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Giuseppe Bertola and Anna Lo Prete:  
Openness, Financial Markets, and Policies:  
Cross-Country and Dynamic Patterns

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# Openness, Financial Markets, and Policies: Cross-Country and Dynamic Patterns

Giuseppe Bertola\* and Anna Lo Prete\*\*

## Abstract

We document significant and robust empirical relationships in cross-country panel data between government size or social expenditure on the one hand, and trade and financial development indicators on the other. Across countries, deeper economic integration is associated with more intense government redistribution, but more developed financial markets weaken that relationship. Over time, controlling for country-specific effects, public social expenditure appears to be eroded by globalization trends where financial market development can more easily substitute for it.

**JEL Codes:** F36, G1.

**Keywords:** Financial markets, economic integration, government redistribution, panel data, globalization.

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## **Nontechnical Summary**

Recent data on government redistribution confirm Rodrik's finding that government policies meant to shelter citizens from risk may be more important in countries where international market access efficiently fosters opportunities to trade, but also subjects workers to more frequent and intense shocks. Interestingly enough, we document that this relationship is weakened in countries where financial markets are more developed.

In theory, international competition makes it difficult to implement social protection schemes at the same time as it introduces new sources of income risk. Tax and subsidy competition among national systems reduces the effectiveness of collectively enforced national policies. Our paper finds that, controlling for country and time effects, public social expenditure appears to be eroded by globalization trends when and where financial markets are better developed. The evidence suggests that in an increasingly integrated world, government policies have been substituted by financial market development to a different extent in different countries.

## **1. Introduction**

This paper brings two simple theoretical insights to bear on cross-country panel data. The first is that individual welfare depends importantly on the possibility to shelter consumption from labour market and health risks, but financial markets are not always so well developed as to allow households to do so effectively. Thus, policies and institutions buffer the impact of labour demand shocks on wages and employment, and taxes and subsidies further decouple household incomes from market outcomes. Such institutions are also expected to be shaped by a second set of theoretical considerations, concerning international integration of economic activity. The risks entailed by international trade and specialization may make government policies' income redistribution role more important. At the same time, however, economic integration makes it more difficult and expensive to implement such policies: international competition increases the relevance of cost competitiveness, makes it difficult to operate social protection schemes based on youth education and lifelong employment, and challenges governments' taxation powers (Sinn, 2003).

Our empirical analysis, based on these insights, builds upon recent studies of the relationship between international economic integration and governments' interference with free market outcomes. Over the last 100 years, openness to international trade and within-country income inequality have followed very similar U-shapes (Atkinson and Piketty, 2007). While direct links between the two are difficult to detect empirically (OECD, 2007), there is strong and robust survey evidence that attitudes towards economic integration are driven by income distribution implications (Mayda, O'Rourke, and Sinnott, 2007), and that exposure to international competition through foreign direct investment increases perceived job insecurity (Scheve and Slaughter, 2004). Empirically, more open countries engage in more pervasive interference with market-driven income distribution processes in the data analysed by Rodrik (1998), Agell (2002), and others.

The theoretical considerations introduced above suggest that the relationship between economic integration and government policies should depend on the extent to which private contracts can, through formal insurance or self-insurance, make policy less necessary for consumption-smoothing purposes. International competition makes it difficult for governments to meet demand for protection from risk, and makes it increasingly important for households to access private financial markets. Our analysis of cross-country differences and country-specific trajectories in a panel dataset of government policy, financial development, and openness indicators aims at detecting such empirical patterns.

In the data we analyse, international economic integration tends to be accompanied in cross-section by larger government budgets and more intense redistribution, and also tends to be associated with stronger financial market development. Financial development interacts significantly with openness in explaining the intensity of governments' interference with market outcomes, indicating that different income and consumption-smoothing schemes do substitute each other in addressing the insurance needs generated

by increasing openness. Over time, controlling for country-specific characteristics, increasing openness tends to reduce government redistribution, and does so more strongly in countries with better private financial markets.

## 2. Governments and Openness

We begin, following Rodrik (1998), by inspecting the association in our data between openness and government involvement in income distribution. We run regressions in the form

$$G = \alpha + \beta \text{Openness} + Z\varphi + u \quad (1)$$

where the dependent variable is an indicator of the State's involvement in resource redistribution: either the government's share of GDP from the Penn World Tables, a broad measure available for a very wide set of countries, or more direct measures of social policy expenditures, available only for some OECD countries (see Table A1 in the Appendix for a list of the countries included in the two samples).

We are interested in empirical relationships between openness as a source of ongoing risk, and spending as a result of policy choices, rather than in the cyclical behaviour of import, exports, and government expenditures within a given structural and policy framework. To reduce the relevance of cyclical fluctuations, we average yearly observations. The timing and length of periods over which averages are computed make very little difference to the results: in our preferred specifications, averages (of logs) are taken over 5-year intervals and, since lagging driving processes reduces endogeneity concerns, openness is measured on the basis of the previous period's average values. As yearly data are available between 1980 and 2003 for most variables and most countries, we can construct four 5-year periods, and a fifth covering the 2000–2003 four-year interval. We focus on the balanced panel of countries for which observations are available in all those five periods. The results are very similar if observations available only for some countries are included in specific periods.

Table 1 reports regressions of government policy variables on openness measured as the log of the ratio of imports plus exports to GDP, averaged over the 10 years previous to the beginning of each 5-year sub-period. As to control variables,  $Z_{it}\varphi$  in (1), we have experimented with the inclusion of the log of per capita GDP at the end of the previous sub-period, drawn from the Penn World Tables dataset, and with World Bank area dummies.<sup>1</sup> As the empirical evidence is not materially affected by these control variables, we discuss but do not report these results.

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<sup>1</sup> The dummies refer to the following groups of countries: High Income, Europe and Central Asia, East Asia, South Asia and Pacific, Sub-Saharan Africa, Middle East and North Africa, Latin America and Caribbean. From a theoretical point of view GDP per capita and country dummies may suitably summarize many country-specific and time-varying exogenous factors, including cyclical conditions and at least some demographic influences (in our preferred specification, pension expenditure is not included in the social policy indicator). Specification searches on more extensive sets of covariates would be in danger of detecting spurious rather than structural relationships.

Like Rodrik (1998), and over a longer range of periods, we find in Table 1 that the cross-sectional association between openness and the government's share of GDP is positive and strong when all countries are considered. The coefficients are very similar across periods; a formal test does not reject the hypothesis that they are the same. In regressions not reported we find the results robust to the inclusion of GDP per capita, which after controlling for openness has a negative coefficient as an explanatory variable for government expenditure. The relationship between openness and the share of government in GDP is also positive (if somewhat less significant, especially in the 1995–2003 period) when the sample is restricted to the OECD countries with information about social policy. The information in the data, especially those of the more recent cross sections, is not sufficient to provide precise estimates in such a small sample. In fact, as in Rodrik's results, controlling for European location suffices to eliminate most of the relevant variation. Including GDP per capita does not change these findings.

For OECD countries, we also report in part C of Table 1 regressions documenting the association between openness and social policy, measured as a share of GDP, excluding old age pensions from the Public Social Expenditure OECD database available for the 1980–2003 period on a yearly basis.<sup>2</sup> This relationship is positive in all cross-sections and strongly significant in the early ones. Interestingly, the strength of the relationship declines over time across the last four columns of the table.<sup>3</sup>

This pattern may be driven by a variable that differs across countries and becomes less heterogeneous over time. Since private financial contracts can theoretically substitute government policies in buffering the distributional implications of international trade shocks, indicators of financial development are plausible candidates to play that role. Before assessing their empirical relevance in the next section, where we run panel regressions with interaction coefficients, we need to discuss whether the pattern detected by the repeated cross-section results may be driven by misspecification.

If the effect of openness were itself nonlinear, and stronger when openness increases along with financial development, the interaction effects would spuriously pick up that nonlinearity. Including the square of openness among the explanatory variables of the specifications reported in Table 1 returns a positive coefficient only for that reported in Panel A; this motivates us to check, in the regressions reported below, whether the inclusion of the squared openness variable changes the estimated coefficients of interaction terms. In the OECD sample regressions reported in Panels B and C, the squared openness regression coefficient is actually negative (and not significant in most

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<sup>2</sup> We exclude old age and survivor pensions because pension schemes have very different redistributive character across countries. We also expect pension expenditures to be only loosely related (e.g. through early retirement policies) to international trade shocks. Indeed, the regression specifications reported below have uniformly lower explanatory power for indicators of social policy that include pensions.

<sup>3</sup> A formal test rejects the hypothesis that the coefficients are the same in these cross-sections at a 13.6% confidence level. The coefficients of openness in regressions that include GDP also feature a statistically significant positive correlation between openness and government expenditure; the coefficient of GDP is positive, possibly reflecting the bias towards social policies of government expenditure in richer countries.

cases): this indicates that misspecification is not the source of nonlinear effects, and fosters confidence in the economic interpretation of financial development interactions.

### 3. Finance and Redistribution in Opening Economies

Access to financial instruments makes it less necessary to rely on government redistribution in order to smooth consumption in the face of individual-specific shocks (Bertola and Koeniger, 2007). Countries are heterogeneous in the effectiveness of their legal and administrative frameworks in supporting markets and administrations, and a large body of work views market development and regulatory interferences as determined by countries' "legal traditions" shaping patterns of substitutability across public and private approaches to income distribution (see La Porta et al., 1998, and other references in Djankov, McLiesh, and Shleifer, 2007). While the flexible common law system of Anglo-Saxon countries appears more suitable to support private contractual relationships, the code-based systems of Continental European and other countries influenced by the French legal tradition seem to stifle development of private markets, while perhaps fostering relatively efficient bureaucratic administration of government schemes.

To assess the relevance of these insights in the datasets analysed in the previous section, we specify models relating openness to indicators of financial development. First, we run regressions in the form

$$Fin = \alpha + \beta Openness + Z\varphi + u \quad (2)$$

where the indicators of government involvement considered by (1) are replaced as dependent variables by indicators of financial development, drawn from the World Bank's Financial Structure Dataset, as documented in Beck, Demirgüç-Kunt, and Levine (2001).

We report in Table 2 regression results for a volume measure, Private Credit by Deposit Money Banks as a share of GDP (in logs), or a price measure, the Net Interest Margin (the difference between lending and borrowing rates at commercial banks). Both variables are defined in terms of yearly observations at the beginning of each sub-period; see the Appendix for more detailed definitions of these and all other variables.

The pattern of the results shown in Table 2 is broadly similar to that of other regressions we have run with different variables, different timing of observations, and simple controls in the form  $Z\varphi$ : more open countries feature larger financial market volumes, and smaller interest rate spreads. As shown in the set of cross-section results in Table 2, the bivariate relationship between openness and credit is strongly positive; the coefficients are found to be insignificantly different by formal tests. The inclusion of GDP per capita, in regressions not shown, absorbs a large portion of the relevant variation leaving an insignificant coefficient to openness as a determinant of credit volume; the results are similar if openness and GDP are measured on a contemporaneous rather than lagged basis. Even less information is contained in the fewer and noisier observations of interest margins, but the regressions reported in part B of Table 2 estimate a negative (insignificant) coefficient, confirming that more openness to international trade is

associated not only with higher volumes, but also with better (to the limited extent that it may be observable) efficiency of financial markets.

Next, we assess whether in countries with more developed financial markets the pressure to increase government involvement in response to a greater exposure to international competition is lower. To this end we explore the co-variation between openness, government expenditure, and financial market development, running regressions in the form

$$G = \alpha + \beta Openness + \gamma FinStruct + \delta (Openness * FinStruct) + Z\phi + u \quad (3)$$

where the credit and price indicators used in (2) are replaced by more suitable indicators of financial market structure, namely: the World Bank's credit information index (available for many countries, but only on an essentially cross-sectional basis – we average the 2005 and 2006 observations); and the maximum loan-to-value ratio (LTV) for mortgages (see the Appendix for more details on data sources).

Part A of Table 3 reports regressions in the form (3) that estimate how openness and the credit information index perform as explanatory variables of the government's share of GDP. The main effect of openness is positive and significant; more interestingly, the interaction term between openness and the indicator of financial market structure is negative.<sup>4</sup> Since the credit information index is measured only in 2005 and 2006, the interaction coefficients are imprecisely estimated, and not significantly different from zero, in the earlier periods. This proxy of financial market structure ranges between 1 and 6, hence the impact of openness on government spending, as estimated by the interacted slope coefficient  $\beta + \delta FinStruct$ , spans both sides of the point estimate in the broad sample analysed in part A of Table 1. The range of variation of the index is much smaller across the OECD countries, where it reaches the lower bound at 3.5. Regressions (not reported) indicate that the interaction effect is far less significant when estimated on the OECD subsample of these data. This may indicate that the features captured by differences in credit infrastructure across developed countries are less relevant to our perspective than those observed in the broader sample: intuitively, differences across OECD countries are smaller than those across less developed countries and, especially, those between the two groups of countries.

More precise and relevant information is available for the OECD sample not only as regards the redistribution role of the government, in the form of public social expenditure as a share of GDP introduced and analysed above, but also as regards households' access to financial instruments, in the form of loan-to-value ratios on housing mortgages. In part B of Table 3 we find that, without controls, the interaction between LTV and openness as explanatory variables for public social expenditure is negative in more recent years. Including GDP as a control explains a large portion of the variation in social spending as a fraction of GDP, and the interaction between LTV and openness, while still negative in more recent years, becomes less significant.

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<sup>4</sup> Interactions with financial development indicators remain negative, if less significant, if the square of openness is included in the panel version of that regression.

Of course, the interpretation of these results is not straightforward: since GDP is not a completely exogenous variable, its impact on the results reflects possible causal relationships between GDP per capita and social spending. From the statistical point of view, however, the declining pattern over time of the slope coefficients of openness in the cross-country regressions of Table 1 is interestingly accounted for by increasingly easy financial market access (across OECD countries the average LTV was about 75 in the 1980s and about 90 in the 2000s). These regressions also pick up differences in the paths followed by different countries: while in the 1980s Anglo-Saxon members of the OECD such as the UK and the US already featured LTV ratios greater than 80%, countries such as Italy only converged to such values in the late 1990s, starting from LTV ratios as low as 56% in the earlier periods of the sample.

The relevance of time-series trajectories in these regressions begs more general questions regarding country-specific evolutions and reforms. To assess the extent to which LTV variation accounts for the heterogeneity of the estimated coefficients, the next section reports the results of panel estimations that constrain the coefficients to be the same across all observations and control for country-specific effects.

#### **4. Dynamics and reforms**

The results reported so far establish that globalization tends to be associated with larger governments across countries, but also that this association is less pronounced across developed countries, where it tends to become shallower over time and more strongly so where financial markets are better developed. It is not easy to interpret these and other patterns observed in the data in structural terms, because deeper unobservable variables may determine both government expenditure and the components of openness and financial market structure that reflect policies.

To the extent that historical and geographical factors driving country experiences are stable over time within the sample period, however, it is possible to account for them in terms of country-specific intercept effects. Bertola (2007) reports that, in panel regressions on yearly data with country dummies, the estimates suggest that more openness is associated with less generous social expenditure, and that the relationship is stronger in countries where financial markets are more developed. This may indicate that, within each country, additional demand for socially provided insurance is more than offset by increasingly difficult supply of social protection in conditions of intense international competition. However, the negative association between openness and social policy detected by regressions with country dummies (hence over time for a given country) may well reflect cyclical rather than structural slow-moving mechanisms.<sup>5</sup>

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<sup>5</sup> In the annual dataset used in that paper, in fact, allowing for country-specific trends as well as intercepts returns a negative coefficient for openness as an explanatory variable of social policy. To the extent that trends capture deterministic differences in country growth, this indicates that in annual data cyclical fluctuations tend (in this sample) to produce a negative association between social expenditures (in a given policy framework) and measured openness.

The period-averaged data used in the present paper makes it possible to smooth out cyclical factors, as well as to control for country-specific effects so as to focus on dynamic relationships. For most of the variables in our regressions it is also possible to construct such averages over a longer time-span than in Rodrik (1998) and Bertola (2007). Thus, we run regressions of government policy indicators on the previous sub-period's averages of openness (in logs) and of financial market indicators, again checking whether the results are robust to the inclusion of controls such as real GDP per capita and regional dummies. Our panel analysis can exploit information on the 1980–2003 time span, divided into 5 sub-periods, and regresses each sub-period's average of indicators of government involvement on openness and financial market indicators computed as mean values over the previous five years.

In the regressions on the Penn World Tables sample, with the government's share of GDP as dependent variable, a pooled panel specification yields a positive estimate for the interaction of openness and the volume of private credit (the credit information index, which would be a more suitable interaction variable, is only available for the last period). The interaction becomes negative when fixed effects are included, but remains insignificant, and the same specification returns negative interaction estimates when run on the OECD sample of countries. In what follows, we display and discuss in detail the similar, but more precise and interesting estimates produced by the social policy and LTV indicators available for the OECD sample of countries.

In Table 4 we report pooled-OLS, random-effects, fixed-effects and first-difference estimates of the coefficients of the regressions in the form of equations (3).<sup>6</sup> In the first column of Table 4, we find that the main effect of openness on social policy is positive and significantly different from zero in pooled panel estimates including interactions with LTV. Random-effects estimation leads to very similar results, but fixed-effects estimation (third column of Table 4) reports a smaller main effect of openness, and the Hausman test indicates that accounting for country effects is necessary to obtain consistent estimates of the results of interest. The country-specific intercept estimates (not reported) control for permanent influences on social policy: unsurprisingly they are more positive for Scandinavian and Continental European countries than for Anglo-Saxon and Mediterranean countries, as well as for Japan. This is consistent with well-known features of the various countries' reliance on formal welfare state expenditures, rather than on regulatory instruments such as employment protection legislation, and with the different role of family support networks in different cultures (see for instance Esping-Andersen, 1990, and the further discussion in Section 5 below).

In Table 4, the main effect of openness as an explanatory variable for social policy is positive and significant, if less so in the first-difference estimator of the last column. As in Rodrik's first-differenced specifications, where the interactions of interest were with terms of trade variability (see his Table 5, p. 1018), the more interesting findings are

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<sup>6</sup> The results are not affected by the inclusion of squared openness among the regressors. The various specifications aim at estimating (robustly to some unobserved heterogeneity) the same coefficients: thus, the interpretation of the interaction coefficient is the same as that outlined when discussing the functional form of equation (3).

those that relate openness to social policy after accounting for its interaction with the LTV financial development indicator. In the pooled estimates, the main effect is in the order of 0.96, and the interaction coefficient in the order of -0.008. To interpret these results, recall that the association between social policy and openness is measured by  $\beta + \delta FinStruct$  in the notation of equation (3). As the estimated value of  $\delta$  is negative and the LTV ratio ranges between 50% and 105% across the (lagged and averaged) 5-year sub-periods in the sample, the coefficient  $\beta + \delta FinStruct$  that relates log openness to social policy ranges between one-half for the observations with the poorest financial market conditions, and zero for those with the easiest access to credit. As to significance, the interacted slope coefficient of openness is statistically different from zero with better than 10% confidence for values of LTV smaller than 100%.

In the panel-data specifications of Table 4, the inclusion of fixed effects leaves the interaction point estimates essentially unaffected at about -0.009, and the fact that the main effect is estimated at zero implies that over time, for given country-specific characteristics, more openness is for all countries associated with less generous social policy. The interacted coefficient is statistically negative with more than 10% confidence for LTV values larger than about 96%. The results are qualitatively similar for the first-differenced specification, where the interaction term has a lower coefficient. The inclusion of the control variables mentioned when discussing previous tables leaves all these results unaffected.

## **5. Welfare State Models and Labour Market Regulation**

Our results indicate that increasing openness does tend to be associated with more government involvement (as in Rodrik's seminal contribution), but only if financial markets are not well developed. Where they are, its main association is that with the financial market outcomes documented by the regressions in the form (3) reported in Table 3.

Since our analysis focuses on controls of labour-market risk, the social policy expenditure indicator used in the regressions above may be too broad to capture the relationships of interest between insurance-oriented public programmes, openness, and financial development. Experimenting with similar specifications on narrower definitions of social expenditure, such as the ratio to GDP of "Active Labour Market Programmes" and/or "Unemployment" expenditures in the OECD classification, does not yield particularly informative results. At this level of policy disaggregation, in fact, expenditures need not provide accurate information on the relevant characteristics of welfare systems as diverse as those that emerged from the historical development of nation states. In Continental European countries, institutions meant to endow workers with some bargaining power and to equalize their wages can play a role similar to that of income taxes and direct subsidies in restraining market forces and shaping individual incomes (Agell, 2002).

Indicators are available from OECD sources for these and other insurance-oriented institutions. Active Labour Market Programmes (ALMPs) expenditures can and should be normalized by unemployment rates as well as by aggregate GDP levels, and the

generosity of unemployment benefits can be sensibly normalized by previous wages, as in gross replacement rate (GRR) indicators, and measured in terms of the length of time during which unemployed workers are entitled to benefits (UB duration). Also relevant and available are indicators for the tightness of employment protection legislation (EPL) and for aspects of wage-setting frameworks, such as the percentage of wage-earners who are members of a trade union (TU density) and the extent to which negotiations consider the consequences of wage setting for the whole economy (Coordination). And marginal tax rates (Marginal tax rate), accounting for the percentage of additional earnings that is taxed away, measures a highly relevant aspect of the tax system's income stabilization effects.<sup>7</sup>

Using these seven indicators, we revisit Agell's (2002) specification of empirical relationships over time and across countries between labour market institutions and openness. In Table 5 we report regressions of indicators of labour market institutions on measures of openness and financial market development for 18 OECD countries. (In results that are not reported, the inclusion of controls such as GDP per capita does not affect the estimates.) Interestingly, Part A of Table 5 shows that the correlation of openness with the three indicators of unemployment benefit systems is positive and strongly significant in the pooled panel regressions, and the same is true for trade union density, coordination in wage bargaining, and for the marginal tax rate. The indicator of EPL is also related to openness, albeit more weakly. We have also estimated period-specific cross-sectional regressions. The coefficients of those regressions (not reported) are typically not significantly different from those of the pooled regressions.

Again, aiming at detecting the relevance of financial market development as a substitute for policy measures, Part B of Table 5 reports regressions of labour market regulation indicators on the main and interaction effects of openness and LTV. Significant and positive interactions in the pooled OLS specifications are detected for ALMPs and Coordination. Interestingly, the pooled OLS also estimates a negative and significant interaction effect for tax progressivity. In the fixed-effects specifications, the limited time variability of labour market institutions unsurprisingly makes it difficult to detect significant effects. The inclusion of GDP, which turns out to be almost always insignificant, does not affect these results.

All in all, our exploration of more plentiful and precise data confirms the message of Agell's (2002) estimates of bivariate relationships. The tightness of labour market regulation is positively, albeit weakly, related to openness, suggesting that race-to-the-bottom tendencies are dominated by demand for stronger protection. In contrast to the regressions above on social policy expenditure indicators, little or no evidence is detected of a less positive relationship over time within countries, or of significant interactions

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<sup>7</sup> Data on institutional indicators are from the OECD and several authors (for detailed definitions and sources see the Appendix). Time series for labour market indicators have been compiled according to the following compilation strategy. Data have been interpolated when yearly observations were missing; for years before (after) the first (last) observation available in the subperiod, the value recorded in the first (last) year of observation has been assigned to all years since the start (or to the end) of the subperiod.

with financial market development, with the exception of the marginal tax rate indicator. This may indicate that labour market institutions are less directly relevant than taxation and social spending to labour-income and consumption smoothing and, as they are more stable over time, perhaps less subject to race-to-the-bottom tendencies. Future work could fruitfully explore complementarities and substitutabilities between various institutional aspects of different countries' labour markets.

## **6. Conclusions**

Extending Rodrik's (1998) analysis of the relationship between openness and government size to more numerous and recent periods, and to a more precise measure of public redistribution, we have documented that the association between openness and social spending is positive but has become shallower over time. Extending the specification to indicators of financial development, private financial markets appear to substitute for public redistribution along both the cross-country and time series dimensions.

In cross-section, not only public redistribution but also private financial market transactions tend to increase with international economic openness, addressing the need for consumption smoothing in the presence of international sources of income instability. Systematically different combinations of public schemes and private contracts are observed in countries characterized by different legal and social traditions. When country-specific intercepts control for such permanent differences, we find evidence of a tendency for globalization to be associated with declining generosity of social spending within each country. The tendency is more pronounced in countries where well-developed financial markets absorb a larger proportion of demand for consumption smoothing. As financial markets have become more uniformly well-developed in the OECD, this explains why, in cross-section, public social expenditure has become less positively associated with openness.

Further work aimed at assessing the relative advantages and disadvantages of public and private schemes in different countries, and the economic and political sustainability of economic integration trends, could explore the relevance of our theoretical perspective to income inequality. Bertola (2008) finds that the tighter integration between member countries of Europe's Economic and Monetary Union is associated with less generous social policies and, through that channel, higher income inequality. In broader samples of countries, indicators of economic integration are not tightly correlated to income inequality in theory and empirically, and the co-variation of income inequality and financial development is also ambiguously signed in the data (Clarke, Xu, and Zou, 2003). It would be interesting to see whether clearer results may be obtained by accounting for the relationships, documented in the present paper, among these variables and government policies.

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## APPENDIX

The dataset includes the following variables.

Openness: ratio of imports plus exports to GDP, variable *openc*, “Openness in Current Prices” from the Penn World Tables 6.2.

Government share of GDP: variable *cg* “Government Share of CGDP” from the Penn World Tables 6.2.

Social expenditure: social policy expenditures as a share of GDP, variable built on data from the OECD Social Expenditure database (2007). The expenditure categories included are: 3. Incapacity Related Benefits; 4. Health; 5. Family; 6. Active Labour Market Programmes; 7. Unemployment; 8. Housing; 9. Other social policy areas. We exclude old age and survivor pensions (categories 1 and 2).

Indicators of financial development. Indicators in Table 2 are drawn from the World Bank’s Financial Structure Dataset, as documented in Beck, Demirgüç-Kunt, and Levine (2001); we use the January 17, 2007 revision. Private Credit by Deposit Money Banks as a share of GDP is the variable *pcrdbgdp*. Net Interest Margin is the variable *netintmargin*. The Credit information index is downloadable from the World Bank’s Doing Business website. It assigns a score of 1 for each of 6 features: (1) Both positive and negative credit information is distributed; (2) Data on both firms and individuals are distributed; (3) Data from retailers, trade creditors or utilities as well as financial institutions are distributed; (4) More than 2 years of historical data are distributed; (5) Data on loans above 1% of income per capita are distributed; (6) By law, borrowers have the right to access their data. See also Djankov, McLiesh, and Shleifer (2007). The time-varying indicator for Loan-to-Value ratios is built by interpolating data on maximum LTV ratios reported by the OECD Economic Study by Catte et al. (2004), Jappelli and Pagano (1994), and various sources adding information on countries not accounted for by the OECD (see Lo Prete, 2008).

Labour Market Indicators. The Active Labour Market Programmes (ALMPs) index is the amount of expenditure on ALMPs per unemployed person as a percentage of GDP per member of the labour force (see Lo Prete, 2008). The duration of unemployment benefits (UB duration) measure is based on OECD data on the (monthly) “maximum benefit duration” of entitlement to unemployment insurance (see Lo Prete, 2008). Information on the other five labour market institutions is drawn from the CEP-OECD Institutions Data Set, compiled by LSE (September 2006 release). Gross Replacement Rates (variable *brr\_oecd*) refer to the OECD series, built as the average of benefit replacement rates across the first five years of unemployment for three family situations and two money levels. The Employment Protection Legislation (EPL) indicator (variable *epl*) measures the strictness of mandatory measures that regulate hiring and firing. Trade Union Density (variable *udnet\_vis*) is computed as the percentage of wage-earners who are members of trade unions. The index of Coordination in wage bargaining ranges from 1 to 3 (variable *cowint*). The measure of Marginal Tax Rates is computed as the unweighted average of tax rates paid by a single person on the basis of “total tax payment less cash transfers” rates over four family types (variables *sing1a*, *sing2a*, *sing3a*, and *sing4a* in the CEP-OECD database).

Control Variables. The GDP per capita variable is Real Gross Domestic Product per Capita from the Penn World Tables 6.2 (variable *cgdp*).

**Table A: List of Countries in the Sample**

1.Afghanistan	47.Gambia	93.New Zealand *
2.United Arab Emirates	48.Guinea-Bissau	94.Oman
3.Argentina	49.Greece **	95.Pakistan
4.Antigua and Barbuda	50.Grenada	96.Panama
5.Australia *	51.Guatemala	97.Peru
6.Austria **	52.Honduras	98.Philippines
7.Burundi	53.Haiti	99.Papua New Guinea
8.Belgium **	54.Hungary	100.Poland
9.Benin	55.Indonesia	101.Puerto Rico
10.Burkina Faso	56.India	102.Portugal **
11.Bangladesh	57.Ireland **	103.Paraguay
12.Belize	58.Iran, IslamicRep.	104.Romania
13.Bolivia	59.Iraq	105.Rwanda
14.Brazil	60.Iceland	106.SaudiArabia
15.Bhutan	61.Israel	107.Sudan
16.Botswana	62.Italy **	108.Senegal
17.Central African Republic	63.Jamaica	109.Solomon Islands
18.Canada **	64.Jordan	110.Sierra Leone
19.Switzerland *	65.Japan **	111.El Salvador
20.Chile	66.Kenya	112.Sao Tome and Principe
21.China	67.Cambodia	113.Suriname
22.Coted'Ivoire	68.Kiribati	114.Sweden **
23.Cameroon	69.St.Kitts and Nevis	115.Swaziland
24.Congo.Rep.	70.Korea.Rep.	116.Seychelles
25.Colombi	71.Kuwait	117.Syrian Arab Republic
26.Comoros	72.LaoPDR	118.Chad
27.Cape Verde	73.St.Lucia	119.Togo
28.Costa Rica	74.SriLanka	120.Thailand
29.Djibouti	75.Lesotho	121.Tonga
30.Dominica	76.Morocco	122.Trinidad and Tobago
31.Denmark **	77.Madagascar	123.Tunisia
32.Dominican Republic	78.Maldives	124.Turkey
33.Algeria	79.Mexico	125.Taiwan
34.Ecuador	80.Mali	126.Tanzania
35.Egypt.Arab Rep.	81.Mongolia	127.Uganda
36.Spain **	82.Mozambique	128.Uruguay
37.Ethiopia	83.Mauritania	129.United States **
38.Finland **	84.Mauritius	130.St.Vincent and the Grenadines
39.Fiji	85.Malawi	131.Venezuela
40.France **	86.Namibia	132.Vanuatu
41.Micronesia.Fed.Sts.	87.Niger	133.Samoa
42.Gabon	88.Nigeria	134.SouthAfrica
43.United Kingdom **	89.Nicaragua	135.Congo.Dem.Rep.
44.Germany **	90.Netherlands **	136.Zambia
45.Ghana	91.Norway **	137.Zimbabwe
46.Guinea	92.Nepal	

*Notes:* \* Countries in the 21-country OECD sample. \*\* Countries in the 18-country OECD sample.

**Table 1: Government Policy and Openness: Cross-Sections**

<b>A. Dependent Variable: Log of Government Share of GDP: All countries</b>					
	1980–1984	1985–1989	1990–1994	1995–1999	2000–2003
Log Openness	0.1724 <i>2.98</i>	0.1901 <i>2.88</i>	0.1887 <i>2.87</i>	0.2341 <i>3.38</i>	0.2128 <i>2.62</i>
Constant	2.3430 <i>10.16</i>	2.2532 <i>8.26</i>	2.2721 <i>8.51</i>	2.0523 <i>7.32</i>	2.1339 <i>6.31</i>
Number of obs.	137	137	137	137	137
R <sup>2</sup>	0.0626	0.0670	0.0646	0.0858	0.0504
<b>B. Dependent Variable: Log of Government Share of GDP: OECD countries</b>					
	1980–1984	1985–1989	1990–1994	1995–1999	2000–2003
Log Openness	0.2180 <i>3.34</i>	0.2035 <i>3.27</i>	0.1866 <i>2.44</i>	0.1584 <i>1.74</i>	0.1134 <i>1.10</i>
Constant	2.0250 <i>9.52</i>	2.0287 <i>9.42</i>	2.1068 <i>7.59</i>	2.1814 <i>6.43</i>	2.3601 <i>5.88</i>
Number of obs.	21	21	21	21	21
R <sup>2</sup>	0.1429	0.1298	0.1146	0.0871	0.0464
<b>C. Dependent Variable: Log of Social Expenditure</b>					
	1980–1984	1985–1989	1990–1994	1995–1999	2000–2003
Log Openness	0.4451 <i>5.46</i>	0.4956 <i>7.00</i>	0.3799 <i>3.80</i>	0.3075 <i>3.47</i>	0.2603 <i>2.87</i>
Constant	0.6803 <i>2.28</i>	0.4905 <i>1.71</i>	1.0471 <i>2.61</i>	1.3485 <i>3.84</i>	1.5243 <i>4.24</i>
Number of obs.	21	21	21	21	21
R <sup>2</sup>	0.4030	0.4439	0.2888	0.2911	0.2881

*Notes:* Robust t-statistic in italics.

**Table 2: Private Credit (Volume), Net Interest Margin and Openness: Cross-Sections**

**A. Dependent Variable: Log of Private Credit (Volume)**

	Log of Private Credit,1980	Log of Private Credit,1985	Log of Private Credit,1990	Log of Private Credit,1995	Log of Private Credit,2000
Log Openness	0.1084 <i>0.76</i>	0.2315 <i>1.33</i>	0.2025 <i>1.08</i>	0.2995 <i>1.29</i>	0.4240 <i>1.68</i>
Constant	-1.8204 <i>-2.98</i>	-2.2338 <i>-2.97</i>	-2.0574 <i>-2.61</i>	-2.4918 <i>-2.52</i>	-2.8812 <i>-2.61</i>
Number of obs.	93	93	93	93	93
R <sup>2</sup>	0.0060	0.0223	0.0140	0.0204	0.0386

**B. Dependent Variable: Net Interest Margin**

	Net Interest Margin 1995	Net Interest Margin 2000
Log Openness	-0.0073 <i>-1.14</i>	-0.0096 <i>-1.47</i>
Constant	0.0837 <i>3.11</i>	0.0913 <i>3.22</i>
Number of obs.	94	94
R <sup>2</sup>	0.0130	0.0203

*Notes:* Robust t-statistic in italics.

**Table 3: Government Policy, Openness and Financial Market Indicators: Cross-sections****A. Dependent Variable: Log of Government Share of GDP, All countries**

	1980–1984	1985–1989	1990–1994	1995–1999	2000–2003
Log Openness	0.1958 <i>2.04</i>	0.2361 <i>2.22</i>	0.2490 <i>2.59</i>	0.3464 <i>3.25</i>	0.3447 <i>2.66</i>
CredInfo	0.0446 <i>0.51</i>	0.0829 <i>0.80</i>	0.1107 <i>1.11</i>	0.1982 <i>1.92</i>	0.2350 <i>1.99</i>
Openness *CredInfo	-0.0229 <i>-1.08</i>	-0.0323 <i>-1.31</i>	-0.0387 <i>-1.61</i>	-0.0608 <i>-2.49</i>	-0.0694 <i>-2.52</i>
Constant	2.3656 <i>5.86</i>	2.1854 <i>4.75</i>	2.1414 <i>5.19</i>	1.7102 <i>3.70</i>	1.7091 <i>2.98</i>
Number of obs.	137	137	137	137	137
R <sup>2</sup>	0.1225	0.1327	0.1368	0.1836	0.1375

**B. Dependent Variable: Log of Social Expenditure, OECD countries**

	1980–1984	1985–1989	1990–1994	1995–1999	2000–2003
Log Openness	0.1320 <i>0.16</i>	0.4596 <i>0.65</i>	0.6824 <i>0.60</i>	1.9019 <i>2.11</i>	1.3438 <i>0.83</i>
LTV	-0.0001 <i>-0.00</i>	0.0137 <i>0.37</i>	0.0320 <i>0.56</i>	0.0777 <i>1.78</i>	0.0433 <i>0.64</i>
Openness*LTV	0.0036 <i>0.31</i>	0.0002 <i>0.02</i>	-0.0038 <i>-0.25</i>	-0.0178 <i>-1.69</i>	-0.0110 <i>-0.69</i>
Constant	0.9479 <i>0.31</i>	-0.4411 <i>-0.16</i>	-1.5015 <i>-0.34</i>	-5.5660 <i>-1.51</i>	-2.7498 <i>-0.40</i>
Number of obs.	18	18	18	18	18
R <sup>2</sup>	0.6436	0.7751	0.6468	0.4234	0.3619

*Notes:* Robust t-statistic in italics.

**Table 4: Government Policy, Openness and Financial Market Indicators: Panel Analysis (1980–2003)**

**Dependent Variable: Log of Social Expenditure, OECD countries**

	Pooled-OLS	Random Effects	Fixed Effects		First differences
Log Openness	0.9613 <i>3.10</i>	0.9140 <i>4.51</i>	0.6734 <i>2.76</i>	$\Delta$ Log Openness	0.1530 <i>0.81</i>
LTV	0.0413 <i>2.55</i>	0.0423 <i>4.33</i>	0.0418 <i>4.29</i>	$\Delta$ LTV	0.0220 <i>2.59</i>
Openness*LTV	-0.0077 <i>-1.85</i>	-0.0091 <i>-3.77</i>	-0.0089 <i>-3.55</i>	$\Delta$ (Openness*LTV)	-0.0051 <i>-2.24</i>
Constant	-2.1440 <i>-1.78</i>	-1.5859 <i>-1.97</i>	-0.6410 <i>-0.68</i>	Constant	0.0435 <i>2.41</i>
Number of obs.	90	90	90	Number of obs.	72
R <sup>2</sup>	0.5725	-	0.3020	R <sup>2</sup>	0.1060

**Notes:** Robust t-statistic in italics. The Hausman test rejects the hypothesis that the difference in coefficients between Fixed Effects and Random Effects is not systematic ( $\chi^2(3)=9.23$ , Prob.>  $\chi^2=0.0264$ ).

**Table 5: Labour Market Institutions, Openness and Financial Market Indicators:  
Panel Analysis**

**A. Labour Market Institutions and Openness: OECD sample**

	ALMPs	GRRs	UB duration <sup>a</sup>	EPL	TU density	Coordination	Marginal tax rate
Log Openness	8.9929	17.0995	1.7501		18.4758	0.4372	12.4274
	<i>5.76</i>	<i>9.81</i>	<i>4.07</i>	<i>0.1134</i>	<i>6.34</i>	<i>3.27</i>	<i>6.71</i>
Constant	-	-	-5.2034		-	0.3000	-
	22.3263	39.8605		0.2999	31.7366		11.9846
	<i>-3.90</i>	<i>-5.80</i>	<i>-3.18</i>	<i>0.86</i>	<i>-2.79</i>	<i>0.54</i>	<i>-1.57</i>
Number of obs.	77	90	72	82	81	82	80
R <sup>2</sup>	0.1070	0.3843	0.3061		0.1912	0.1438	0.3668
				0.0249			

**B. Labour Market Institutions, Openness and Financial Market Indicators: OECD sample**

	ALMPs	GRRs	UB duration <sup>a</sup>	EPL	TU density	Coordination	Marginal tax rate
Log Openness	-	34.2074	3.2357	-	5.8699	-1.9898	27.2330
	20.6701			0.1201			
	<i>-1.79</i>	<i>2.74</i>	<i>1.02</i>	<i>-0.32</i>	<i>0.25</i>	<i>-3.55</i>	<i>3.28</i>
LTV	-0.9930	1.1916	0.0894	-	-0.7059	-0.1318	1.0051
				0.0284			
	<i>-1.83</i>	<i>1.91</i>	<i>0.64</i>	<i>-1.47</i>	<i>-0.63</i>	<i>-4.73</i>	<i>2.42</i>
Openness*LTV	0.3449	-0.2286	-0.0186		0.1578	0.0304	-0.1934
				0.0035			
	<i>2.37</i>	<i>-1.45</i>	<i>-0.50</i>	<i>0.73</i>	<i>0.52</i>	<i>4.27</i>	<i>-1.82</i>
Constant	64.8775	-	-		24.5690	10.7850	-
		129.7756	12.3381	2.3726			89.4921
	<i>1.49</i>	<i>-2.62</i>	<i>-1.02</i>	<i>1.59</i>	<i>0.28</i>	<i>4.98</i>	<i>-2.82</i>
Number of obs.	77	90	72	82	81	82	80
R <sup>2</sup>	0.2228	0.4666	0.3250		0.1949	0.2882	0.4517
				0.2419			

**Notes:** Robust t-statistic in italics. (a) Regressions are run starting from the sub-period recording the first observation available for UB duration (1985–1989).

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