises, Bargaining Power and Labour Share

The goal of this section is to explain how financial crises can influence the labour share. Brock & Dobbelaere (2006) identified three channels through which international trade may affect the labour share in a rent-sharing framework. The first one is related to the financial situation of firms which affects the size of the rent. The second one is the influence on the bargaining outcome through the relative threat points of firms and workers. And the third one is the bargaining power *per se*. It appears that financial crises may affect the labour share through the same three channels.

A currency crises is likely to affect the size of the rent, through two channels: the recessionary effects of currency crises and the value of national investments, if measured in international currency. The first distributional impact is therefore related to the output impact of such crises. As shown by Mishra *et al.* (2003), currency crises have heterogeneous effects on output, 40% have been expansionary. However, crises in large and more developed countries have a higher probability of being recessionary. If it is the case, it will reduce labour income, but not necessarily its share in the total income. It will depend on the relative speed of adjustment of capital and

labour following a negative shock. The second channel related to the value of national investments is likely to have a negative impact on the labour share. The lower level of national investments, measured in international currency has a negative impact on the capital output ratio. There is also a short-term negative impact on real wages due to an increase in the price of imported products. The effect on the relative threat points of firms and workers is ambiguous. If firms are dependent on imported intermediate goods, it may increase their incentive to relocate and may also reduce the workers' bargaining power. On the contrary, if firms are mainly exporters, they will benefit from a drop in the exchange rate and their incentive to relocate will be lower. The consequences in terms of unemployment will also affect the workers' bargaining power. As for the output impact of currency crises, the effects on unemployment are thus ambiguous<sup>1</sup>.

Banking crises are likely to have a different impact on the labour share. First, banking crises have been shown to have strong adverse consequences on output (Eichengreen & Rose, 1998) and thus unemployment. This will tend to reduce the size of the rent. If the wage adjustment is slow, it may primarily affect capital income. But again, it will depend on the relative speed of adjustment of capital and labour. The effect of banking crises on the relative threat points of workers and firms is negative for workers. As the output impact of banking crises is negative, banking crises are followed by a rise of unemployment, generally, which has a negative effect on the workers' threat point and on their relative bargaining power. Also, banking crises may have negative impact on the labour share due to liquidity traps and defaults. This will reduce the expected income for investors and thus increase the incentive to delocate. Overall, the final effect on the labour share are thus ambiguous. One important consideration is the timing, as the short-term effects may differ from the effects in the medium run, especially as the wage adjustment is slow.

It is often difficult to disentangle currency and banking crises as the occurrence of twin crises is high, especially because currency crises may explain the triggering of banking crises (Kaminsky & Reinhart, 1999). Twin crises are generally more severe in terms of output. The specific effect

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<sup>1</sup>It is also noteworthy that unemployment is an important determinant of currency crises (Eichengreen & Jeanne, 2000).

of twin crises is therefore related to the distributional impact of recession. However, we do not expect additional and specific effects of twin crises on the relative bargaining power of workers.

Explanations based on the bargaining power assume that we are in a rent-sharing framework. There are economic rents at the firm level, and these rents are shared between capital and labour based on their respective bargaining power. However, one should note that financial crises are also likely to have a distributional impact in a competitive market. This is the channel of capital accumulation. If crises affect the capital output ratio, it should have an impact on the labour share also. Nevertheless, our empirical strategy will identify the effect of crises mainly through the bargaining channel, as we will also control for the capital output ratio in the empirical specification.

## 3 Empirical Analysis

### 3.1 Empirical Specification and Econometric Issues

As we have just explained, financial crises may have an effect on the labour share through the capital output ratio in competitive markets and it may also have an effect through the bargaining power of workers in a rent-seeking framework. In order to illustrate this idea, one can use the model proposed by Bentolila & Saint-Paul (2003) explaining the determinants of the *share-capital* (SK) curve, which is defined as *the stable relationship between the labour share and an observable variable, the capital-output ratio*. They then show that bargaining may be a factor explaining deviations from this stable relationship between the labour share and the capital-ratio. Given a certain level of the capital-output ratio, the labour share tends to increase. As stated by Bentolila & Saint-Paul (2003), “*increases in workers’ bargaining power reduce the sensitivity of the labour share to the capital-output ratio*”. Our hypothesis is that financial crises may affect the labour share through the workers’ bargaining power.

Following this model, we propose to explain the labour share by the capital-output ratio and by variables measuring this bargaining power, including various variables of financial crises. We

also argue that workers bargaining power is likely to be impacted by trade openness, FDI and government expenditures (as a proxy for social protection).

International openness may have an effect both on the bargaining power and the labour share. It is well known that in the Heskher-Ohlin framework, international trade is a substitute for factor mobility, with a process of equalisation of factor remunerations explained by the relative evolution of capital and labour-intensive goods. If Brock & Dobbelaere (2006) found little evidence of the influence of international trade on the bargaining power, Harrison (2002) considers that globalization may also have an influence on the relative bargaining power of labour and capital because capital can move towards the countries with the highest return. She found that rising trade shares will reduce the labour share. Diwan (2001) finds the same effect but showed that this drop will largely be concentrated in periods of crisis. Sylvain (2008) shows that openness has a strong impact on the labour share in most Continental Europe countries, but that the effect is not significant for Anglo-Saxon countries. Lastly, Jayadev (2007) explains the declining labour share by the increased capital account openness. Theoretically, FDI may be seen as a threat point for employers. If delocating economic activities is easy, the employers' bargaining power increases. However, this assumption has been challenged empirically by Brock & Dobbelaere (2006). On the contrary, social protection and labour market institutions may have a positive impact on the workers' bargaining power due to an increase in their threat point. GDP per capita is also included. Following Harrison (2002), we consider it as a proxy for the returns on labour abroad, which may affect the workers' bargaining power negatively (the higher the GDP per capita, the lower the return on labour abroad respectively). We also add dummy variables for currency and banking crises. In order to capture possible *ex-post* effects, we add lagged dummies for each type of crisis. The estimating equation is then:

$$\begin{aligned} \ln S_{L,i,t} = & \beta_i + \beta_1 \ln k_{i,t} + \beta_2 \ln GDP_{i,t} + \beta_3 \ln FDI_{i,t} + \beta_4 \ln TRADE_{i,t} \\ & + \beta_5 \ln GVT_{i,t} + \beta_6 TIME + \beta_8 CRISES_{i,t} + \beta_9 CRISES_{i,t...t-5} + \epsilon_{i,t} \end{aligned} \quad (1)$$

where  $S_{L,i,t}$  is the labour share,  $k_{i,t}$  is the capital - output ratio,  $GDP_{i,t}$  is the GDP per capita,  $FDI_{i,t}$  is the level of ingoing and outgoing foreign direct investments,  $TRADE_{i,t}$  is the openness ratio,  $GVT$  the government spending,  $TIME$  is a time-trend,  $CRISES_{i,t}$  is a dummy variable taking the value 1 if there is a financial crisis at period  $t$  (see the following section for a more detailed description of variables).

The model is estimated using fixed effects within estimators with a time trend ( $TIME$ ) over the 1970 - 2002 period.<sup>2</sup> The inclusion of a time trend can be justified by the intense debate in the literature over the stability of the labour share. Kaldor (1960) underlines this stability as a stylised fact, and the Cobb-Douglas function is a theoretical justification for this stability. This stability has however been challenged recently (Azmat *et al.*, 2007; Young, 2010). Even if we retain the idea of a stability at the world level, regional or national disparities may exist.<sup>3</sup> Caballero & Hammour (1997) suggest the possibility that the elasticity of substitution between capital and labour is superior to one, which may explain the drop in the labour share in various European countries. One other important reason to include a time trend is the capital-augmenting technical progress. Guscina (2007) argues that the decline in the labour share in OECD countries is an equilibrium, more than a cyclical phenomenon because of this. If the capital-augmenting technical progress is country-specific, it will be included in individual fixed effects ( $\beta_i$ ). If it is global, the time trend ( $TIME$ ) will capture this effect.

One potential econometric problem is the possible bias created by the endogeneity of the capital-output ratio ( $\ln k$ ). The labour share defines the relative distribution of income among workers. By symmetry, it also defines the income of owners of capital. This income may be influenced by the capital-output ratio, but one may think that the relation is the reverse: the higher the price of capital, the lower the investment. As the price of capital is an important

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<sup>2</sup>It was not possible to extend the period covered by the study beyond 2002 because of a major breakdown in the methodology used by the UN to calculate the labour share. Comparing the data before and after 2002 is thus very difficult and the inclusion of both periods is likely to introduce a bias in the estimate.

<sup>3</sup>Blanchard (1997) focused, within industrialised countries, on the distinctions between Anglo-Saxon countries and Continental Europe (with a higher variation for countries from Continental Europe). Bental & Demougin (2010) consider that labour market institutions characterised by moral hazard and irreversible investment may explain the declining labour share observed in these countries theoretically.



determinant of the income of owners of capital, it may affect the stock of capital and thus the capital-output ratio. This possible reverse causality creates an endogeneity bias in OLS estimations that can be corrected using Two Stage Least Square (TSLS) estimates.<sup>4</sup> The instruments used in the first stage of the estimations must be orthogonal to the error term  $\epsilon_{i,t}$  but correlated with our endogenous variable ( $\ln k$ ). As it is very difficult to find valid and relevant external instruments, we propose to use lagged values of the capital-output ratio as instruments. We will find the appropriate lag respecting both conditions. To test the validity of our instruments, we use the Hansen J statistics of overidentifying restrictions. We use the clustering robust version of the Cragg-Donald Statistic suggested by Stock & Yogo (2005) and the F-test of excluded instruments in the first stage of estimations as tests for weak instruments.

Standard errors are clustered at the country level, in addition to the standard White correction for heteroskedasticity.

## 3.2 Data

We use a large panel of countries (see the list of countries included in the panel in Annex 1) over the 1970-2002 period. The main variable of interest is the share of GDP that goes to labour. We have decided to use the *compensation paid to resident and non-resident households* (the UN's national accounts table on the use of GDP, Table 103) because of the large number of countries covered by this database, including developing and developed countries. This variable was also used by Harrison (2002) and Diwan (2001). Compensation includes wages and other benefits.<sup>5</sup> Figure 1 gives the worldwide average labour share using these data. We will test the robustness of

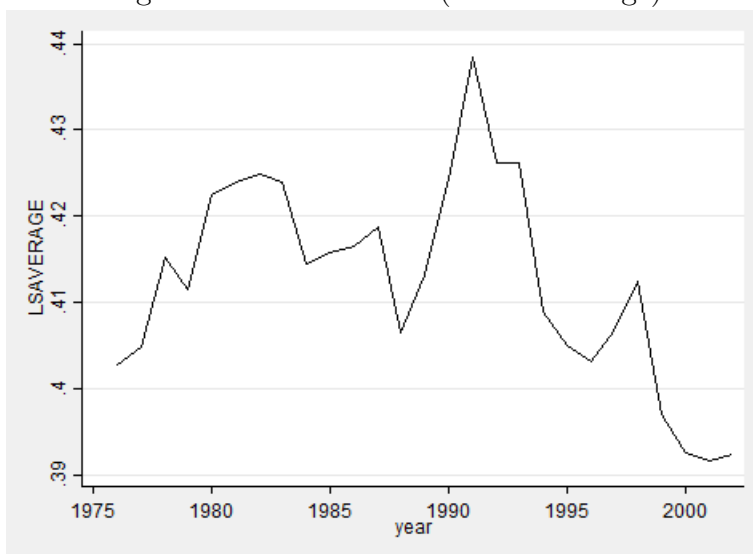
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<sup>4</sup>The TSLS estimation is a special case of the Generalized Method of Moments (GMM) approach (Verbeek, 2004). Contrary to studies including a lagged dependent variable in the exogenous set, our estimations suffer from no systematic bias, which is traditionally solved by taking a (GMM) estimation. The theoretical model does not require to include a lagged value of the labour share in the set of right-hand side variables.

<sup>5</sup>The use of these data has been discussed: Gollin (2002) argued that labour income is underestimated in small firms, and has to be adjusted for self-employment income and that we should take the differences in the sectoral composition of output into consideration. Unfortunately, data on self-employment income are very limited and international comparisons are difficult. Harrison (2002) proposes to test the robustness of her results by estimating the labour share and shows that “*results are qualitatively the same, although there are some differences (in the magnitude of the estimated coefficient).*”

our results by using the data built by Sylvain (2007) for OECD countries. Contrary to Maarek & Orgiazzi (2013), we do not use sectoral data, which allows us to extend the geographical coverage of our study. One should note that Maarek & Orgiazzi (2013) find that most changes following a crisis are not driven by composition changes. The use of sectoral data is therefore not necessary to assess the impact on the labour share at the national level.

Figure 1: Labour Share (World Average)



Source: UN National Accounts database. Calculations by the authors.

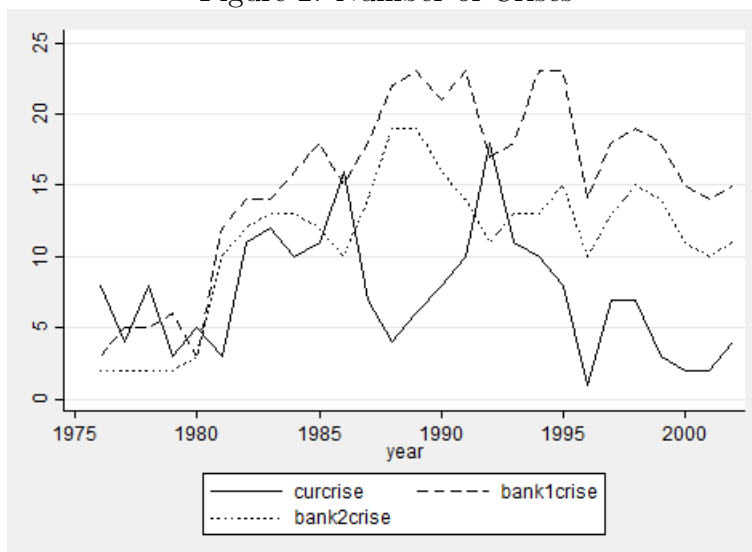
Concerning currency crises (*Curr.Cr.*), we use here various indexes as proposed and computed by Berman (2009): the weighted average of the exchange rate and international reserves variation with a weight such that the two components have equal volatility. Following Eichengreen & Bordo (2002), the threshold retained is one and a half standard deviation of this index.<sup>6</sup> For banking crises<sup>7</sup>, we use the data of Caprio & Klingebiel (2002) with a distinction between small (*BK1*) and systemic (*BK2*) crises. Figure 2 gives a global overview of the occurrence of crises over the

<sup>6</sup>The traditional measure of currency crises, used by Diwan (2001), is the one proposed by Frankel & Rose (1996): they define the currency crash as a large change in the nominal exchange rate (25%) accompanied by an increase of the rate of change of the nominal depreciation (10%). Here, we focus on the “foreign exchange market pressure”, taking both exchange rates and international reserves variation into account.

<sup>7</sup>The definition of a banking crisis is a situation where “*much or all bank capital is exhausted*”(Caprio & Klingebiel, 2002).

period. There are 199 currency crises and 412 banking crises (systemic and non-systemic) in the original databases. In our sample of 45 countries<sup>8</sup> used for econometric estimations, we have 134 banking crises, 82 systemic banking crises and 54 currency crises.

Figure 2: Number of Crises



Source: curcrise (Eichengreen & Bordo); bank1crise (borderline and systemic crises, Caprio & Klingebiel); bank2crise (systemic crises, Caprio & Klingebiel)

For capital stock, we use the methodology proposed by Caselli (2004). We compute the initial capital stock  $K_0$  as  $I_0/(g+\delta)$  where  $I_0$  is the value of investment in the first year available and  $g$  is the average geometric growth rate for the investment series between the first year with available data and 1980.<sup>9</sup>  $\delta$  is set to 0.06 following Caselli (2004).<sup>10</sup> Then we generate estimates of the capital stock,  $K$ , using the perpetual inventory equation ( $K_t = I_t + (1 - \delta)K_{t-1}$ ). Investment data and GDP (in international dollars, PPP) come from Penn World Table 6.3 (Heston *et al.*,

<sup>8</sup>The choice of countries included in the sample was driven by data availability. Our goal was to include both developed and developing countries. Concerning developed countries, we propose a robustness check using data built by Sylvain (2007) for the 12 main OECD countries.

<sup>9</sup> $I_0/(g + \delta)$  is the value of the steady-state in the Solow model.

<sup>10</sup>One can of course argue that the depreciation rate is likely to differ among countries. However, we argue this would have very little impact on the estimates, due to the inclusion of country fixed effects. These fixed effects allows us to control for unobserved heterogeneity, including these differences in depreciation rate between countries.

2009), labour force data from the *World Development Indicators* (WDI).

For variables influencing the bargaining power of workers, we use governmental expenditures, the openness ratio, FDI inflows and outflows. For governmental expenditures, we use general government final consumption expenditures (% of GDP). This variable is used as a proxy for the general level of social protection<sup>11</sup> and comes from the World Development Indicators. The gross inflows and outflows of foreign direct investment are also from this database. For trade openness, we use the variable  $\frac{X+M}{GDP}$  from WDI.

## 4 Empirical Results

### 4.1 Results for all Countries

Table 1 presents the determinants of the labour share using data from UN national accounts. These estimates clearly show a negative impact of currency crises on the labour share. The effect is significant in the three years following a crisis. All things being equal, the labour share is reduced by around 2.5% the first year after a crisis. The estimated effect is around -2% the following year and then -2.5% again. We do not find significant results in the following years (except five years after the crisis when using a TSLS estimator). This result is robust to the inclusion of different variables of banking crises (*BK1* refers to small banking crises and *BK2* to systemic banking crises). Five years after a currency crises, the cumulative effect is a 10% decline in the labour share. We also test specifications with a different number of lags and we still find a strong negative effect in the first years after a crisis.<sup>12</sup>

The effects of banking crises are very different. The year of a crisis, we observe a higher level of the labour share (by around 2%). However, this result is not significant the following

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<sup>11</sup>The Government Finance database (GFS) proposes more specific data on social protection expenditures. Unfortunately, there is a number of problems using this data for a large sample of countries and for the time interval we have. First, the methodology changes in 1990 and it is very difficult to get comparable data over the whole sample. Also, using this data, the number of countries included in our sample falls to 22. That is why we have preferred to use general governmental expenditures as a proxy.

<sup>12</sup>Results not reproduced here.

years (except the year after a crisis when using TSLS estimates). The cumulative effect is not significant also. Banking crises primarily affect capital income. And banking crises have a strong negative impact on the output. In our estimates, we do not observe any distributional impact, suggesting that owners of capital and workers are negatively affected in the same proportion.

In all TSLS estimates, we use the fourth and fifth lagged values of this variable as instruments of the capital-output ratio.<sup>13</sup> Results are perfectly similar when we include currency crises only or banking crises only.<sup>14</sup>

Concerning the other variables, we find a strong negative trend over the period. When estimating different subsamples, we find that this negative trend becomes stronger after 1980 approximatively. This result confirms some of the results in the literature (Guscina, 2007) challenging the hypothesis of stability for the labour share. This result is also valid for the non-OECD countries that are included in our sample. The theoretical reasons invoked to explain this negative trend may also be relevant for developing or emerging countries (in particular the capital-augmenting technological progress). Each year on average, the labour share is reduced by around 0.4 to 0.8 %. The other main result we obtain is the weak explanative power of the capital-output ratio. If the estimated coefficient is positive in OLS estimates, it becomes negative when instrumenting this variable. However, in both cases, the coefficient is not significant. Several factors may explain this result. First, our sample includes developing countries where the capital stock is very low. The relative price and income of labour may thus be influenced by other factors. Also in some countries in our sample, a large part of the workers earn their wages in the informal sector and are not included in these statistics. When controlling for the

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<sup>13</sup>This choice can be justified by the need to find both relevant and valid instruments. When using the first lagged values (the first and the second, the second and the third and the third and the fourth), the correlation with the capital-output ratio is very high, but the Hansen test clearly rejects the hypothesis of orthogonality between these instrument subsets and the error term. When using the fourth and the fifth lagged values, the Hansen test cannot reject the non-validity of the instruments, while the Cragg-Donald Test and the robust F-statistic of the excluded instruments allow us to reject the weakness of such instruments which would bias the estimated coefficients. It is often considered that the F-statistics should be over 10 to reject the hypothesis of weak instruments.

<sup>14</sup>Results available upon request.

Table 1: OLS and TSLS Estimates of Labour Share Determinants

Dep. Var.	lnLS	lnLS	lnLS	lnLS	lnLS	lnLS
	(OLS)	(TSLS)	(OLS) with BK1	(TSLS) with BK1	(OLS) with BK2	(TSLS) with BK2
Time Trend	-0.00650*** (-2.696)	-0.00494** (-1.991)	-0.00887*** (-2.816)	-0.00821*** (-2.743)	-0.00867** (-2.573)	-0.00801** (-2.503)
Capital - Output Ratio	0.152 (1.433)	-0.152 (-1.093)	0.0670 (0.783)	-0.0461 (-0.398)	0.0609 (0.729)	-0.0496 (-0.416)
GDP per cap.	0.110 (1.021)	0.0636 (0.509)	0.319** (2.657)	0.304** (2.567)	0.317** (2.521)	0.301** (2.421)
Trade	-0.0486 (-0.913)	-0.0238 (-0.374)	-0.0654 (-1.391)	-0.0583 (-1.138)	-0.0643 (-1.383)	-0.0566 (-1.145)
FDI in	0.0100 (0.864)	-0.00846 (-1.075)	-0.0128 (-1.139)	-0.0167 (-1.436)	-0.0139 (-1.176)	-0.0176 (-1.439)
FDI out	-0.000282 (-0.0332)	0.00488 (0.511)	0.00482 (0.672)	0.00395 (0.510)	0.00411 (0.542)	0.00318 (0.397)
Gvt. Spend.	0.169** (2.256)	0.195** (2.313)	0.149 (1.617)	0.162* (1.748)	0.152 (1.624)	0.165* (1.751)
Curr. Cr.			-0.0148 (-1.185)	-0.0133 (-1.127)	-0.0150 (-1.177)	-0.0137 (-1.130)
Curr. Cr. -1			-0.0251** (-2.160)	-0.0240** (-2.148)	-0.0264** (-2.191)	-0.0256** (-2.213)
Curr. Cr. -2			-0.0212* (-1.845)	-0.0197* (-1.770)	-0.0208* (-1.703)	-0.0194 (-1.630)
Curr. Cr. -3			-0.0264** (-2.277)	-0.0264** (-2.352)	-0.0249** (-2.114)	-0.0246** (-2.155)
Curr. Cr. -4			-0.00937 (-1.017)	-0.0113 (-1.256)	-0.00817 (-0.926)	-0.00972 (-1.144)
Curr. Cr. -5			-0.0195 (-1.675)	-0.0209* (-1.808)	-0.0195 (-1.679)	-0.0206* (-1.783)
BK Cr.			0.0201** (2.313)	0.0212** (2.287)	0.0259* (1.911)	0.0283** (2.051)
BK Cr.-1			0.0104 (1.596)	0.0122* (1.761)	0.0164 (1.591)	0.0192* (1.777)
BK Cr.-2			0.00291 (0.483)	0.00273 (0.447)	0.00185 (0.231)	0.00126 (0.161)
BK Cr.-3			0.00115 (0.198)	0.00152 (0.287)	-0.00271 (-0.260)	-0.00215 (-0.225)
BK Cr.-4			0.00477 (0.874)	0.00404 (0.722)	0.00882 (0.925)	0.00591 (0.635)
BK Cr.-5			-0.00475 (-0.507)	-0.00600 (-0.650)	-0.0113 (-0.805)	-0.0127 (-0.923)
Linear combination of coefficients (Curr. Cr. -1 + ... + Curr. Cr. -5)			-0.10154** (-2.01)	-0.10229** (-2.12)	-0.09981* (-1.93)	-0.10002** (-2.02)
Linear combination of coefficients (BK. Cr. -1 + ... + BK. Cr. -5)			0.01452 (0.65)	0.01448 (0.66)	0.01311 (0.44)	0.01150 (0.38)
Observations	890	836	645	641	645	641
R-squared	0.251	0.198	0.374	0.361	0.375	0.363
Number of Countries	69	63	45	41	45	41
Cragg-Donald Stat.	NA	226.8	NA	401.9	NA	416.4
Robust F-Stat (excluded Inst.)	NA	27.28	NA	95.89	NA	95.49
Hansen J Stat.	NA	0.00165	NA	0.481	NA	0.496
P-value Hansen test	NA	14 0.968	NA	0.488	NA	0.481

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Instruments: Lagged (4th and 5th) values of capital-output ratio (in log) Curr. Cr.: Currency crises; BK1: Systemic and non-systemic banking crises; BK2: Systemic banking crises.

occurrence of a crisis, we find a positive and significant relation with the GDP per capita. If we assume that countries with a higher income also have a higher level of capital, the capital-output effect may also be partly captured by this variable.

Trade and FDI seem to have no significant impact. The coefficients are negative for trade with a level of significance close to 15%. On the contrary, government spending is positively and significantly correlated with the labour share with an elasticity included between 0.16 and 0.19. If we consider it as a proxy for social protection, we can interpret this result as illustrating the positive impact of the workers' bargaining power. It is worth noticing that this effect is stronger than the capital-output ratio *for our sample including both developing and developed countries*. We will see further that we obtain different results when focusing only on OECD countries.

In table 2, we ask whether twin crises have an additional effects compared to the effects of banking crisis or currency crisis individually. Interestingly, we do not find any additional effect of twin crises on the labour share. The fall of the labour share is only explained by the currency crisis and the combination with a banking crisis does not affect this result.<sup>15</sup>

## 4.2 Results for OECD Countries

In this section, we use the labour share index proposed by Sylvain (2007) for OECD countries. This index was built using the OECD ANA database. He makes several corrections in order to (i) take into account self-employed workers income, (2) improve the estimates of non-wage labour income. Using this variable, we are thus able to measure two things: (1) whether our results using UN data are consistent with those obtained using corrected OECD data, and (2) whether our results are valid for OECD countries.

Table 3 gives the results of these estimates.<sup>16</sup> Some results are similar to the previous ones,

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<sup>15</sup>We only present the results of the linear combination of the 5 lagged coefficients for each type of crises (currency crises, banking crises and twin crises). The estimated coefficients for twin crises are not significant for any of the 5 lags.

<sup>16</sup>We only reproduce the estimated coefficients for the contemporary effect of currency crises and banking crises

Table 2: OLS and TSLS Estimates of Labour Share Determinants: the role of Twin crises

Dep. Var.	lnLS (OLS) with BK1	lnLS (TSLS) with BK1	lnLS (OLS) with BK2	lnLS (TSLS) with BK2
Curr. Cr.	-0.0130 (-0.841)	-0.0107 (-0.741)	-0.0162 (-1.167)	-0.0140 (-1.086)
Curr Cr. [-1,-5]	-0.11552* (-1.66)	-0.11303* (-1.71)	-.01233* (-1.97)	-.12037** (-2.04)
BK Cr.	0.0218** (2.361)	0.0231** (2.366)	0.0279** (2.093)	0.0305** (2.202)
BK Cr. [-1,-5]	0.00812 (0.48)	0.00951 (0.52)	-0.00605 (-0.21)	-.00491 (-0.16)
Twin Cr.	-0.00390 (-0.220)	-0.00640 (-0.372)	0.00645 (0.398)	0.00293 (0.173)
Twin Cr. [-1,-5]	0.03869 (0.52)	.03010 (0.41)	0.08334 (0.99)	0.07176 (0.89)
Observations	645	641	645	641
R-squared	0.377	0.364	0.381	0.369
Number of countries	45	41	45	41

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Instruments: Lagged (4th and 5th) values of capital-output ratio (in log) Curr. Cr.: Currency crises; BK1: Systemic and non-systemic banking crises; BK2: Systemic banking crises. Same control variables are included (estimated coefficients not reported here). Curr Cr. [-1,-5], BK Cr. [-1,-5] and Twin Cr. [-1,-5] are the linear combination of the sum of coefficients from lag 1 to lag 5.



but we can also notice interesting differences. Overall, we still find a negative impact of currency crises on the labour share. However, this effect is significant only the second and third years following the crises. As a result, the cumulative effect five years after a currency crisis is longer significant. We observe a negative and significant effect the three years following the crisis. The magnitude of the effect is also a bit smaller: between 1.7 and 2% two and three years after the crisis. The cumulative effect three years after the crisis is -5% approximately.

One very interesting result concerns the effect of systemic banking crises. The effect the year of the crisis is clearly positive, with a higher magnitude than for the previous estimations (around 5%). It confirms the fact that banking crises primarily affect capital income. However, the effect is clearly negative in the following years (the second, third and fourth years), with an effect included between 1% and 2% per year. The cumulative effect three years after a banking crisis is around -2%. The effect is translated to workers in the following years. The larger size of banking and financial sector in developed countries may explain the stronger impact compared to developing countries. Both the output and distributional impact are likely to be stronger when the share of financial and banking activities is higher in the economy.

The effect is smaller when studying the effect of all banking crises. We find an estimated 0.6% drop in the labour share the year following the crisis and a cumulative effect of -1.8% three years after the crisis.

We still find a strong negative trend, with a magnitude which is similar to the previous estimates. The main difference is the positive and significant result for the estimated coefficient of the capital-output ratio when using OLS estimates. However, the result is no longer significant when instrumenting this value, suggesting a strong reverse causality bias. Government spending no longer plays a significant role. Our interpretation is that the State plays a prominent role in the determination of the workers' bargaining power mainly in developing countries. In developed countries, structural determinants of the labour share such as the capital-output ratio play a greater role. This can be explained by the low level of private formal employment in some

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and the linear combination of the coefficients for lags 1-5. Detailed results for each lags and for other control variables are available upon request.

Table 3: OLS and TSLS Estimates of Labour Share Determinants: OECD Countries

Dep. Var.	lnLS (OLS)	lnLS (TSLS)	lnLS (OLS) with BK1	lnLS (TSLS) with BK1	lnLS (OLS) with BK2	lnLS (TSLS) with BK2
Curr. Cr.			-0.00250 (-0.296)	-0.000361 (-0.0437)	-0.00693 (-0.775)	-0.00512 (-0.600)
Curr Cr. [-1,-5]			-.04973 (-1.16)	-0.05522 (-1.38)	-0.06097 (-1.49)	-0.06367 (-1.59)
Curr Cr. [-1,-3]			-0.04254 (-1.71)	-0.04344* (-1.88)	-0.05075** (-2.26)	-0.05102** (-2.31)
BK Cr.			0.0133 (1.419)	0.0147 (1.611)	0.0532*** (9.331)	0.0580*** (12.42)
BK Cr. [-1,-5]			-0.0163 (-0.99)	-.02180 (-1.39)	-.00193 (-0.05)	-.01841 (-0.50)
BK Cr. [-1,-3]			-0.016203 (-1.77)	-0.01810** (-2.02)	-0.02255* (-2.01)	-0.02585** (-2.17)
Observations	368	347	314	314	314	314
R-squared	0.542	0.516	0.565	0.548	0.589	0.576
Number of Countries	12	12	12	12	12	12
Cragg-Donald Stat.	NA	325.6	NA	316.1	NA	331.0
Robust F-Stat (excluded Inst.)	NA	126.42	NA	109.04	NA	127.76
Hansen J Stat.	NA	0.000	NA	0.327	NA	0.373
P-value Hansen test	NA	0.995	NA	0.567	NA	0.541

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Instruments: Lagged (2nd and 3rd) values of capital-output ratio (in log) Curr. Cr.: Currency crises; BK1: Systemic and non-systemic banking crises; BK2: Systemic banking crises. Labour share: Sylvain (2007) Curr Cr. [-1,-5]: Linear combination of coefficients (Curr. Cr. -1 + ... + Curr. Cr. -5). BK Cr. [-1,-5]: Linear combination of coefficients (BK Cr. -1 + ... + BK. Cr. -5).

developing countries, where most formal jobs are public. The influence of trade openness on the labour share seems to be low, confirming the results of Brock & Dobbelaere (2006). However, trade openness may affect the probability of a crisis and thus indirectly the labour share. Results are also similar when introducing successively currency crises and banking crises.<sup>17</sup>

In table 4, we estimate the effects of currency crises, banking crises and twin crises conjointly. If banking and currency crises are found to have a negative cumulative impact on the labour share (-6% for currency crises and -5.5% for systemic banking crises), the *additional* effect of twin crises is more positive (+8% in cumulative three years after the crisis). However, when looking to the individual estimated coefficients for each of the five lags, we can see that this effect is driven only by a positive and significant impact three years after the twin crisis. All other lags are not significant. This last result should therefore be interpreted with caution. One should note also that the net effect of twin crises (taking into account the estimated effect of currency crises, banking crises and the specific effect of twin crises) is not significant.

Finally, we would like to test the effect of labour market institutions. As it is clear in the Bentolila and Saint Paul model, the bargaining power of workers may explain an upward shift of the SK curve and therefore an increase in the labour share. Labour market institutions have a positive impact on such bargaining power (Checchi & García-Peñalosa, 2010). In order to do so, we use the employment protection legislation (EPL) index provided by the OECD.<sup>18</sup> Our analysis therefore focuses on OECD countries and we use the labour share statistics provided by Sylvain (2007). Our results concerning the effects of financial crises do not change drastically (see table 5), although the number of observations is falling. The coefficient of currency crises two years after turns not significant although still negative, which may be explained by this fall in the number of observations. As expected, the effect of employment protection legislation is positive and significant. One should note however that this result is only obtained when the capital-output ratio is instrumented. In OLS, the effect of EPL seems to be captured by this variable,

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<sup>17</sup>Results available upon request.

<sup>18</sup>See <http://www.oecd.org/els/emp/oecdindicatorsofemploymentprotection.htm>.

Table 4: OLS and TSLS Estimates of Labour Share Determinants in OECD countries: the role of Twin crises

Dep. Var.	lnLS	lnLS	lnLS	lnLS
	(OLS) with BK1	(TSLS) with BK1	(OLS) with BK2	(TSLS) with BK2
Curr. Cr.	-0.00663 (-0.860)	-0.00374 (-0.513)	-0.00826 (-0.963)	-0.00638 (-0.780)
Curr Cr. [-1,-5]	-0.06836 (-1.42)	-0.0737* (-1.66)	-0.0802* (-2.01)	-0.0828** (-2.16)
Curr Cr. [-1,-3]	-0.06004** (-2.11)	-0.06063** (-2.35)	-0.0625** (-2.60)	-0.0631*** (-2.75)
BK Cr.	0.0128 (1.158)	0.0146 (1.354)	0.0552* (2.107)	0.0609*** (2.608)
BK Cr. [-1,-5]	-0.02879 (-1.73)	-0.0336** (-2.11)	-0.0581 (-1.30)	-0.0728* (-1.76)
BK Cr. [-1,-3]	-0.02617** (-2.36)	-0.0277** (-2.55)	-0.0555*** (-4.02)	-0.0593*** (-4.64)
Twin Cr.	0.0116 (0.738)	0.00891 (0.575)	0.0350 (1.206)	0.0315 (1.302)
Twin Cr. [-1,-5]	0.0581 (1.25)	0.0575 (1.46)	0.1283* (2.14)	0.1291** (2.41)
Twin Cr. [-1,-3]	0.0526 (1.55)	0.0515* (1.84)	0.0809* (1.82)	0.0831** (1.99)

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Instruments: Lagged (2nd and 3rd) values of capital-output ratio (in log) Curr. Cr.: Currency crises; BK1: Systemic and non-systemic banking crises; BK2: Systemic banking crises. Labour share: Sylvain (2007). Same control variables are included (estimated coefficients not reported here). Curr Cr. [-1,-5], BK Cr. [-1,-5] and Twin Cr. [-1,-5] are the linear combination of the sum of coefficients from lag 1 to lag 5.

which reflects a positive correlation between EPL and such ratio. When it is instrumented, the positive coefficient turns not significant and the effect of EPL is revealed.

Table 5: OLS and TSLS Estimates of Labour Share Determinants: the role of employment protection in OECD Countries

Dep. Var.	lnLS (OLS)	lnLS (TSLS)	lnLS (OLS) with BK1	lnLS (TSLS) with BK1	lnLS (OLS) with BK2	lnLS (TSLS) with BK2
EPL	0.0238 (0.555)	0.145*** (2.723)	0.0358 (0.901)	0.119*** (3.243)	0.0398 (1.234)	0.109*** (3.210)
Curr. Cr.			-0.00280 (-0.306)	0.00518 (0.579)	-0.00630 (-0.608)	-0.00166 (-0.160)
Curr Cr. [-1,-5]			-0.0394 (-1.13)	-0.0449* (-1.72)	-0.0460 (-1.16)	-0.0481 (-1.51)
Curr Cr. [-1,-3]			-0.0385* (-1.77)	-0.0441*** (-2.82)	-0.0428* (-1.92)	-0.0449*** (-2.66)
BK Cr.			0.0203** (2.288)	0.0248*** (2.943)	0.0359** (2.256)	0.0498*** (3.285)
BK Cr. [-1,-5]			-0.0300** (-2.34)	-0.0241 (-1.25)	-0.0209 (-0.68)	-0.0184 (-0.58)
BK Cr. [-1,-3]			-0.0309*** (-3.56)	-0.0284*** (-4.06)	-0.0310*** (-3.16)	-0.0323*** (-3.15)
Observations	215	215	210	210	210	210
R-squared	0.456	0.369	0.543	0.507	0.549	0.524
Number of countries	12	12	12	12	12	12

Robust t-statistics in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Instruments: Lagged (2nd and 3rd) values of capital-output ratio (in log) Curr. Cr.: Currency crises; BK1: Systemic and non-systemic banking crises; BK2: Systemic banking crises. Labour share: Sylvain (2007). Curr Cr. [-1,-5]: Linear combination of coefficients (Curr. Cr. -1 + ... + Curr. Cr. -5). BK Cr. [-1,-5]: Linear combination of coefficients (BK Cr. -1 + ... + BK. Cr. -5).

## 5 Conclusion

In this paper, we have studied the linkages between financial crises and the labour share. Overall, we have found a strong negative effect of currency crises on the labour share. The labour share decreases on average by 2% in the three years following a crisis. This result is confirmed while controlling for unobserved country characteristics and for a time trend. The intuition is the following: the incentive to delocate capital tends to increase capital bargaining power and thus

its relative income share. On the contrary, governmental spending tends to protect workers and thus reinforce their bargaining power and income share.

If, according to traditional views, the labour share is expected to be stable over time, a growing number of authors have contested this idea, suggesting various factors which can explain a decreasing share of labour within the national income. Here , we find a negative trend at the world level , while controlling for all other possible determinants of the labour share.

Concerning the impact of banking crises, the conclusions which can be drawn are less clear-cut. We only observe a positive impact on the labour share the year of the crisis, suggesting that banking crises primarily affect capital income. However, the effect is not significant the following years, indicating a lack of redistributive impact. However, this does not mean that labour is not negatively affected by banking crises. As banking crises have a strong negative impact on GDP, the labour income will also be affected. The results are slightly different for OECD countries. Systemic banking crises seem to have a strong positive impact the year of the crisis , but a negative impact the following years. Lower returns on capital may be transferred to the banking system and may be one way of explaining how a banking crisis starts. After the crisis, a direct cost on the investors may be offset by a lower bargaining power for workers.

Concerning the current financial crisis, it is too early to estimate the effects on the labour share. The current crisis is much broader than a single currency or even banking crisis. The effects on the bargaining power may also differ, mainly because of the worldwide characteristics of the crisis. The stake for States is to maintain their social protection mechanisms in order to minimise the social consequences of this crisis. If not, the consequences in terms of inequality may be very significant.

## Annex

## A Countries Included in the Sample

Argentina, Australia, Austria, Belgium, Benin, Burkina Faso, Bolivia, Brazil, Canada, Chile, Cote d'Ivoire, Colombia, Costa Rica, Denmark, Algeria, Ecuador, Egypt, Arab Rep., Spain, Finland, France, United Kingdom, Greece, India, Iceland, Israel, Italy, Japan, Kenya, Sri Lanka, Mexico, Netherlands, Norway, New Zealand, Panama, Peru, Philippines, Portugal, Sweden, Thailand, Tunisia, United States, Venezuela, RB, South Africa, Zimbabwe

## B Definition of Variables

Variable	Description	Source
Labour Share	compensation paid to resident and non-resident households (in % of GDP)	UN National account, Sylvain (2007)
Capital - Output ratio	Ratio Capital/Output (in log)	PWT 6.3 and WDI
GDP per cap.	GDP per capita (in log)	PWT 6.3
Trade	$\frac{X+M}{GDP}$	WDI
FDI in	Inflows of FDI (in log)	WDI
FDI iyt	Outflows of FDI (in log)	WDI
Gvt. Spend	Government spending (in % of GDP and in log)	WDI
Curr. cr.	Currency crisis	Eichengreen & Bordo (2002), Berman (2008)
BK1	Systemic and non-systemic banking crisis	Caprio and Klingebiel (2002)
BK2	Systemic banking crisis	Caprio and Klingebiel (2002)

Note: PWT (Penn World Tables), WDI (World Development Indicators, World Bank)

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