Who bears the cost of currency crises?

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abstract: This paper focuses on the impact of financial crises on the labor share of income. Since crises usually lead to sharp output losses, studying labor share movements during those periods allows us to understand which factor bears the cost of financial crisis. Intuition suggests that financial turbulence, which is associated with high capital mobility, large factor reallocation and capital outflow, should, following Rodrik type arguments, lead to factor share disturbances. After summarizing several arguments, many in favor of a decrease in the labor share during a crisis, we test such a claim on a panel of 20 countries which have experienced many crises episodes. We find that crises seem to be associated with a clear decrease in the labor share. Results are robust to various controls and various kind of crises. Moreover we were able to discriminate between various possible explanations.

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1 Introduction

Many countries, mainly emerging ones, have experienced several financial crises in the last decades. This gave birth to numerous studies, which we will briefly present, on the causes of financial crises . Surprisingly economists have paid little attention to the consequences of financial crises, at least on the distributional ones[1]. However, that financial crises affects poverty and inequality is difficult to deny (see Fallon and Lucas (2002) or Baldacci et al. (2002)).

In this paper we aim at looking at the distributional impact of financial crises in a specific way which is the factor income distribution. As financial crises hurt output, we want to see which of the two factors, namely labor and capital, bears the cost. Understanding which of the two factor bears the cost of financial crises also allows to predict the distributional impact of the crisis on personal income since low labour shares are associated with high inequality (see Daudey and García-Penalosa (2007)). To our knowledge, the only work dealing with the impact of financial crises on the factor income distribution is the one of Diwan (1999) showing that the labor share usually sharply falls after a financial crisis [2]. However the mainly descriptive aspect of his work led us to investigate further the relationship between financial crisis and the labor share. Indeed, Diwan (1999) suggests that it is labor which bears the cost of financial crises because capital mobility shifts the balance of power relations in favor of capital, but this interpretation is in a sense quite speculative. Here we try to investigate other channels and also provide some theoretical background. Furthermore, we work on disaggregated data which allows us not only to benefit from more observations, but also to check whether the observed decline of the labor share could not be simply the result of sectoral reallocation effects. Moreover, we choose a different financial crisis criterion : while the one of Diwan is based on the belief that "one size fits all", we define financial crisis following Kaminsky and Reinhart (1999) Kaminsky (2006) where the variations of reserve are included.

Let us recall that in the theoretical literature, there are roughly speaking three generations of models which aim to explain the causes of currency crises. The first generation of models, based on the seminal work of Krugman (1979), shows that crises are due to persistent imbalances financed by monetary creation which conflict with limited amount of reserves [3]: parity of exchange rate is no longer defendable and foreign investors disengage because they expect the ineluctable depreciation of currency . Crises are qualified as standard in these kinds of models. The second generation tries to explain financial crises which occur in an environment where there is no imbalances and good fundamentals, see Obstfeld (1986), Obstfeld (1994) andObstfeld (1996).). Here the currency crisis results from speculative attacks and mainly concerns developed economies. The third generation of models, related to tequila crisis (1994) and the Asiatic one, is more devoted to explain crises in emerging economies. Here currency crises are linked with banking fragilities and imperfect information on financial markets. The so-called twin crises Kaminsky and Reinhart (1999) are a characteristic feature of the crises of the 80's and of the 90's.

The extended empirical work of Kaminsky (2006) where 18 variables are collected to identify 96 crises,

[1] There are however some specific empirical studies on single countries (see for instance Lopez-Acevedo and Salinas (2000) for Mexico)

[2] Diwan (1999) defines financial crisis as a depreciation of the exchange rate greater than 25%, criterion inspired by Frankel and Rose (1996) who define currency crisis as a nominal depreciation of at least 25% that is also at least a 10% increase in the rate of depreciation

[3] see Mundell (1963) for the incompatibility of fixed exchange rate, capital mobility, and independent monetary policy

allows her to group them into 6 groups : domestic economic fragility, current account deterioration, fiscal imbalances, financial excess, foreign debt unsustainability, second stop, and self-fulfilling crises. She argues that while the theoretical literature puts the stress on the diversity of crises, the empirical works on financial crises assume the 'one size fit all'. We choose to identify crises as Kaminsky (2006) does in order to have a richer criterion than the one of nominal exchange rate depreciation, and also in a second step to see whether the distributional impact of financial crises differ according to the type of crises.

We follow Kaminsky and Reinhart (1999) and Kaminsky (2006) who construct a crisis index in the spirit of Eichengreen et al. (1996) . We compare their indicator with respect to others in the literature to justify our choice.

The first attempt to characterize currency crises is the one of Frankel and Rose (1996) . They define a currency crisis as a nominal exchange rate depreciation greater than 25%, provided that this depreciation is greater of 10% of the former one. Diwan (1999) simply defines a crisis as a depreciation greater that 25%.

The main problem with the Frankel and Rose and Diwan indicators is that crises episodes could simply reflect high inflation rate periods. Increase in exchange rate (defined as the number of currency for one dollar) is commonplace for economies in flexible exchange rates regimes. Hence these criterions are likely to capture an inflation phenomena rather than financial turbulence. An other problem is that exchange rate is not the only variable which characterizes financial distress. This is the reason why we adopt the Kaminsky and Reinhart criterion which includes reserve variations. The index is a weighted average of the rate of change of the exchange rate $\frac{\Delta e}{e}$ and of reserves $\frac{\Delta R}{R}$. Formally the index is :

$$I = \frac{\Delta e}{e} - \frac{\sigma_e}{\sigma_R}\frac{\Delta R}{R},$$

where σ_e is the standard deviation of the exchange rateand σ_R. σ_e/σ_R stands for the weights of the average and allow the index I to be such that its two components have equal volatilities. When the index takes a value greater than three standard deviation above the mean (on monthly data), the observation is considered as a crisis observation. To deal with high inflation countries, Kaminsky and Reinhart (1999) divide their sample into two groups, the high inflation one (Inflation rate higher than 150 percent in the six previous month) and low inflation one and apply the criteria on each group.

Considering reserves is very important in our case. Indeed, investors can anticipate the devaluation which finally do not occur or attempt a speculative attack without any success. Is this case the impact on the labor share would be the same as if the devaluation had occurred since investors get out. The Kaminsky and Reinhart (1999) criteria by taking into account the variation of the reserves allow us to appraise this phenomena of capital outflows. In other words it is more the anticipation of the devaluation than the devaluation itself that matters.

Furthermore, notice that Frankel and Rose's criterion has been constructed for emerging economies and its ability to identify crises in developed countries is poor. In these economies, devaluations are often less than 25 percent whereas reserves variations are important.

The rest of the paper is organized as follows: section 2 presents the theoretical explanations of the determinants of the labor share, and then allows us to present the different channels through which

financial crisis could impact the labor share. Section 3 is devoted to appraise the empirical link between financial crises and the labor share. Section 4 concludes.

2 The Model

In this section we present a model highliting different chanels through which currency crises may have an impact on the aggregate labor share. The aim of this section is not explaining the raison why a currency crisis can occur but decribe what are the impacts on the labor share taking it as exogenous. We first present the basic model structures mainly based on Dutt and al (2009) changing several assumptions and derive the labor share. We then describe what happens during financial crises in term of reallocation of factors and in term of bargaining strenght. Before starting the presentation of the theoretical model, we briefly discribe what happens to macroeconomic aggregates during a currency crisis.

2.1 The macroeconomic background of the crisis

In this subsection we present some stylised fact mainly from Kaminsky and Reinhart (1999) concerning what happen to main macreconomic aggregates during a currency crisis. The main features of the thoeretical model presented bellow is compatible with such a facts.

Kaminsky and Reinhart (1999) compares several macroeconomic aggregate during currency crisis episodes compared to peacfull times. The period of financial turbulance is defined as a period of 18 mo,th before the crisis occurs and 18 month after. The first variable of interest is the exchange rate that change the relative price of tradble and non radable goods. Kaminsky and Reinhart show that during the 18 month prior crisis occurs, the real exchange rate 20% overvalued relative to trend and is stable. Just after currency crisis occur, real exchange rate remain 10% undervalued relative to trend and is stable over the 18 month following the crisis. As a result export underperform prior currency crisis occurs and reach abysmal performances after crisis occur suggesting important reallocation of factors in the tradable sectors.

Concerning quantities of capital available in the economy, several indicators in Kaminsky and Reinhart (1999) tend to suggest a sharp decrease in the funds available in the economy in order to finance firms investments. First of all, we focus on the bank deposit. The bank deposits is closed to normal (but slightly less) during the 18 month prior the crisis and decrease a lot as the crisis occurs to reach -15% compared to peaceful periods. Deposits only recovers 18 month after the crisis occur that K&R interpret as massive and persistant capital flight. As a result the ratio of demestic credit to GDP ten point higher than peacful times drop to be 5 lower 9 month after crisis occur. Lending-Deposit rate ratio increases by a lot after a crisis that K&R interpret as a deterioration in credit risk. Growth rate (in annual rate) of reserves remain 60 points below tranquile time period at the time of crisis and remain 20 points lower 9 months following the depreciation suggesting important capital flights. Finally the stock price drop from usual level to 40% lower than peaceful period as crisis occur and remain 20% lower 12 month after crisis occurs.

The last indicator we observed is the variation of aggregate output repported in Kaminsky (2006). The mean growth rate of aggregate output is -2.9% the year the crisis occurs and -0.7% the year after. Hence the cost of financial crisis is very high for society. Once can note that, as noted by K&R (1999) and Kaminsky (2006), currency crisis associated with financial excess or associated with banking crisis (twin crisis) are much more severe. In those cases the decrease of GDP reach 3.8%.

We now turn to the basic model that must incorporate those features: that is capital scarcity following crisis (and an increase in interest rate), an important depreciation of currency in nominal as well as in real terms and, a drop in output. We considere crisis as exogenous and focus on the possible consequences for the labor share having in mind its macroeconomics effets.

2.2 The basic model

2.2.1 Production and demand structure

We assume that a final non tradable good Z is produced under perfect competition using two intermediate inputs X that is tradable and Y that is no tradable. Production function of Z is

$$Z = \frac{AX^{1-\alpha}Y^{\alpha}}{\alpha^{\alpha}(1-\alpha)^{1-\alpha}} \tag{1}$$

We assume that Z is the numeraire and its normalised to one. We obtain the cost function

$$\frac{1}{A}(p_x)^{1-\alpha}(p_y)^{\alpha} = 1 \tag{2}$$

We can write the relative demand function for the two goods $\frac{X^d}{Y^d} = \frac{(1-\alpha)p_y}{\alpha p_x}$. We make the very simple assumption that as a foreign demand component we can write the totale relative demand for the country i as

$$\left(\frac{X}{Y}\right)^d = f\left(p, e\right) \ \ with \ f'_p < 0, f'_e > 0 \tag{3}$$

Where $p = p_x/p_y$ and e is the exchange rate define as how much of lacal currency needed to have on dollard. The depreciation of exchange rate shift relative demande of good X to the left.

In the basic set up, we assume that both intermediate goods are produced using to factors, labor L and capital K, with cobb douglas technologies. Per capita productions function are $x = A_x k_x^{\phi_x}$ and $y = A_y k_y^{\phi_y}$.Total production in each sector is $X = A_x(1-u_x)L_x k_x^{\phi_x}$ and $Y = A_y(1-u_y)L_y k_y^{\phi_y}$ where u_i stand for unemployment rate in sector i and A_i is a total factor productivity term. Labor is allocated across the two sectors

$$L_x + L_y = L \tag{4}$$

And the market clearing condition for capital is

$$(1-u_x)L_x k_x + (1-u_y)L_y k_y = K \tag{5}$$

In the model, the total quantities of factors is exogenous but allocation across sectors is endogenous as so the interest rate. We can deduce from production function, sectoral conditions for capital accumulation

$$p_i A_i \phi_i k_i^{\phi_i - 1} = r \tag{6}$$

Hence, the relative offer of good X

$$\frac{X^s}{Y^s} = \frac{A_x(1-u_x)L_x k_x^{\phi_x}}{A_y(1-u_y)L_y k_y^{\phi_y}} \tag{7}$$

We can now turn to labor market

2.2.2 The labor market

To introduce departure of wages from marginal product and make it possible for the labor share to change within sectors, we assume that labor market are characterized by frictions. We assume each firms is endowed with a single job slot and can search for a job after paying an entry cost corresponding to regulation on the good market. This is a shadow cost as in Blanchard and Giavazzi (2003). The reason why we assume such an entry cost instead of classical search cost to generate surplus for a match is that shadow cost a la Balchard and Giavazzi are not cost in ressources and have not to be deduced from output. This makes computation of the labor share easier. But this assumption does not change the nature of results.

We denote $\theta_i = \frac{v_i}{u_i}$ the tension in sectors i and assume a segmented labor market. Each worker can search in one sector. We assume a cobb douglas matching function that gives the number of match

$$M_i(v_i L_i, u_i L_i) = m_i v_i^{\gamma} u_i^{1-\gamma} L_i = m_i \theta_i^{\gamma} u_i L_i \tag{8}$$

The exit rate from unemployment is $\frac{M_i}{u_i L_i} = m_i \theta_i^{\gamma}$ and the rate at which vacancies are filled is $\frac{M_i}{v_i L_i} = m_i \theta_i^{\gamma-1}$. The match are destroyed at rate λ_i and the dynamic of unemployment can be written

$$\dot{u} = \lambda_i(1-u_i) - m_i \theta_i^{\gamma} u_i \tag{9}$$

At steady state, $\dot{u} = 0$ that gives the beveridge curve that links tension and unemployment

$$u_i = \frac{\lambda_i}{\lambda_i + m_i \theta_i^{\gamma}} \tag{10}$$

We can write the flow value of a vacant job V_i

$$\rho V_i = m_i \theta_i^{\gamma-1}(J_i - V_i) \tag{11}$$

The shadow entry cost is χ_i and at equilibrium, with free entry condition, the value of a vacant job must be $V_i = \chi_i$. That gives the equilibrium value of an occupied job

$$J_i = \frac{\rho \chi_i}{m_i \theta_i^{\gamma-1}} + \chi_i \tag{12}$$

The flow value of an occupied job can be written as

$$\rho J_i = p_i A_i k_i^{\phi_i} - r k_i - w_i - \lambda_i J_i \tag{13}$$

which can be rewritten as the job creation condition

$$p_i A_i k_i^{\phi_i} - r k_i - w_i = (\rho + \lambda_i)(\frac{\rho \chi_i}{m_i \theta_i^{\gamma-1}} + \chi_i) \tag{14}$$

We can now determine wages. First of all, we can writte the flow value of an unemployed position U_i and a worker position W_i in sector i respectively

$$\rho U_i = B + m_i \theta_i^{\gamma}(W_i - U_i) \tag{15}$$

$$\rho W_i = w_i + \lambda_i(U_i - W_i) \tag{16}$$

Where B is the flow income of being unemployed

Wages maximise the nash solution

$$w_i = \max_{w_i} \arg (W_i - U_i)^{\beta}(J_i - V_i)^{(1-\beta)} \tag{17}$$

Which gives by replacing $V_i = \chi_i$ the well known solution $W_i - U_i = \frac{\beta}{1-\beta}[J_i - \chi_i]$. Then we can easily derive an expression for a position of unemployed and for wages

$$\rho U_i = B + \frac{\beta}{1-\beta} \rho \chi_i \theta_i \tag{18}$$

By using J_i, W_i, et ρU_i in the nash solution to obtain the wage curve

$$w_i = (1-\beta)B + \beta(p_i A_i k_i^{\phi_i} - r k_i + \rho \chi_i \theta_i) \tag{19}$$

And by using the value of an occupied job J_i we can writte the wage

$$w_i = B + \frac{\beta}{1-\beta}(\rho \chi_i \theta_i + (\rho + \lambda_i)(\frac{\rho \chi_i}{m_i \theta_i^{\gamma-1}} + \chi_i)) \tag{20}$$

We can now characterized equilibrium

2.2.3 Equilibrium

In this section we define equilibrium. First of all, we assume that workers should be indifferent in searching in one sector or the other. Then the equilibrium value of an unemployed position is the same across sector. Then, $U_x = U_y$. We assume that entry cost are the same across sectors $\chi_x = \chi_y$ and as B is the same across sectors we can deduce from (18) $\theta_x = \theta_y = \theta$. We also assume $m_x = m_y$ and $\lambda_x = \lambda_y$. Hence, the only sources of heterogeneity across sector is for factor intensity. Then, from (20), $w_x = w_y$.

We can deduce from (14 or 19) that at equilibrium

$$p_x A_x k_x^{\phi_x} - r k_x = p_y A_y k_y^{\phi_y} - r k_y \tag{21}$$

Or$(1 - \phi_x) p_x A_x k_x^{\phi_x} = (1 - \phi_y) p_y A_y k_y^{\phi_y}$

Equilibrium is obtain as follow. We start with a given relative price p. Equilibrium value for variables $w_i^*, r^*, \theta_i^*, u_i^*, L_i^*, k_i^*$ are determined through equations (4), (5), (6), (10), (14), (19) and the fact that at equilibrium $\theta_x = \theta_y$. It is difficult to find an analytical solution for tension implicitely define by (14) and (19).

But it's possible to obtain a solution for sectoral capital intensities as a function of relative prices from equation (6) (14) (19) and (20)

$$k_x^* = \left(\frac{\phi_y}{\phi_x}\right)^{\frac{\phi_y}{\phi_x-\phi_y}} \left(\frac{1-\phi_x}{1-\phi_y}\right)^{\frac{\phi_y-1}{\phi_x-\phi_y}} \left(\frac{A_x p_x}{A_y p_y}\right)^{\frac{1}{\phi_y-\phi_x}} \tag{22}$$

$$k_y^* = \left(\frac{\phi_y}{\phi_x}\right)^{\frac{\phi_x}{\phi_x-\phi_y}} \left(\frac{1-\phi_x}{1-\phi_y}\right)^{\frac{\phi_x-1}{\phi_x-\phi_y}} \left(\frac{A_x p_x}{A_y p_y}\right)^{\frac{1}{\phi_y-\phi_x}} \tag{23}$$

Assuming (without any implication for the rest of the paper) that sector X is capital intensive. That is $\phi_x > \phi_y$. Then an increase in p decrease the capital intensity of both sectors. Intuitively an increase in p leads to rellocation of labor from sector Y to sector X.As sector X is capital intensive, requierement of capital from sector X is to high with respect of the quantities available from sector Y. Hence capital intensities has to adjust to clear the market. Furthemore from (2) an increase in p_x imply a decrease in p_y and from (6) an increase in r. This is the standard Rybzinsky theorem

Finally, it's easy to show the relative supply curve increase in p.

We can now derive the labor share of income

2.2.4 The labor share of income

We can now derive the labor share of income. Labor share is derive as total wage bill over value added. Note that entry cost have not to be deduced from output due to our assumption of shadow cost induced by reglementation on the good market or other barriers. Labor share in sector i is

$$LS_i = \frac{(1-\beta)B + \beta(p_i A_i k_i^{\phi_i} - r k_i + \rho \chi_i \theta_i)}{p_i A_i k_i^{\phi_i}} \tag{24}$$

As noted in Pissarides (2000) chap 1, it's important that flow income of an unemployed and entry cost (or seach cost) be proportionnal to productivity. If it were not the case, unemployment rate would depend on development level which is not a satisfying properties of an equilibrium unemployment model. Hence we assume $B = bw_i$ were b is the replacement rate. For entry cost, we assume that it's proportionnal to the surplus over which wages are bargained. $\chi_i = c_i(1-\phi_i)p_i A_i k_i^{\phi_i}$ with $c_x = c_y$ such that $\chi_x = \chi_y$ continu to hold.

We can rewrite the labor share

$$LS_i = (1-\phi_i)\left[\beta/(1-(1-\beta)b)\right]\left[1 + c\rho\theta\right] \tag{25}$$

Due to our assumption that θ, m and λ are the same across sector, we can deduce from the beveridge curve (10) that unemployment rate is the same across sectors. We can then write the aggregate labor

share

$$LS = [\pi(1-\phi_x) + (1-\pi)(1-\phi_y)]\,[\beta/(1-(1-\beta)b)]\,[1+c\rho\theta] \tag{26}$$

Where $\pi = L_x/L$. Hence aggregate labor share depend on the technology in sectors weighted by the share of each sector in the total labor force. Aggregate labor share depend also on the bargaining power β of workers, on replacement rate and entry cost.

We have now characterized all our central relations in the basic model.We can now turn to the impact of currency crises on the labor share.

2.3 Currency crises and the labor share.

In this section, we examine the impact of currency crises on the labor share of income. We distinguish between two kind of effects. First of all financial crises is generally followed by reallocation of factors across sectors due to capital outflow and exchange rate depretiation. We show that if sectors have different capital intensities, those factor reallocation make aggregate labor share change. We then turn to the impact of financial turbulance and currency crises on the wage setting in a firm and deduce impact for labor share within sectors.

2.3.1 Reallocation effects

We show that crises may leads to two opposite reallocation of factors across the two sectors in the economy.Then, the impact on the aggregate labor share is ambiguous.

First of all we show that due to our assumption $B = bw_i$ and $\chi_i = c_i(1-\phi_i)p_iA_ik_i^{\phi_i}$ tension θ are not affected by productivity in sectors and depend only on the parameters of the model. By replacing in the job creation curve (14) and the wage curve (19) we obtain

$$1 - \frac{\beta}{1-(1-\beta)b}(1+\rho c\theta) = (\rho+\lambda)\left(\frac{\rho c}{m\theta^{\gamma-1}} + c\right) \tag{27}$$

Hence unemployment rate does not depend on the productivity in a sector. Then wage and productivity move proportionaly and the labor share is nor affected by productivity movment in sectors. This is a satisfying property of the labor which is to be quite stable over the long run.

We now derive now write the market clearing condition for capital (using the results that $u_x = u_y$)

$$\pi k_x + (1-\pi)k_y = \frac{K}{L(1-u)} \tag{28}$$

First we study the impact of a depreciation of the exchange rate. From (3) and (7), a depreciation make relative demand curve shift to the right making relative price increase.

Proposition 1. *The increase in the relative price of good X makes the share π of sector X increase. If sector X is capital intensive, it makes the aggregate labor share decreases and if sector os labor intensive, aggregate labor share increase.*

Proof. If $\phi_x > \phi_y$,from (23) and (24), an increase in p make capital intensities in each sectors decreases. We know that unemployment in each sector is not affected by productivity. Hence the right hand side of

(28) is unaffected. At constant π the left hand side of (28) decrease. if we assume no reversal in capital intensity, as $k_x > k_y$, π must increase for (28) continue to hold. Then it's obvious to show that as θ remain unaffected, $\partial LS/\partial e = (\partial \pi/\partial e)(\partial LS/\partial \pi) < 0$. The proof is the same for $\phi_x < \phi_y$ □

Note that price adjustment could take time as so reallocation across sectors.

Let's now turn to the impact of suddent dtop in capital inflow or, capital outflow that caracterize many currency crises. Firms are not able to finance its investment anymore and aggregate capital stock can decrease. What's is the impact of such a change in the dotation of the economy. Contrary to the depeciation that lead to a decrease or an increase in the labor share depending on the relative factor intensity of the tradable sector, capital outflow lead to an increase in labor share in both case.

Proposition 2. *The decrease of capital stock make the share π of the labor intensive sector increase. This unambigiously increases the aggregate labor share.*

Proof. Lets start with constant prices. If $\phi_x > \phi_y$, $k_x > k_y$. As right hand side of (28) decrease, π the share of capital intensive sector have to decrease. Then, this shift the relative offer curve to the left decreasing p. From (23) and (24), this lead to an increase in capital intensities in both sectors. From (28) this one time again decrease π as $k_x > k_y$. As θ remain unaffected, $\partial LS/\partial K = (\partial \pi/\partial K)(\partial LS/\partial \pi) > 0$. The proof is the same for $\phi_x < \phi_y$. □

We have shown that if $\phi_x > \phi_y$ that is, the tradable sector is capital intensive the two reallocations impact on the labor share goes in opposite direction. If $\phi_x < \phi_y$, both reallocations impact on the labor share goes in the same direction and the aggregate labor share should increase.

We can turn to the impact of currency crises inside each sectors trough the negociation channel.

2.3.2 Intrasectorial variation in the labor share

In this subsection we explore different class of arguments that could explain movment in the labor share within sectors following a crisis. Our arguments hinge on the fact the outiside opportunities of capital are global whereas those of labor are only local. When local opportunities of capital shrink with those of labor world opportunities remain unchanged or can increase. Then it pressures wages down and make labor share decrease. In this section we considère variation of wages at given output. That is variation in wages lead to a proportional variation in the labor share.

· Very often, following a currency crisis, IMF have imposed during the 80's and the 90's to countries, the so called structural adjustment plan. The goal of those programmes was to reduce internal demand in order to equilibrate current account. Adjustement programs very often consist in reducing public spending and as a result, sharp cut occured in social security net. The immdiate impact in term of our model is a decrease in b. It's easy to check that the direct impact of b on the labor share overcompensate the indirect positive impact on θ that make labor share increase. This a standard results of the matching litterature. Hence labor within sectors should decrease.

· Many currency crises such as the sudden stop crises results from an important shock in the world capital return as argued by calvo (1995) or Kaminsky and Reinhart (1999). If capital have the possibility to reallocate easily at low cost it should hurt labor in the bargaining over the surplus generated by a match.

Until adjustment occurs, the new maximisation program if capital owners have acess to international capital market

$$w_i = \max_{w_i} \arg (W_i - U_i)^{\beta} (J_i - V_i - I)^{(1-\beta)} \tag{29}$$

It's easy to show that $\partial w / \partial I < 0$. This impact should deseapear as crisis equalize local returns with international one.

· An other arguments hinge on the fact that if shareholders are foreigners and invested in firms before crises occur, the return of investment is the share of surplus negociated in local currency over the amount invested in dollars liability. Then the depreciation reduce the return of investors that invest before the depreciation.occurs that could have an impact in the bargaining process in order to satisfy foreign investors. The bargaining process can be modelized as

$$w_i = \max_{w_i} \arg (W_i - U_i)^{\beta} (1/e(J_i - V_i) - I)^{(1-\beta)} \tag{30}$$

· Finally, many crises results in financial excess and a boom in credits as noted by Chang and Velasco (2001) or Kaminsky and Reinhart (1999). Generally, during those periods of financial excess, loan was performed in dollars and firms are linked by contract with banks and lenders. That increase repayment charges d and reduce the surplus over which wages are bargained. That shift the job creation condition in the (θ, w) space that make tension on the labor market θ decreases. Those two effects lead to a lower negociated wage at constant output. After crises, government often increase taxes (t) to balance budgets and assume its financial obligations. The effect is the same.

$$\rho J_i = p_i A_i k_i^{\phi_i} - r k_i - w_i - t - d - \lambda_i J_i \tag{31}$$

Reduction of the value of an ocupied job leads to a decrease in negociated wages and an increase in tightness that one time again reduce negociated wage. Those effect deseapears as soon as loans are repayed and new loan renegociated.

2.3.3 The case of wage rigidity

In previous section we have assumed wages are renegociated each periods and can adjust quickly. In some countries, wages could not adjust due to long term contract, insider-outsider phenomena in the bargaining process or minimum wages for exemples. We show in this section that if wages are perfectly rigid, crisis make labor share increase within sectors and the adjustment occur through unemployment.

Considere a rigid wage $\bar{w}$. In this case the model is really easy to solve. Consider the job creation condition and, in order to simplify analysis, we considere sectors have the capital intensity. Hence $p_x A_x k_x^{\phi_x} = p_y A_y k_y^{\phi_y} = pAk^{\phi}$. Be dividing this condition by total output pe worker pAk^{ϕ} we obtain.

$$(1 - \phi) - \left(\frac{\bar{w}}{pAk^{\phi}} \right) = (\rho + \lambda_i)(\frac{\rho(1-\phi)c}{m_i \theta_i^{\gamma - 1}} + (1 - \phi)c) \tag{32}$$

Proposition 3. *Considère a decrease in productivity originated from capital outflow reducing pAk^{ϕ}. This make the labor share within sector increases.*

Proof. Given θ, it makes the labor share $\frac{\bar{w}}{pAk^{\phi}}$ increases. To make the equality hold θ has to decrease to make the right hand side of (32) decreases. As the righ hand side decreases, the left handside increase du to the fact that capital per worker increase. The process continu until reaching a fixed point. At equilibrium labor share is higher as θ is lower than initial situation. □

Hence, in cases of high wage rigidities, there is a room for an increase in the labor share within sectors, following a crisis.

2.3.4 The role of technology

In previous sections, we assume cobb douglas technologies in both sector. Hence capital accumulation does not change the share of output over which wages are bargained or in other world, the rechnological capital share $(1-\phi_i)p_iA_ik_i^{\phi_i}$. And as θ does not depend on productivity, labor share does not change with capital accumulation. We now assume a more general production function $f(k)$.

In a more general technologie the share of output over which wages are bargained is, Instead of $(1-\phi_i)$

$$LS = 1 - \alpha(k)$$

where $\alpha(k) = kf'(k)/k$. Difining the elsaticity of substitution between capital and labor $\sigma = (dk/k)/(d\omega/\omega)$ where ω is the competitive relative cost of factor it's easy to show that

$$\alpha'(k) = \frac{\alpha(1-\alpha)}{k\sigma(k)}\left[1-\sigma(k)\right]$$

We can then write the labor share with a more general technology keeping our assumption that $B = bw$ and $\chi_i = c_i(1-\alpha(k))p_iA_if(k_i)$

$$LS_i = (1-\alpha_i(k_i))\left[\beta/(1-(1-\beta)b)\right]\left[1+c\rho\theta\right]$$

This expression is very similar to the cobb douglas case. As before, tension depend only on parameters of the model and is unaffected by per capita income k.

Hence, within sector labor share can be affected by factor accumulation through technological determinant. Typically, a decrease in capital stock resulting from a currency crisis may affect the labor share through technological determinants depending of the elasticity of substitution between capital and labor[4].

[4]There is no consensus in the litterature concerning the value of the elsaticity of substitution. Duffy and Papageorgiou (2000) estimates an elasticity of substitution lower than one for developing countries and higher than one for developed countries. For Hammermesh (1993) factors are more complement and estimates an elasticity of substitution lower than one. In this case, a lower capital stock should decrease labor share

3 Empirical analysis

3.1 Empirical Strategy

In the theoretical model, we have shown that currency crises can affect the labor share trough two different ways. On the one hand a currency crisis can affect the structure of the economy through reallocation of factors across sectors which differ in their labor share level. On the other hand, the currency crisis can affect the labor share within each sector of the economy.

After having described precisely the data we use to compute the labor share of income, and recalling that we use the sample of Kaminsky (2006) who identifies crises episodes for 20 countries, we will first perform a decomposition of the variation of the labor share in the manufacturing sector into a within and a between term. This will allow us to roughly grasp the link between currency crisis and the labor share and to present the intuition that the variation of the labor share, which reveals to be negative in most of the cases, mainly comes from variations within sectors.

Then we turn to econometrics to ensure that sectoral reallocations forces which can be at stake during currency crises episodes do not explain the variation of the labor share.

Basically, our empirical analysis consists in estimating a reduced form equation on panel data whose dependant variable is the labor share and where our regressor of interest is a currency crisis dummy. Of course, we will use as controls a set of determinants of the labor share, some of them being potentially correlated to crises.

First of all, we obviously need to control for capital accumulation since it is the only determinant of the labor share when factors are paid their marginal product. Moreover it allows us to test for the technological channel of financial crises highlighted in the theoretical model in the case where production functions are not Cobb Douglas.

We use as a proxy of capital accumulation the ratio of investment to value added for the manufacturing sector (I/Y available in the UNIDO dataset).

We also add an education variable to control for human capital accumulation since the labor share depends on human capital in a three factors non Cobb Douglas production. This means that within sectors, human capital accumulation can change the labor share as physical capital accumulation when we depart from a 2 factor production where labor and capital are perfect substitutes. Moreover there is empirical evidence of a positive link between education and the labor share, at least for OECD countries, see Daudey and Decreuse (2006).

The second kind of control variables we use, namely trade and openness, are related to globalization. As mentioned above, various studies have shown that those variables are negatively correlated to the labor share, see Rodrik (1997), Harrison (2002), Jayadev (2007) andOrtega and Rodriguez (2002). Moreover, notice that Kaminsky and Reinhart (1999) show that many of the crises occur a couple of year after financial liberalization in their sample. Therefore, omitting openness variables would create endogeneity problems.

In a first step we will estimate this relation in level on aggregate data. This will allow us to compare our results to the ones of Diwan (2001) andDiwan (2002), although he works on UN data and does not

control for country heterogeneity which we do [5].

In a second step we turn to sectoral data which allow us to control for unobserved heterogeneity across sectors, and also to dispose of more data.

Finally, we perform estimations in difference in order to distinguish between intra sectoral variations of the labor share and reallocation effects. We first estimate differentiated equation at the aggregate level and then turn to sectoral data in order to understand what is the share of the variation at the aggregate level explained by within sector variation of the labor share.

3.2 Data

Our variable of interest is the labor share of income and we compute it using the UNIDO database which covers 180 countries over the period 1963-2003. This database provides various variables at the aggregate manufacturing level, as well as at 3 digit level such that 28 sub sectors are described (see appendix). The UNIDO data mainly comes from industrial surveys which are sent by UNIDO to the country statistical offices[6]. The labor share is defined as the ratio of wages and salaries over value added[7]. The main problem which could occur, as underlined by Gollin (2002) , is that, with this simple definition, all the income of the self-employed is treated as capital income, which leads to underestimate the labor share. This is particularly problematic in our study because it could bias the impact of financial crises. Indeed, during financial turbulence, many workers go back to the agricultural sector and/or become self-employed (see Fallon and Lucas (2002)). Hence, this could lead us to misinterpret a negative relationship between financial crisis and the labor share. Actually, using data from UNIDO allow us to avoid this self employed problem. Indeed, the surveys sent by UNIDO are designed to collect data only in the *corporate* manufacturing sector and specify a cut-off point below which economic activity is not measured. The cutoff can change between countries, but for example in developing countries, industries with less than five employees are not covered, and in the US the requirement is that establishments must have at least one paid employee. This ensure us that unincorporated enterprises are very unlikely to form part of the database, and allow us to reasonably think that we have gotten rid of the self employed problem.

A major problem of the UNIDO datase is that the way in which the manufacturing sector is desegregated in sub sectors can change over time and countries. For instance in France in 1997, sector 301 and 302 are distinct but in 1998, sector 301 becomes the aggregation of 301 and 302. In our empiric work on the labor share decomposition, and later in the econometric part, we will simply drop the observation when this happens. Indeed, in this case an observed sectoral variation of the labor share over time could simply reflect the merge of two sectors. In the same spirit, we drop observations when the weighted sum of sectoral labor shares does not equal the aggregate one (very rare).

Moreover we dispose also of a panel dataset of 20 countries, 6 developed and 14 developing [8], which have experienced various currency crises in the sense of Kaminsky and Reinhart (1999) and Kaminsky (2006), over the 3 past decades.

[5] Controlling for country heterogeneity is important since crises are more likely to occur in developing countries where labor share have been shown to be substantially lower, see Ortega and Rodriguez (2006)

[6] The data are supplemented with national and international sources, and also with data collected by UNIDO staticiticians

[7] see Appendix for a more precise definition of these variables

[8] see appendix for the list of countries and how debeloping and developed are differentiated

Our final dataset has been constructed as follows. First we have computed the labor share and the investment-output ratio using the UNIDO database. Then we have merged the panel dataset used by Kaminsky (2006). In the sample of Kaminsky (2006), 96 crises are identified. The 20 countries which form part of the sample have been elected by Kaminsky (2006) because they present characteristics which can allow her to apply the financial crisis criteria of Kaminsky and Reinhart (1999). More precisely the selection of countries of Kaminsky and Reinhart (1999) to form part of the sample has been made on multiple criteria such as small open economies, with a fixed exchange rate, crawling peg or band through portions of the sample. Identifying crises in another configuration cannot allow to use the crisis index they have constructed. Therefore we have kept only these countries to define the database we work on. Note that since some observations are missing in the UNIDO database for some years, we do not observe the same number of crises in our dataset as in the sample of Kaminsky (2006)[9]. Finally our database identifies 82 crises episodes. More precisely 28 crises episodes are observed in the 6 developed countries we dispose of and 54 in the 14 developing ones.

Although Daudey and Decreuse (2006) empirically show a positive link between education and the labor share using the proportion of people attaining the tertiary education, we have chosen to use as a proxy of human capital the average number of formal schooling years received, on average, by adults over age 15 (see Barro and Lee (2000)). Indeed, this variable is more appropriate in our case since 14 out of 20 countries of our sample are developing. Data on schooling are available every five year and yearly data are constructed by linear interpolation.

We use as a proxy for trade openness the ratio of import plus export to GDP for the whole economy. Unfortunately, sectoral data on this this variable are difficult to obtain for developing countries which prevent us from enjoy having it at the sectoral level.

To measure financial openness we dispose of two indexes, one de jure and one de facto. Whereas the first one captures how policies are restrictive toward capital flows, the second one measures how much capital flow over borders. Our de jure financial openness is the continuous composite index of Chinn and Ito (2007) [10]. Our de facto financial index is the sum of total external assets and liabilities as a share of GDP which have been estimated by Lane and Milesi-Ferretti (2007) in their "EWNII" dataset. One could suggests to add institutional variables of the labor market institutions to control for bargaining strength that should have an impact on the labor share, see Checchi and García-Peñalosa (2008) However, we have chosen to omit it due to the lack of data for developing countries. Notice that since there is is no evidence of correlation between labor market institutions and the probability that a financial crisis occurs, omitting this variable should not create endogeneity problems.

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[9]For instance,the UNIDO datasset does not cover year 1986 for Brazil which prevent us from disposing of this country/year in our final dataset

[10]see appendix for construction

3.3 Decompositions

To get a first glimpse at the impact of financial crises on the labor share of income, we compute various variations in time of the aggregate labor share during crises episodes for each country/year crisis. In the rest of the paper i denotes for country, t for year and s for sector.

First of all, when crisis happens in t, we observe that the highest average variation of the aggregated labor share takes place between $t-1$ and $t+2$. Indeed, between $t-1$ and $t+2$ the aggregate labor share decrease on average by 2.9 percentage points while the decrease is of about 2.4 percentage points between $t-1$ and $t+1$, about 1.9 between t and $t+1$, and about 2.4 between t and $t+3$. Between $t-1$ and $t+3$ the variation is lower, -1.4, suggesting that labor share start to recover two year after the crisis occurs. Since the highest variation takes place between $t-1$ and $t+2$, we will then focus on this time period.

We can observe that about 72% of the country-year crises are marked by a decrease of the aggregate labor share. The distribution of the variations of the aggregate labor share is described in the following figure.

[Figure 1 about here.]

In a second step we perform a decomposition of this variation between a "within" term which capture the variations of the labor share within sectors, and a "between" term which captures how the variation of the aggregate labor share is explained by changes in the structure of the manufacturing sector. Performing this decomposition will allows us to roughly discriminate between the two effects in favor of the within one.

First of all, recall that the labor share in a country i at time t is the sum of the sectoral labor shares $LS_{i,t,s}$ weighted by the sectoral shares $\phi_{i,t,s} \equiv y_{i,t,s}/yi,t$:

$$LS_{i,t} = \sum_{s=1}^{n} \phi_{i,t,s} LS_{i,t,s}$$

We can decompose the variation of the labor share between $t+2$ and $t-1$ as follows:

$$LS_{i,t+2} - LS_{i,t-1} = \underbrace{\sum_{s=1}^{n} (LS_{i,t+2,s} - LS_{i,t-1,s})\phi_{i,t-1,s}}_{\text{within effect}} + \underbrace{\sum_{s=1}^{n} (\phi_{i,t+2,s} - \phi_{i,t-1,s}) LS_{i,t+2,s}}_{\text{composition effect}}$$

Two terms appear[11]. The first one represents the within effect and equals the sum of the variations of the labor share within each sector, weighted by the initial sector share. This corresponds to the "real variation" of the labor share which can be due to factor intensity changes or institutional determinants like the bargaining power of the workers. The second term corresponds to what we call the "composition effect" and equals the variation of the share of each sector in the economy, weighted by the arrival value of labor share. As we have already seen, this term exists because a change in the aggregate labor share does not reflect necessarily a change in the labor share within each sector but can also reflect a change in the composition of output.

[11] In an alternative decomposition, a third terms appears. See Appendix

Observing figure 1 and figure 2 can allow us to see that the distribution of the variation of the aggregate labor share and of the within effect term are similar : about 70% are negative, and the magnitude of the variations are similar.

[Figure 2 about here.]

As to the distribution of the between effect (composition effect) we can observe that it is clearly less important: see figure 3.

[Figure 3 about here.]

Finally, the following figure suggests that most of the observed variation of the labor share are within sectors variations, see figure 4.

[Figure 4 about here.]

3.4 Econometric Analysis

3.4.1 Regressions in level

In this subsection, we present basic results using econometric specification in level.

First of all we perform a regression at the aggregate level (that is at the level of the overall manufacturing sector) of the labor share of income on our variable of interest, the currency crisis dummy.

The estimated model is the following:

$$\begin{aligned} LS_{i,t} &= a + a_i + a_t + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \beta_4 CRISIS_{it-3} \\ &\quad + \gamma_1 I/Y_{it} + \gamma_2 SCHOOL_{it} + \gamma_3 OPENK_{it} + \gamma_4 OPENT_{it} + \varepsilon_{it} \end{aligned} \tag{33}$$

where a_i is a country fixed effect, a_t a period dummy, $CRISIS$ our crisis dummy, $SCHOOL$ the education variable we have chosen, $OPENK$ the financial openness indicator and $OPENT$ the trade openness. Note that all control variable are included at date t but results remain the same if we introduce at date $t-1$ for a first treatment for endogeneity.

The crisis dummy is contemporaneous, and also lagged until 3 periods in order to estimate the timing of the impact of the crises on the labor share. Doing that, we perform an exercise similar to the one of Diwan (1999) since we work on aggregate data and cannot control for unobserved heterogeneity across sectors thanks to sectoral dummies. However we do control for heterogeneity across countries thanks to country fixed effects. In our case, controlling for unobserved heterogeneity across countries is very important. Indeed, the labor share in developing countries is lower than in the developed ones, see Ortega and Rodriguez (2006). If crises are more likely to occur in developing countries, a negative coefficient could capture only the fact that the labour share is negatively correlated to development. This could be the reason why Diwan (2001) , who does not control for unobserved heterogeneity, finds an impact of the crisis of very high magnitude (-10 points in some regressions). Moreover, time dummies allow us to control for global shocks which could affect the labor share and which are not captured by the other explanatory variables.

Results are reported in table 1.

[Table 1 about here.]

We see that crises negatively impact the labor share but with a lagged effect since the coefficients of $Crisis_t$ are non significant whereas they are all negative and significant for $Crisis_t - 1$, $Crisis_t - 2$ and $Crisis_t - 3$. Moreover, we see that it is the crisis two years before which have the strongest impact on the labor share, which is in line with the decomposition we have performed in the previous subsection. Surprisingly our proxy for capital output ratio reveals to be non significant although positive. The school variable is positive and significant, in line with Daudey and Decreuse (2006). Notice that adding our control variables do not change the significance of the crisis dummies and even increase their coefficient in absolute terms, at least when the de facto openness variable is added. This suggest that the more open countries are, the more the labor share decreases when a financial crises occurs.

We now turn to estimations on sectoral data (ie, the 28 sectors), controlling for unobserved heterogeneity accross sector by adding cross countries fixed effects. All of our sectoral estimations are weighted by the sector shares.

The estimated model is the following:

$$\begin{aligned} LS_{its} &= a + a_i + a_t + a_s + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \beta_4 CRISIS_{it-3} \\ &\quad + \gamma_1 I/Y_{its} + \gamma_2 SCHOOL_{it} + \gamma_3 OPENK_{it} + \gamma_4 OPENT_{it} + \varepsilon_{its} \end{aligned} \tag{34}$$

a_i, a_t and a_j are respectively the countries fixed effects, time dummies, and sectoral dummy. Note that IY is the only sectoral explanatory variable we dispose of.

Once again we regress the labor share on crisis at t, at $t-1$, at $t-2$ and at $t+3$ to see the impact of crisis at different stages of financial turbulence period.

Results are reported in 15

[Table 2 about here.]

All of the regressions are made controlling for the presence of control variables and for the fact that the way the manufacturing sector is decomposed in sub sectors does not change between t and $t-3$. This allow us ensure that all the regressions are made on the same subsample and implies that the observed changes in coefficient when we add control variables does not result from selection bias.

We can derive three lessons from those basic regressions.

One year after the crisis, the labor share is significantly lower and about 2 points compared to what it would be if the crisis had not occurred. The crisis in $t-2$ makes decrease the labor share by about 2 points and we cab observe that the impact of the crisis 3 years before is less strong although significantly negative and of about 1.5 points. Results are not reported here but the labor share stops falling 4 years after the crisis since the coefficient of financial crisis at $t-4$ is close to zero (see Appendix).

· Controlling for capital intensity does not change the neither the magnitude of the coefficients associated to crisis, nor their significance level. Note that contrary to what we obtain in the estimations at

the aggregate level, the coefficient associated to capital intensity is significantly positive, which suggests an elasticity of substitution between labor and capital higher than one. This is in line with Hamermesh (1996) who shows that most of the studies he surveys find that labor and capital are complements. Notice that concerning the school variable, the coefficient is once again significant and positive. Financial openness has an expected negative impact on the labor share only when we measure it by the de jure measure. On the contrary, there is a very strong (3.16), positive and significant correlation between de facto financial openness and the labor share. This is an very surprising result since it is at odds with all the studies which appraise the relationship between financial openness and the labor share and conclude on a negative one, see Harrison (2002), Jayadev (2007) and Ortega and Rodriguez (2002). However we can object that all these studies use a de jure financial openness and invite to reinvestigate the relationship between these two variables.

Finallly, as expected, trade openness has a significant negative impact on the labor share, about -0.13. Hence the impact of trade openness on the labor share is in line with Rodrik type argumentation.

· Finally we want to see whether results differ for developing and developed countries.Here again we do not observe any instantaneous impact of the financial crisis on the labor share. However, the labor share falls one year after the crisis occurs for the two types of countries, but the impact is stronger in the developed countries (more than 2 points) than in the developing ones (about 1.3 points).

[Table 3 about here.]

A major difference between the two types of countries is that financial crises have got a persistent effect in the developing countries since 3 years after they have occurred the labor share still decreases by about 1.2 points, whereas in developed countries financial crises have a non significant impact on the labor share 3 years after.

Concerning control variables, the impact of capital intensity is positive and significant for both countries but much more important for the developed one : in developed countries the coefficient lies between 10.5 and 11.5 points depending on what control of financial openness we use, whereas in the developing ones it is about 2.3. This suggests a higher capital-labor complementarity in developed countries which could lead us to think about skilled labor capital complementarity. However, this argument does not stand since we control for human capital.

The latter, measured by our school variable, has an obvious positive impact in developing countries, but is neglectful and non significant in the developed ones. This would suggest that in developed countries, educated workers are more able to enjoy high wages which depart from their productivity level.

As in the aggregate estimations, trade has got a negative and significant impact for both countries. However we would have expected a positive sign for the developing countries in the light of the HOS model.

De jure financial openness is negatively correlated to the labor share in developed countries. However, signs reverse with the de facto measure of financial openness and the relationship appears to be positive, very strong and significant. We do not have any idea of what can explain these different results, and let us to think that the relationship between financial liberalization and the labor share in rich countries deserves to be reinvestigated. Indeed, In developing country neither the de jure nor the de facto index

is significantly correlated to the labor share but although non significant, the relationship appears to be positive with both measures.

3.5 Within effect vs structural one : Regressions in difference

In this subsection we investigate whether the negative impact of financial crises could be related to reallocation forces driven by the crisis. We have seen previously in the theoretical analysis that financial crises may be suspected of leading to changes in the sectoral composition of the economy.

To answer this question, we perform 3 estimates.

First we estimate the aggregated labor share in changes, that is to say we regress the variations of the aggregated labor shares on financial crises at different times: at t, t-1 and t-2. The estimation model named *m0* is the following:

$$\begin{aligned}\Delta LS_{300} \equiv \Delta LS_i =& a_t + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} \\ &+\gamma_1 \Delta I/Y_{it} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{it}\end{aligned}$$

Second we estimate the sectoral labor share in changes that is we regress that variations of sectoral labor shares on financial crises, once again at different times : t, $t-1$ and $t-2$. By differentiating, country fixed effects and sectoral fixed effects disappear. The model to estimate, named *m1* is the following :

$$\begin{aligned}\Delta LS_{its} = a_t + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} \\ +\gamma_1 \Delta I/Y_{its} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{its}\end{aligned} \tag{35}$$

In this estimate, 2 kinds of regressions are made. In the first one observations are weighted by the sector shares at t, as in the sectoral regressions in level, and in a second one, they are not. The weighted regressions should reflect a within effect of the financial crises on the labor share.

Results are reported in table 4 for all countries, in table 5 for developed countries and in table 6 for the developed ones.

[Table 4 about here.]

[Table 5 about here.]

[Table 6 about here.]

Results on sectoral estimations are very similar to the aggregate ones except the significance level. This is due to the fact that numbers of observation is divided by 28. The loose of degree of freedom affects the significance level. Notice that the timing of the decrease is similar to the one highlighted for estimations in level.

Third we perform estimations on the following model:

Regression Variations Sectoral Labor Share weighted by sectoral shares (Model m2)

$$\Delta LS_{i,t,s} * \phi_{i,t-1,s} = a_t + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \gamma_1 \Delta I/Y_{its} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{its} \quad (36)$$

and on the following one:

Regression Variations Sectoral Shares weighted by labor shares (Model m3)

$$\Delta \phi_{i,t,s} * LS_{i,t,s} = a_t + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \gamma_1 \Delta I/Y_{its} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{its} \quad (37)$$

The m2 model should capture a within effect of the financial crises on the labor share whereas the m3 model should capture a composition effect of the financial crisis. We will the compare the results on these two models with the ones of the m0 model which describe the overall effect of financial crises on the labor share, and with the m1.The m1 model, although different from the m2 one should capture a within effect. In the m2 model these are the intra sectorial variations of the labor share weighted by the sector shares that we regress, and in the m1 model we simply regress the intra sectorial variations of the labor share, weighting the observations by the sector shares.

Results are reported in table 7 for all countries, in table 8 for the developed ones and in table 9 for the developing.

[Table 7 about here.]

[Table 8 about here.]

[Table 9 about here.]

We can observe that the negative impact of financial crises on the labor share comes from an impact on the labor shares within sectors as suggested by our results on the model m2, and by the ones of the m1 one compared to the one of m0.

This result concerns all countries, the developed and the developing ones.

Finally we regress the "within effect " term, and the "between effect" term (see above section "Decomposition") on financial crisis. If the coefficients associated to financial crisis remain as the same magnitude, this would suggest that the impact of financial crises is no explained by sectoral reallocation effects.

Regression Within term (Model m4)

$$\sum_{s=1}^{n} (LS_{s,t} - LS_{s,t-1})\phi_{s,t-1} = a_i + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \beta_4 CRISIS_{it-3} + \gamma_1 \Delta I/Y_{it} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{it} \quad (38)$$

Regression Between term (Model m5)

$$\sum_{s=1}^{n}(\phi_{s,t}-\phi_{s,t-1})LS_{s,t} = a_i + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \beta_4 CRISIS_{it-3} + \gamma_1 \Delta I/Y_{it} + \gamma_2 \Delta SCHOOL_{it} + \gamma_3 \Delta OPENK_{it} + \gamma_4 \Delta OPENT_{it} + \varepsilon_{it} \quad (39)$$

Results are reported in 10 for developed countries and in 11 for the developed ones.

[Table 10 about here.]

[Table 11 about here.]

Once again we conclude that the main part of the observed decrease of the labor share on the manufacturing sector is a "real" one, since the decrease reflects a decrease in the labor share within sectors. This means also that the reallocation effects actually explain only a very small part of the overall decrease of the labor share.

For developed countries, the value of significant coefficient associated to crisis in t-1 is close to the one of the same variable when we perform estimations using ΔLS as a dependant variable, about -1.2 . On the contrary the coefficient of $crisis_{t-1}$ when we regress the "composition effect" term (between term) is of about one fifth and appears to be non significant. Hence we can conclude that the results do not reflect reallocation effects. This does not mean that there are no reallocation forces during financial crisis, but that those reallocations do not affect the labor share. Notice that if we sum the coefficient associated to crisis in the "within" regression, and in the "between" one we exactly obtain the coefficient in regression m0 where ΔLS is used as a dependant variable.

One limit of this analysis is that we have data only on the manufacturing sector. Results using data on the whole economy would maybe make appear strong reallocation effects in favor of capital share. This could be the reason why Diwan (who does not control for) find a so important decrease in labor share following a financial crisis.

3.6 One size fits all?

Whereas the theoretical literature on financial crisis has made a clear distinction between the different kinds of currency crisis, the empirical one does not make a clear distinction and usually uses the same variable for all crisis episodes. (A first attempt in the was Kaminsky and Reinhart (1999) who distinguish between 'simple' currency crises and currency crises associated with a banking ones.) Kaminsky (2006) distinguish between 6 kinds of crises using the same sub sample of countries as us. Here we take her classification and run our core regressions on each kind of crisis.

Using modified version of the leading indicators methodology, Reinhart (2003) classifies crisis into 6 different kind (see Kaminsky and Reinhart (1999) or Kaminsky (2006) for a complete description of the methodology). She identifies several indicators and use it to classify crises thanks to this methodology.

The first group identified corresponds to the first generation model Krugman (1979) nd is characterized by fiscal problems (FD). The second group corresponds to second generation crises (Obstfeld (1996)) and

are characterized by only real appreciation creating current account problem (CA) that makes currency vulnerable to speculative attack. The main characteristic of the third generation model (see for example Chang and Velasco (2001)) is booms in financial markets. We put into this group crises associated with financial excess (FE). Sudden stop crises (SS) constitutes the fourth group characterized by an external shock on world interest rate. The fifth group identified by Kaminsky corresponds to sovereign debt crisis (SD) and is characterized by unsustainable foreign debt (level and maturities). Finally when crises are associated with no fragility, crises are labeled self fulfilling crisis (SS). [12].

The basic regression we did in the "core regression" part are run for each group of crisis.

[Table 12 about here.]

Interestingly each crisis except self fulfilling one seems to be associated with a decrease in labor share. What change is the magnitude and the timing of the decrease. Some of them have long lasting effect on the income distribution. Furthermore crises of the first generation are associated with a decrease of labor share about 10 percentage points whereas the decrease is more modest for crises of the third generation whose decrease is around 1.5 point just for one year.

As Kaminsky (2006) shows, emerging economies and matures ones are not affected by the same kind of crises. Crises associated with financial excess, fiscal deficit or sovereign debt problem are more located in emerging economies whereas sudden stop crisis or self fulfilling ones occur more in mature economies. This could explain the differences in the magnitude of the impact of financial crisis on emerging markets and mature economies.

One should note however that the majority of crises are characterized by multiple fragilities and that there exist some complementarities between them.

[12]Note that Kaminsky identified only four crises of this type

4 Conclusion

In this paper we show that the cost of crises is mainly supported by labor. Financial crises which are associated with a drop in output are also associated with a clear decrease in the labor share during three years of around 2.5 percentage points which means that labor looses around 7.5 percentage points of GDP overall.

In the empirical part of the paper, we discriminate between several possible explanations. We conclude that technological determinants have to be excluded from taking part of the explanatory variables, since controlling for capital intensity does not change the magnitude of the impact of financial crises on the labor share. We also exclude reallocation effects. Hence the "bargaining strength" argument is elected to explain the decrease in labor share during financial turbulence. This is in line with Diwan (1999) and also with what Rodrik (1997) or Harrison (2002) claim : capital is very mobile and its returns are determined on the international markets whereas labor is much less mobile and its outside opportunities are determined on the home market. Since financial distress is characterized by brutal changes in returns on capital, labor is sacrificed in order to preserve capital stock and so investment from leaving.

5 Appendix

5.1 Data

5.1.1 UNIDO Data

Wages and salaries: All payment in cash or in kind paid to "employees", including direct wages and salaries, remuneration for time not worked, bonuses and gratuities, housing and family allowances paid directly by the employer and payment in kind. Despite UNIDO recommendation, employer's social security contributions and pensions and insurance schemes can remain.

Value Added:Can be at factor cost (i.e. excluding indirect taxes minus the subsidies) or at market cost (including indirect taxes minus the subsidies), depending on the treatment

Gross fixed capital formation: refers to the value of purchases and own-account construction of fixed assets during the reference year less the value of corresponding sales. The fixed assets covered are those (whether new or used) with a productive life of one year or more.

5.1.2 List of countries

We use the classification of the World Bank to separate countries according to their level of development. The criterion is the Gross National Income per capita. There are 4 developed countries which are the high income ones, and 16 developing countries which are ther lower middle income and upper middle income ones.

[Table 13 about here.]

5.1.3 List of sub sectors

[Table 14 about here.]

6 Decomposition in three terms

In an alternative decomposition of the variation of the aggregate labor share, a third terms appears.

$$LS_{t+2} - LS_{t-1} = \underbrace{\sum_{s=1}^{n}(LS_{t+2,s} - LS^{i}_{t-1,s})\phi_{t-1,s}}_{\text{within effect}} + \underbrace{\sum_{s=1}^{n}(\phi_{t+2,s} - \phi_{t-1,s})LS_{t-1,s}}_{\text{compostion effect}} + \underbrace{\sum_{s=1}^{n}(LS_{t+2,s} - LS_{t-1})(\phi_{t+2,s} - \phi_{t-1,s})}_{\text{interaction term}}$$

In this decomposition, the "within" term remains the same as in the previous one. The "composition" effect of the previous decomposition is here itself decomposed in two terms: the first can be named 'the net composition effect' (the variation of sector shares weighted by the *initial* labor shares of each sectors, and the second one is an interaction term corresponding to the covariance of the variation of labor share and the variation of sector share.

7 Sectoral regression in level

Here we add the regression results of following the estimated model to show that the labor share stops falling 4 years after the crisis occurs.

$$\begin{aligned} LS_{its} &= a_i + a_t + a_s + \beta_1 CRISIS_{it} + \beta_2 CRISIS_{it-1} + \beta_3 CRISIS_{it-2} + \beta_4 CRISIS_{it-3} + \beta_5 CRISIS_{it-4} \\ &\quad + \gamma_1 I/Y_{its} + \gamma_2 SCHOOL_{it} + \gamma_3 OPENK_{it} + \gamma_4 OPENT_{it} + \varepsilon_{its} \end{aligned} \tag{40}$$

[Table 15 about here.]

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Figures

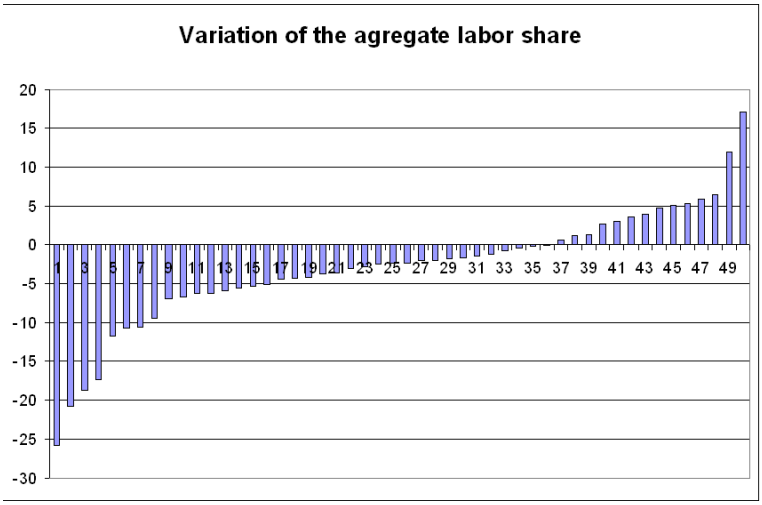

Figure 1: Variation of the labor share between $t-1$ and $t+2$, crisis in t

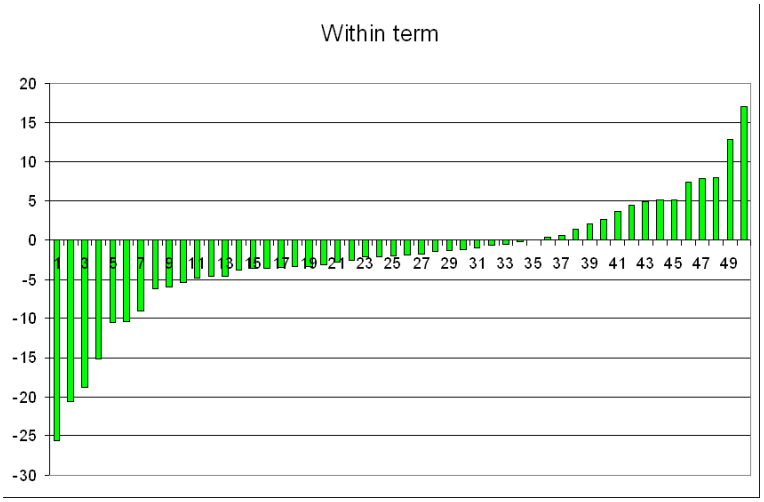

Figure 2: Distribution of the within term between $t-1$ and $t+2$

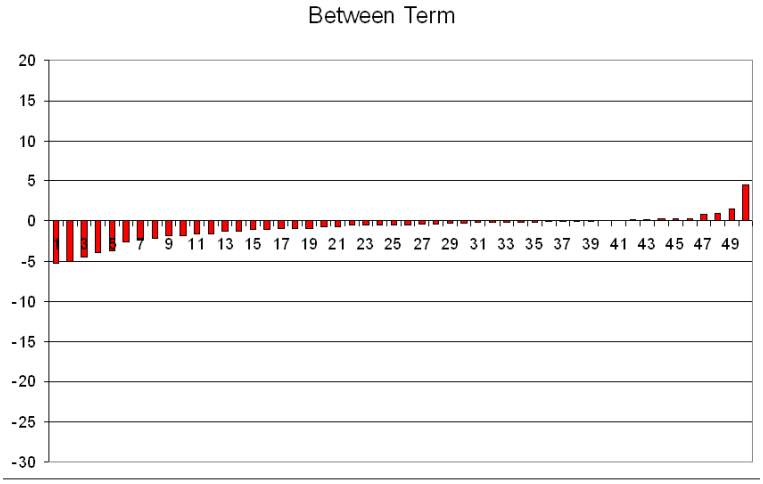

Figure 3: Distribution of the between term between $t-1$ and $t+2$

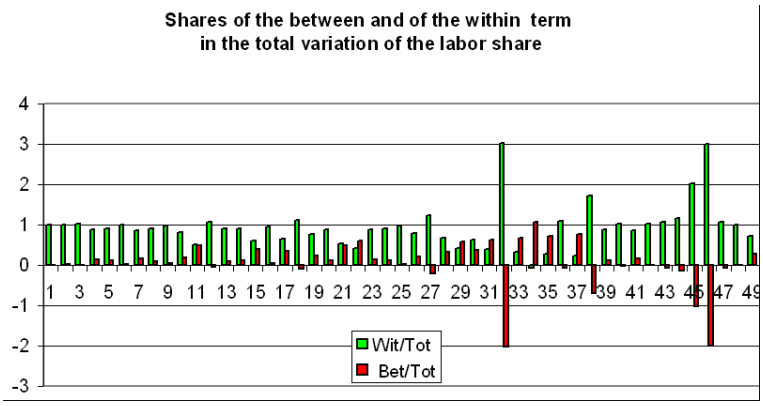

Figure 4: Shares of the within and the between term in the total variation of the LS

Tables

Table 1: Aggregate Data- Core Regressions-All countries

Aggregate Data	a	b	c	d	e
$Crisis_t$	0.31	0.43	0.55	-0.03	0.14
	(0.94)	(0.92)	(0.87)	(0.83)	(0.82)
$Crisis_{t-1}$		-2.19**	-1.91**	-2.14**	-2.17**
		(0.86)	(0.86)	(0.84)	(0.84)
$Crisis_{t-2}$			-2.22***	-2.19***	-2.27***
			(0.81)	(0.77)	(0.79)
$Crisis_{t-3}$			-1.80**	-1.68**	-1.74**
			(0.81)	(0.80)	(0.82)
IY				0.57	0.96
				(7.35)	(7.38)
school				2.71***	2.77***
				(0.74)	(0.74)
OPENK (de jure)				-0.55	
				(0.43)	
OPENK (de facto)					3.00
					(1.89)
OPENT				-0.10***	-0.12***
				(0.03)	(0.04)
Dummies	Yes	Yes	Yes	Yes	Yes
R-squared	0.91	0.92	0.92	0.92	0.92
Nb of Observations	324.00	321.00	318.00	318.00	318.00

* p<0.10, ** p<0.05, *** p<0.01

Table 2: Core Regressions-All countries

Core Regressions	a	b	c	d	e
$Crisis_t$	0.16	0.28	0.40	-0.17	-0.02
	(0.49)	(0.48)	(0.45)	(0.43)	(0.43)
$Crisis_{t-1}$		-2.09***	-1.83***	-2.02***	-2.07***
		(0.45)	(0.44)	(0.42)	(0.43)
$Crisis_{t-2}$			-2.08***	-2.01***	-2.10***
			(0.43)	(0.41)	(0.41)
$Crisis_{t-3}$			-1.66***	-1.48***	-1.55***
			(0.43)	(0.41)	(0.43)
IY				3.97***	4.02***
				(0.89)	(0.89)
school				2.78***	2.84***
				(0.42)	(0.42)
OPENK (de jure)				-0.50**	
				(0.22)	
OPENK (de facto)					3.16***
					(1.01)
OPENT				-0.12***	-0.14***
				(0.02)	(0.02)
Dummies	Yes	Yes	Yes	Yes	Yes
R-squared	0.85	0.85	0.86	0.86	0.86
Nb of Observations	9123.00	9036.00	8959.00	8959.00	8959.00

* p<0.10, ** p<0.05, *** p<0.01

Table 3: Core Regressions-All countries-Developed Countries-Developing Countries

Core Regressions	All	All	Developed	Developed	Developing	Developing
$Crisis_t$	-0.169	-0.020	-0.183	0.307	-0.115	-0.235
	(0.43)	(0.43)	(0.89)	(0.74)	(0.40)	(0.42)
$Crisis_t - 1$	-2.021***	-2.072***	-2.362***	-2.166***	-1.138***	-1.212***
	(0.42)	(0.43)	(0.82)	(0.75)	(0.42)	(0.43)
$Crisis_t - 2$	-2.005***	-2.100***	-0.807	-0.167	-1.706***	-1.725***
	(0.41)	(0.41)	(0.78)	(0.76)	(0.46)	(0.45)
$Crisis_t - 3$	-1.479***	-1.548***	-0.904	-0.438	-1.198***	-1.225***
	(0.41)	(0.43)	(0.91)	(0.98)	(0.39)	(0.39)
IY	3.967***	4.022***	11.267***	10.672***	2.362***	2.328**
	(0.89)	(0.89)	(3.09)	(2.93)	(0.92)	(0.92)
school	2.783***	2.843***	-0.437	0.923	4.660***	4.548***
	(0.42)	(0.42)	(0.94)	(0.98)	(0.55)	(0.56)
OPENK de jure	-0.505**		-2.551***		0.291	
	(0.22)		(0.63)		(0.19)	
OPENK de facto		3.156***		10.880***		0.166
		(1.01)		(1.91)		(0.99)
OPENT	-0.118***	-0.138***	-0.474***	-0.596***	-0.092***	-0.088***
	(0.02)	(0.02)	(0.08)	(0.08)	(0.02)	(0.02)
Dummies	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.861	0.862	0.687	0.696	0.656	0.656
Nb of Observations	8959.000	8959.000	3472.000	3472.000	5487.000	5487.000

* p<0.10, ** p<0.05, *** p<0.01

Table 4: Regressions in Difference-All Countries

Regressions in Difference-All Countries	ΔLS_{300}	ΔLS_{is} weighted	ΔLS_{is} unweighted	$\Delta\varphi_{is}$
	m0	m1	m1	
$Crisis_t$	-1.05*	-0.97***	-0.71***	-0.00
	(0.56)	(0.29)	(0.23)	(0.00)
$Crisis_{t-1}$	-0.90	-0.90***	-0.91***	0.00
	(0.59)	(0.29)	(0.23)	(0.00)
$Crisis_{t-2}$	0.11	-0.02	0.21	0.00
	(0.42)	(0.23)	(0.23)	(0.00)
D.IY	8.79**	4.11***	1.71*	-0.00*
	(3.86)	(1.35)	(0.96)	(0.00)
D.school	0.74	0.66	0.58	0.00
	(1.39)	(0.79)	(0.69)	(0.00)
D.OPENK (de facto)	-2.11	-1.78**	-0.97	-0.00
	(1.56)	(0.83)	(0.73)	(0.00)
D.OPENT	-0.16***	-0.16***	-0.20***	-0.00
	(0.04)	(0.02)	(0.02)	(0.00)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.33	0.15	0.07	0.00
Nb of Observations	305.00	8569.00	8569.00	8576.00

* p<0.10, ** p<0.05, *** p<0.01

Table 5: Regressions in Difference-Developed Countries

Regressions in Difference-Developed	ΔLS_{300}	ΔLS_{is} weighted	ΔLS_{is} unweighted	$\Delta \phi_{is}$
	m0	m1	m1	
$Crisis_t$	0.52	0.40	0.56	0.00
	(0.78)	(0.42)	(0.35)	(0.00)
$Crisis_{t-1}$	-1.25*	-1.23***	-1.45***	0.00
	(0.66)	(0.34)	(0.39)	(0.00)
$Crisis_{t-2}$	0.53	0.67*	0.70**	-0.00
	(0.77)	(0.39)	(0.32)	(0.00)
D.IY	34.24*	12.81***	4.24**	-0.00**
	(17.52)	(3.13)	(1.66)	(0.00)
D.school	-2.52	-2.74**	-3.31***	-0.00
	(2.25)	(1.21)	(1.24)	(0.00)
D.OPENK (de facto)	4.50	5.13***	3.59**	0.00
	(2.94)	(1.67)	(1.53)	(0.00)
D.OPENT	-0.25***	-0.25***	-0.32***	0.00
	(0.08)	(0.05)	(0.04)	(0.00)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.57	0.26	0.11	0.01
Nb of Observations	118.00	3247.00	3247.00	3247.00

* p<0.10, ** p<0.05, *** p<0.01

Table 6: Regressions in Difference-Developing Countries

Regressions in Difference-Developing Countries	ΔLS_{300}	ΔLS_{is} weighted	ΔLS_{is} unweighted	$\Delta \phi_{is}$
	m0	m1	m1	
$Crisis_t$	-2.24***	-2.07***	-1.88***	-0.00
	(0.79)	(0.39)	(0.35)	(0.00)
$Crisis_{t-1}$	-0.30	-0.29	-0.40	0.00
	(0.78)	(0.37)	(0.31)	(0.00)
$Crisis_{t-2}$	0.53	0.23	0.51	0.00
	(0.54)	(0.30)	(0.34)	(0.00)
D.IY	7.03	3.33**	1.38	-0.00*
	(4.38)	(1.30)	(0.90)	(0.00)
D.school	2.76	2.58***	2.82***	0.00
	(1.89)	(0.99)	(0.86)	(0.00)
D.OPENK (de facto)	-3.16	-2.67***	-0.99	-0.00
	(1.92)	(1.01)	(0.87)	(0.00)
D.OPENT	-0.13***	-0.13***	-0.16***	-0.00
	(0.04)	(0.02)	(0.02)	(0.00)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.38	0.17	0.08	0.00
Nb of Observations	187.00	5322.00	5322.00	5329.00

* p<0.10, ** p<0.05, *** p<0.01

Table 7: Regressions in Difference-All Countries

Regressions in Difference-All Countries	ΔLS_{300}	$\Delta LS_{i,t,s} * \phi_{i,t-1,s}$	$\Delta \phi_{i,t,s} * LS_{i,t,s}$	ΔLS_{ij} weighted
	m0	m2	m3	m1
$Crisis_t$	-1.05*	-0.06***	-0.01	-0.97***
	(0.56)	(0.02)	(0.01)	(0.29)
$Crisis_{t-1}$	-0.90	-0.06**	-0.01	-0.90***
	(0.59)	(0.02)	(0.01)	(0.29)
$Crisis_{t-2}$	0.11	0.01	0.00	-0.02
	(0.42)	(0.02)	(0.01)	(0.23)
D.IY	8.79**	0.04**	-0.03*	4.11***
	(3.86)	(0.02)	(0.01)	(1.35)
D.school	0.74	0.05	-0.00	0.66
	(1.39)	(0.06)	(0.03)	(0.79)
D.OPENK (de facto)	-2.11	-0.13*	-0.07***	-1.78**
	(1.56)	(0.07)	(0.02)	(0.83)
D.OPENT	-0.16***	-0.01***	0.00	-0.16***
	(0.04)	(0.00)	(0.00)	(0.02)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.33	0.03	0.01	0.15
Nb of Observations	305.00	8569.00	8569.00	8569.00

* p<0.10, ** p<0.05, *** p<0.01

Table 8: Regressions in Difference-Developed Countries

Regressions in Difference-Developed Countries	ΔLS_{300}	$\Delta LS_{i,t,s} * \phi_{i,t-1,s}$	$\Delta \phi_{i,t,s} * LS_{i,t,s}$	ΔLS_{ij} weighted
	m0	m2	m3	m1
Kcrisis	0.52	0.02	0.01	0.40
	(0.78)	(0.04)	(0.02)	(0.42)
L.Kcrisis	-1.25*	-0.09**	-0.00	-1.23***
	(0.66)	(0.03)	(0.01)	(0.34)
L2.Kcrisis	0.53	0.04	-0.01	0.67*
	(0.77)	(0.04)	(0.02)	(0.39)
D.IY	34.24*	0.12**	-0.11**	12.81***
	(17.52)	(0.06)	(0.04)	(3.13)
D.school	-2.52	-0.15	-0.04	-2.74**
	(2.25)	(0.12)	(0.06)	(1.21)
D.fo	4.50	0.38**	0.03	5.13***
	(2.94)	(0.17)	(0.08)	(1.67)
D.OPENT	-0.25***	-0.02***	0.00	-0.25***
	(0.08)	(0.00)	(0.00)	(0.05)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.57	0.06	0.01	0.26
Nb of Observations	118.00	3247.00	3247.00	3247.00

* p<0.10, ** p<0.05, *** p<0.01

Table 9: Regressions in Difference-Developing Countries

Regressions in Difference-Developing Countries	ΔLS_{300}	$\Delta LS_{i,t,s} * \phi_{i,t-1,s}$	$\Delta \phi_{i,t,s} * LS_{i,t,s}$	ΔLS_{ij} weighted
	m0	m2	m3	m1
Kcrisis	-2.24***	-0.14***	-0.01	-2.07***
	(0.79)	(0.04)	(0.01)	(0.39)
L.Kcrisis	-0.30	-0.02	-0.01	-0.29
	(0.78)	(0.03)	(0.01)	(0.37)
L2.Kcrisis	0.53	0.03	0.01	0.23
	(0.54)	(0.03)	(0.01)	(0.30)
D.IY	7.03	0.03*	-0.02*	3.33**
	(4.38)	(0.02)	(0.01)	(1.30)
D.school	2.76	0.16**	0.04	2.58***
	(1.89)	(0.08)	(0.03)	(0.99)
D.fo	-3.16	-0.17*	-0.11***	-2.67***
	(1.92)	(0.10)	(0.03)	(1.01)
D.OPENT	-0.13***	-0.01***	-0.00	-0.13***
	(0.04)	(0.00)	(0.00)	(0.02)
Dummies (time)	Yes	Yes	Yes	Yes
R-squared	0.38	0.04	0.01	0.17
Nb of Observations	187.00	5322.00	5322.00	5322.00

* p<0.10, ** p<0.05, *** p<0.01

Table 10: Developed countries

Within vs Between Developed countries	ΔLS_{300}	Within term	Between term
	m0	m4	m5
$Crisis_t$	0.52	0.44	0.09
	(0.78)	(0.87)	(0.12)
$Crisis_{t-1}$	-1.25*	-1.20*	-0.05
	(0.66)	(0.67)	(0.14)
$Crisis_{t-2}$	0.53	0.49	0.04
	(0.77)	(0.82)	(0.17)
D.IY	34.24*	32.03*	2.21
	(17.52)	(18.99)	(2.65)
D.school	-2.52	-1.59	-0.93**
	(2.25)	(2.34)	(0.45)
D.OPENK (de facto)	4.50	3.84	0.66
	(2.94)	(3.03)	(0.50)
D.OPENT	-0.25***	-0.25***	0.00
	(0.08)	(0.09)	(0.02)
Dummies (time)	Yes	Yes	Yes
R-squared	0.57	0.52	0.37
Nb of Observations	118.00	118.00	118.00

* p<0.10, ** p<0.05, *** p<0.01

Table 11: Developing countries

Within vs Between Developing countries	ΔLS_{300}	Within term	Between term
	m0	m4	m5
$Crisis_t$	-2.24***	-1.83***	-0.40
	(0.79)	(0.67)	(0.30)
$Crisis_{t-1}$	-0.30	-0.18	-0.12
	(0.78)	(0.68)	(0.33)
$Crisis_{t-2}$	0.53	0.33	0.20
	(0.54)	(0.57)	(0.34)
D.IY	7.03	-0.82	7.86***
	(4.38)	(2.83)	(2.53)
D.school	2.76	1.67	1.09
	(1.89)	(1.66)	(0.90)
D.OPENK (de facto)	-3.16	-1.22	-1.94**
	(1.92)	(1.66)	(0.83)
D.OPENT	-0.13***	-0.12***	-0.01
	(0.04)	(0.04)	(0.02)
Dummies (time)	Yes	Yes	Yes
R-squared	0.38	0.35	0.38
Nb of Observations	187.00	187.00	187.00

* p<0.10, ** p<0.05, *** p<0.01

Table 12: one size fit all?

one size fits all?

Specification	FE	CA	FD	SS	SF	SD
$CRISIS_{t+1}$	-1.343	2.632^{*}	0.586	-1.075	-0.848	2.594^{***}
	(0.852)	(1.475)	(2.073)	(1.147)	(1.550)	(0.719)
$CRISIS_{t}$	-1.886^{**}	0.343	-8.361^{***}	-2.329^{**}	-0.164	1.319^{**}
	(0.959)	(1.680)	(1.297)	(1.058)	(1.243)	(0.644)
$CRISIS_{t-1}$	0.928	-1.775^{**}	-10.258^{***}	-3.361^{***}	-0.569	-1.049
	(0.665)	(0.884)	(1.191)	(0.898)	(1.336)	(0.759)
$CRISIS_{t-2}$	0.469	-2.229^{***}	-7.512^{***}	-4.579^{***}	2.807^{*}	-1.973^{***}
	(0.644)	(0.703)	(1.435)	(0.851)	(1.552)	(0.731)
I/Y	2.602^{***}	2.527^{***}	3.665^{***}	2.635^{***}	2.617^{***}	2.541^{***}
	(0.969)	(0.956)	(1.134)	(0.976)	(0.974)	(0.946)
SCHOOL	2.613^{***}	2.569^{***}	2.240^{***}	2.805^{***}	2.608^{***}	2.052^{***}
	(0.492)	(0.489)	(0.462)	(0.485)	(0.485)	(0.477)
OPENK	-0.184	-0.051	-0.333	-0.109	-0.083	-0.166
	(0.241)	(0.241)	(0.228)	(0.241)	(0.242)	(0.234)
OPENT	-0.144^{***}	-0.143^{***}	-0.163^{***}	-0.150^{***}	-0.147^{***}	-0.128^{***}
	(0.017)	(0.018)	(0.017)	(0.018)	(0.018)	(0.017)
Dummies	yes	yes	yes	yes	yes	yes
No observations	8832	8832	8832	8832	8832	8832
R-squared	0.858	0.858	0.864	0.859	0.857	0.859
No crisis						

Notes: Robust standard in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 13: List of countries

Countries	Income class
Argentina	Upper middle income
Bolivia	Lower middle income
Brazil	Upper middle income
Chile	Upper middle income
Colombia	Lower middle income
Denmark	High income
Finland	High income
Indonesia	Lower middle income
Israel	High income
Malaysia	Upper middle income
Mexico	Upper middle income
Norway	High income
Peru	Lower middle income
Philippines	Lower middle income
Spain	High income
Sweden	High income
Thailand	Lower middle income
Turkey	Upper middle income
Uruguay	Upper middle income
Venezuela	Upper middle income

Table 14: Sub Sectors

Isicccode	Sub sector
311	Food products
313	Beverage
314	Tobacco
321	Textile
322	Wearing apparel, except footwear
323	Leather products
324	Footwear, except rubber or plastic
331	Wood Products
332	Furniture, except metal
341	Paper and products
342	Printing and publishing
351	Industrial chemicals
352	Other chemicals
353	Petroleum refineries
354	Misc. petroleum and coal products
255	Rubber products
356	Plastic products
361	Pottery, china, earthenware
362	Glass and products
369	Other non-metallic mineral products
371	Iron and steel
372	Non ferrous metal
381	Fabricated metal products
382	Machinery, except electrical
382	Machinery, electric
384	Transport equipment
385	Professional and scientific equipment
390	Other manufactured products
Tot= 28	

Table 15: Core Regressions-All countries

Core Regressions	a	b	c	d	e
$Crisis_t$	0.13	0.25	0.36	-0.16	0.01
	(0.49)	(0.48)	(0.46)	(0.43)	(0.44)
$Crisis_{t-1}$		-2.15***	-1.84***	-2.06***	-2.07***
		(0.45)	(0.44)	(0.42)	(0.43)
$Crisis_{t-2}$			-2.07***	-1.99***	-2.08***
			(0.43)	(0.41)	(0.41)
$Crisis_{t-3}$			-1.59***	-1.44***	-1.48***
			(0.43)	(0.42)	(0.43)
$Crisis_{t-4}$			-0.05	0.10	0.22
			(0.48)	(0.45)	(0.46)
IY				3.42***	3.47***
				(0.87)	(0.87)
school				2.77***	2.81***
				(0.42)	(0.42)
OPENK (de jure)				-0.43*	
				(0.23)	
OPENK (de facto)					2.86***
					(0.96)
OPENT				-0.11***	-0.13***
				(0.02)	(0.02)
Dummies	Yes	Yes	Yes	Yes	Yes
R-squared	0.85	0.86	0.86	0.86	0.86
Nb of Observations	8915.00	8799.00	8741.00	8741.00	8741.00

* p<0.10, ** p<0.05, *** p<0.01