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Inequality, Globalization, and Financial Development
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Economic integration and financial development both interact with income inequality within each country. This paper briefly reviews the relevant theoretical and empirical literature and uncovers suggestive new evidence in an unbalanced panel data set of country-specific observations. Controlling for country characteristics, trade openness and an indicator of financial development are both associated with higher income inequality. But trade openness appears to be related to inequality mostly through interactions with public expenditure, which tends to be less strongly associated with lower inequality when trade openness is higher. The estimates sensibly suggest that economic integration may make it more difficult for governments to address distributional issues left unsolved by incomplete and imperfect private financial markets.

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1. The issues

Removal of barriers to trade and to factor mobility implies new opportunities for the economic agents of previously isolated economies. As goods and factors flow across previously closed borders, efficiency should increase over that of previous and still feasible production and consumption patterns. In an otherwise perfect world, economic integration of countries would increase aggregate welfare, as broader markets afford more efficient trade and better specialization. Economic integration also affects the distribution of income, however, and that of consumption and welfare in our world of imperfect markets.

Gains from trade do not necessarily increase income equally across countries, of course, and this may partly explain patterns of trade liberalization and growth dynamics.[1] From the standpoint of a hypothetical "global" individual concerned with both the average and the dispersion of income, it may also be interesting to assess how inequality evolves across individuals in all countries.[2] But the impact of economic integration on distribution within each country has much more important implications, because policy is decided and implemented at the country level.

Removing obstacles to trade makes it possible to choose the cheapest producers. While all individuals benefit from this as consumers, some producers may be damaged by diversion of trade from within to across countries' borders. Trade is grounded in diversity, and within each country each individual brings different goods and factors to the market. Income will increase with economic integration for those who can compete more successfully in the wider market, but will decrease for those who can be efficiently substituted by foreign producers, and all producers may be subject to the more frequent and intense demand shocks originating from a broader and more diverse set of foreign markets.

The different impact of economic integration on different countries' aggregate income can be offset by appropriate side payments in the context of trade liberalization negotiations. But reluctance to accept economic integration is justifiable if individuals

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[1] The income distribution effects of economic integration are not so strong empirically as to emerge clearly alongside that of technological progress, demographic developments, welfare and education systems, and financial market structures. Frankel and Romer (1999) study the relationship between per capita income dynamics and "natural" sources of economic integration, such as countries' size, location, and language. Slaughter (2001) focuses instead on the policy variation across countries generated by participation in multilateral liberalization rounds, but finds that indicator's relationship to per capita income is both theoretically and empirically ambiguous.

[2] Sala-i-Martin (2006) argues that global inequality has been falling as a consequence of per capita income growth in large and relatively poor countries, such as India and China.

within each country face uncertain outcomes in the aftermath of reform (Fernandez and Rodrik, 1991). And such worries are stronger if the collective country-specific policy instruments that may address distributional concerns are undermined, within each country, by international arbitrage and "race to the bottom" tendencies in a context of integrated markets without an integrated policy-making framework. To the extent that the welfare implications of income shocks cannot be smoothed by suitable financial market or policy instruments, and that distributional concerns shape country-level decisions to accept removal of trade and factor movement barriers across the borders of political entities, the interaction between financial market and political income-smoothing instruments may explain why economic integration is still incomplete and problematic after many decades of globalization.

The next Section reviews historical patterns, conceptual issues, and theoretical insights regarding the interaction of economic integration with within-country inequality. Section 3 discusses the role in this context of financial market imperfections and of redistributive and insurance-oriented policies. Section 4 reviews existing evidence and proceeds to assess the empirical relevance of interaction effects in a panel data set of country-specific observations. Section 5 offers concluding thoughts.

2. Income inequality and globalization: facts and mechanisms

Different empirical measures of income distribution are relevant for different purposes (Ravaillon, 2004). Relative measures of inequality that remain unchanged as all incomes grow, and may index a country's overall degree of social cohesion; but absolute poverty rates may better measure incentives to engage in disruptive (criminal, or revolutionary) activities. More importantly, income inequality that is foreseeable and permanent should be distinguished, in theory and in empirical measurement, from inequality that may be feared ex ante and is realized ex post as a consequence of unforeseen shocks. Consumption inequality and instability are of course most directly relevant to welfare, and are related to their income counterparts to the extent to which saving and portfolio choices can insulate individual welfare from income fluctuations.

An increasingly clear history of within-country inequality has been emerging from recent work on the scarce and imperfect indicators available (Atkinson and Piketty, 2007). Income inequality in advanced countries was high at the beginning of the 20th century, but declined sharply during the World Wars and until the 1970s. It began to increase again around 1980. It is tempting to associate this U-shape path with the superficially similar one followed by global economic integration, which was sharply lowered by wartime and Great Depression trade and migration restrictions, and rose again towards and beyond earlier levels at the turn of the next century (see O'Rourke, 2001, for a review of the available indicators). It is also interesting to note that while in

early data income inequality largely reflected the unequal distribution of financial and land wealth, increasingly diverse labor incomes are a key determinant of recent inequality developments, and that an important portion of earnings dispersion is accounted for by the increasing relevance of education in the determination of pay and employment opportunities.

Theory has no general and unambiguous predictions as to the relationship between economic integration and income inequality, because relatively rich or relatively poor producers may benefit or loose in the aftermath of economic integration. Observed patterns, however, are consistent with realistic mechanisms. In the Heckscher-Ohlin framework, for instance, where factor endowments are the only reasons why incomes differ and countries trade, the factors owned by high-income countries and individuals are scarcer in the integrated economy than in the rich country, and integration is expected to increase inequality in rich countries While poor citizens of rich countries suffer the competition of many similar individuals from poor countries, their richer compatriots' enjoy the cheaper prices of services supplied by individuals at the bottom of poor countries' income distribution, and can invest their wealth in poor countries' high-return projects. Since skilled labor is complementary to less-developed country labor, international economic integration should indeed increase wage inequality in rich countries, and employment of low-paid workers should decline in countries where low wages cannot fall. Consistently with this mechanism, the level and the rate of change of earnings inequality are both higher in countries where the structure of earnings is left to market determination, and the same is true of unemployment rates in more heavily regulated countries. Over the last three decades of the 20th century unemployment displayed a trend increase in Continental European countries but remained trendless in the United States and other Anglo-Saxon countries, while earnings inequality remained stable (or even declined) in the former group of countries but trended upward in the latter.

More generally, income distribution depends on the amount of factors owned by each individual as well as on those factors' rate of return. If income inequality reflects concentrated ownership of land and natural resources (which, unlike physical and human capital, may be scarcer in the global economy than in poor countries), integration increases inequality in poor countries, as it makes it possible to obtain larger rewards from the larger amounts of those factors owned by their rich citizens. When more than two factors are used in production, moreover, they can be complementary rather than substitutable across borders. Since economic integration can exploit complementarity as well as substitution when more factors are considered, its effects on

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factor pay are in general ambiguous.[3] For example, if countries differ not only in terms of capital availability or technological efficiency, but also in terms of the mix of skilled and unskilled labor, then integration makes it possible for a poor country's skilled labor to work with the rich country's complementary capital rather than with substitutable unskilled labor, and wage inequality will increase in the poor country rather than only in the rich country.

It is also important to note, for both theoretical and empirical purposes, that only a portion of the observed income inequality reflects permanent characteristics of individuals. Another portion reflects fluctuations of income around an individual's average income, and the resulting non-permanent volatility may or may not (depending on the structure of financial markets and redistributive policies) imply welfare-reducing consumption volatility. If reallocation towards higher-paying jobs is costly, labor mobility cannot arbitrage away job-specific wage differentials. Instability of labor demand then implies wage differentials that are not only more volatile, but also more widely distributed at a point in time because wage differentials need to be larger, in order to motivate mobility, when they are less permanent. Wider and more volatile wage differentials have important welfare implications when individual workers cannot rely on private financial instruments or collective schemes in order to finance their mobility towards higher-paying jobs. In fact, earnings and consumption track each other quite closely at the individual level, especially at the low end of their distributions (see Blundell Pistaferri and Preston, 2008, and their references). The impact of integration on risk and uncertainty is also ambiguous in theory, because foreign shocks may be negatively correlated to those that originate in the domestic economy, and while barriers to trade and factor mobility protect domestic producers from external shocks, they also remove channels of adjustment to internal shocks.

3. Finance and policy

Economic integration affects the distribution of income across economic agents, in ways that increase income's inequality or instability within some countries. This makes it more important for individuals to rely on consumption smoothing instruments, whether through private contracts or public redistribution schemes.

When income is more volatile over the course of an individual's lifetime, financial markets may not be sufficiently well developed to afford consumption smoothing, with negative effects on the welfare of risk-averse individuals. Better financial markets tend to improve welfare, but financial market imperfections can affect income distribution

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[3] O'Rourke (2001) offers a clear discussion of theoretical mechanisms and of their historical relevance.

through a variety of channels. Self-financing constraints imply that investment returns are larger for the savings of poorer people, so they tend to reduce inequality, but access to non-contingent borrowing implies wider and persistently increasing inequality in the presence of uninsurable shocks, and stock-market access can increase income inequality by encouraging risk-taking behavior (Bertola, Foellmi and Zweimueller, 2006, chapter 7-9). And different financial market imperfections also have specific implications for the inequality impact of economic integration. If income is higher and returns to investment lower where more capital is available, integration should reduce inequality: production should grow faster in initially capital-poor locations than in initially rich ones, as investment takes advantage of higher marginal productivity in the former and savings flows out of the latter. Financial (rather than trade) integration also has implications for within-country inequality. In autarky, financing difficulties that prevent borrowing tend to boost aggregate savings and decrease the rate of return on investment. Upon integration, the rate of return falls in financially developed countries, and rises in underdeveloped countries, thereby increasing the relevance of wealth levels and increasing income inequality (Mendoza, Quadrini, and Ríos-Rull, 2007).

When private markets are imperfect public policies may target inequality and consumption volatility. Reducing *ex ante* inequality can be desirable in order to foster social cohesion, and redistribution policies can offset *ex post* income shocks when information and implementation problems prevent insurance markets from smoothing out they welfare impact. Redistribution policies are more appealing when financial markets make it difficult for individuals to self-insure (Bertola and Koeniger, 2007), but it usually comes at some cost in terms of efficiency. If available information does not make it possible to disentangle the roles of luck and effort then redistribution, at the same time as it reduces the role of luck in the determination of individual welfare, unavoidably relaxes the connection between individual effort and individual income, and decreases average production (Bertola and Koeniger, 2008). Imperfect information about effort and/or about personal characteristics makes it impossible for redistribution policies to erase the effects of luck without also decreasing incentives to provide effort.

Imperfect markets and imperfect policies together determine how the costs and benefits of change are shared across individuals, and the pros and cons of redistribution and risk-sharing institutions depend on structural features. The extent to which efficiency losses may offset insurance benefits depends in general on the structure of economic interactions. Economic integration improves efficiency because it offers more choices to individuals but, for the same reason, it also makes it more difficult for policies to shape individual choices differently from what would be implied by market mechanisms. To be effective, policies need to rely on compulsory rules and legal entitlements based on collective rather than on individual choices. They are weakened when international economic relationships offer opportunities to opt in and out of

welfare schemes. National tax policies face more elastic disappearance of tax bases when potential taxpayers can move income to other constituencies, rather than just reduce labor supply. National subsidy policies are more expensive when they attract recipients from other constituencies. The collective bargaining power of national unions is also reduced by employers' better outside options, and not only market shocks but also policy instruments have stronger effects on wages or employment when factors can be substituted in production across country borders.

Thus, wider but incomplete markets alter the balance of policies' positive and negative effects. For example, the impact of immigration may or may not make poverty relief more important for domestic low-skill workers: the effect on their incomes depending on whether the skill mix of immigrants is complementary or substitutable to theirs. But if immigrants can draw welfare benefits, immigration certainly makes welfare systems more expensive or less generous. From this perspective, concerns about the implications of globalization are justified. Redistribution could in principle ensure that nobody is damaged by efficient economic integration, but redistribution requires instruments that are blunted by the fact that economic integration makes it more difficult for policy to function within each country.

4. Evidence from a panel of countries

As discussed above, the effects of economic integration on income distribution are theoretically well understood, but not unambiguous. In theory, various possible outcomes reflect structural features such as complementarity, substitutability, and returns to scale. In reality, the income distribution implications of new market interactions depend on the practical relevance of such features. Whether and how globalization matters for inequality is therefore an empirical question, but theory indicates that answer depends on the circumstances in which deeper economic integration takes place.

Existing empirical work is suggestive but not conclusive as regards the relationships of interest. Lundberg and Squire (2003) and Clarke, Xu and Zou (2003) find that, across countries, larger volumes of credit are associated with lower levels of income inequality. Controlling for initial cross-country differences in inequality and period-averaged openness, as well as for real income growth but not for levels, Beck, Demirguc-Kunt and Levine (2004) relate credit development (on a period-averaged basis) to changes of inequality and poverty indicators. Bonfiglioli (2005) explores the relationship between stock market development and inequality, and finds that countries with larger stock market capitalization generally feature less inequality. The risks entailed by international trade and specialization may lead more open countries to engage in more pervasive interference with market-driven income distribution processes. Empirically, this is the case in the data analyzed by Rodrik (1998), Agell

(2002), and others. But while economic integration may foster demand for income redistribution and other means of offsetting uninsurable income shocks, it also makes it more difficult and expensive to implement such policies. Bertola and Lo Prete (2008) find that, in specifications with country fixed effects, increasing openness is associated with smaller government size and lower social expenditure, consistently with the notion that 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; Bertola, 2007). They also find that the effect is more pronounced in countries with more accessible household financial markets. Since part of the observed heterogeneity in financial market development across countries may reflect exogenously different effectiveness of legal and administrative frameworks in supporting markets and administrations (La Porta et al., 1998), a stronger tendency for globalization to erode government policies is not surprising in countries where financial markets are make it less necessary to rely on government redistribution in order to smooth consumption.

This section explores the relationships between a standard set of inequality measures and indicators of trade integration and financial development. As briefly discussed above, both economic integration and financial development are ambiguously related to inequality in theory, and available indicators may or may not correspond to interesting theoretical concepts. A portion of observed income inequality indicators and trends is accounted for by the changing relevance of permanent skill characteristics, another may at a point in time reflect random events, and a particularly important component may reflect redistribution policies. All of these components are theoretically influenced by deeper international integration. Trade can affect inequality through relative labor demand across skill levels and also through stronger instability of relative demand across industries, regions, and occupations. As to the impact of policy, more intense product market competition increases the responsiveness of labor demand to labor costs, and to productivity and product-demand shocks.

The relationship of interest has the form

$$Inequality = f(Openness, Finance, Policies, Structure),$$

and the specification of $f(\cdot)$ should, in light of the theoretical insights discussed above, feature interaction effects representing the influence of each right-hand side variable on the effect that others variables exert on inequality. This general approach inspires the simple regressions, reported below, on empirical counterparts to the theoretical concepts of interest.

4.1 Data

As to the left-hand-side variable, a large number of Gini coefficient observations are available from the UNU-WIDER World Income Inequality Database (V 2.0b, May 2007). These are drawn from a large number of different data sets. Since the definition and quality of such "secondary" data varies widely across observations, so any results obtained from their analysis have to be taken with a large grain of salt.[4] But any data are better than no data, and cross-country panel data offer more information about broad trends and relationships than single-country microeconomic datasets, where the impact of economic integration on the phenomena of interest may not be independent of country-specific circumstances.

Observations in the lowest two (of four) quality categories in the dataset are dropped. When more than one measure of inequality is available for a given country and year, inequality in terms of adjusted disposable income at the household level is retained, as it may be the most relevant, among available indicators, to the theoretical welfare notion. To enlarge the sample, it is possible to include also observations where inequality is measured in terms of gross income and/or at the personal level, and control for the different definition of the Gini coefficient on the left-hand side with simple additive dummies equal to one if inequality is measured on a gross-income basis, and if it is measured across persons rather than families. This is of course far from being fully satisfactory (see Atkinson and Brandolini, 2001, for a general discussion), in particular because the difference between gross and net income inequality is influenced by the different intensity of redistribution proxied by other regressors. But selecting samples according to availability of indicators turns out not to be innocuous either: for example, countries with larger governments are significantly more likely to report inequality across persons, rather than households. Results are however broadly similar for many possible samples. Differences are mostly found in the sign and significance of openness as an explanatory variables for inequality: that relationship is both theoretically and empirically influenced by interactions and controls, and the estimates of the most robust specification are very similar when regressions are run only on observations with inequality indicators all defined in terms of disposable, household-level income, or of person-level indicators (see below for an illustrative example of such regressions).

As to explanatory variables, two indicators are taken from the Penn World Tables: openness, measured in terms of export and import volumes as ratios of GDP as it is common in the literature;[5] and the role of policies, proxied by the share of government

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[4] Atkinson and Brandolini (2001) discuss and criticize evidence drawn from an earlier release of this dataset.

[5] Spilimbergo, Londoño, and Székely (1999) carefully examine the influence of various indicators of (policy-based) economic integration on income inequality. They find that the

in GDP. There is little doubt that social policy is associated with lower inequality (see Bertola, 2008, for an application to EMU and EU countries), and similar relationships with inequality can be detected in the data when more general forms of government spending are considered (see Afonso, Schuknecht, and Tanzi, 2008). The role of private financial markets can be proxied by the ratio of private credit to GDP, a common *de facto* indicator of the depth and efficiency of financial markets that is available for a large sample of countries in the World Bank's Financial Structure Dataset documented in Beck, Demirgüç-Kunt, and Levine (2000; the January 17, 2007 revision and update is used in the regressions reported here). Many other country-specific structural features are of course potentially relevant, and for this reason it will be important to compare results of regressions with and without country fixed effects.

4.1 Results

Tables 1-4 report estimates from a variety of specifications. Among countries for which inequality and financial development indicators are available, only Luxembourg features openness observations larger than 200%. That small country's 6 observations are dropped in the regressions reported below; results are essentially identical if they are included. After dropping countries for which only a single observation is available (in order to prevent sample selection from affecting comparisons of pooled and fixed-effects regression results), the sample includes 467 country-year observations, heavily unbalanced and irregularly spaced over time (countries and years available are listed in the Appendix).

The pooled OLS regressions of Tables 1 and 2 allow cross-sectional variation to bear on the results, hence they suffer from omitted variable bias if (as it is likely) countries differ permanently in relevant respects not controlled by the regressors included. The interpretation of the results is also subject to the Rodrik (2005) critique: to the extent that regressors are endogenously chosen by politico-economic mechanisms, and influenced by country-specific inequality conditions, it would be wrong to draw any causal implications from these partial correlations.

 It is consistent with this criticism to find that the estimated coefficients differ very substantially between Table 1, which only includes the regressors of interest and their interactions, and Table 2, where GDP per capita is included. Since income levels are arguably influenced by the same historical, social, and geographical country characteristics that shape policies and inequality, the strong significance of per capita GDP in pooled OLS estimates confirms that countries and their regressors are

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relationship is more complex than it would be predicted by the Hecksher-Ohlin framework, in that the impact of integration on factor prices does not appear to depend on relative development levels; in their data and empirical specifications, the combined implications of various effects lead integration to have no impact on income distribution in industrial countries.

heterogeneous in important ways that are related to the phenomena of interest. For example countries that are exogenously more productive and socially cohesive may find it easier to care for the poor, and display more generous social policy as well as more openness and lower inequality.

While similar concerns may be expressed about fixed-effects estimates, focusing on within-country variation delimits the scope of possible feedback effects to those that happen dynamically over time. Interestingly, in the fixed effects regressions of Table 4 GDP per capita (in terms of its variation over time for a given country, i.e. growth) is not significant, and the pattern of coefficients is essentially the same regardless of whether it is included (Table 4) or not (Table 3). The coefficients are indeed remarkably similar when interaction effects are allowed for in column (4) of Tables 3 and 4. On the basis of this informal specification check, the fixed-effects regressions of Table 3 appear robust enough to warrant detailed discussion.

Column (1) of Table 3 displays a positive association between inequality and trade openness, but the coefficient is insignificant after controlling for financial development. In column (2), the size of government is found to be negatively associated with inequality, financial development is positively associated with it: both relationships are strongly significant, and the slope of the residual relationship between trade openness and inequality is precisely estimated to be zero.

Government size has an important role as an explanatory variable for inequality: including it reduces the significance of the (negative) coefficient of openness in pooled regressions, and makes it completely insignificant in fixed-effects regressions. It is therefore worthwhile to characterize empirical patterns of variation for government size and openness. As shown in column (3) of Tables 1 and 2, in the absence of country fixed effects government expenditure is positively related to openness (as originally found and discussed by Rodrik, 1998). In the fixed effects specification reported in column (3) of Tables 3 and 4, government size is instead negatively related to openness: as discussed in Bertola and Lo Prete, this may indicate that increasingly intense international competition makes taxation more difficult and, more generally, reduces the effectiveness of country-level policies. In fact, the interaction between government spending and openness has a positive and significant coefficient as an explanatory variable for inequality, in both pooled and fixed-effects specification. Focusing on the preferred specification reported in column (4) of Table 4, finding that government expenditure is less effective (has a less negative effect on inequality) in more open economies is fully consistent with race-to-the-bottom mechanics, and with the fact that openness reduces government size in column (3) of the same table.

In the pooled specifications of Tables 1 and 2, as in the specification chosen by Beck, Demiguc-Kunt, and Levine (2004), financial development is negatively associated with

inequality. But the opposite is true in the arguably sounder fixed-effects specifications of Tables 3 and 4, and the preferred interacted regressions reported in column (4) also features a negative and significant coefficient for the interaction between financial development and openness.

Recalling that financial development measured on a 'de facto' basis reflects both supply and demand influences, the estimates may indicate that more efficient financial transactions can ease the inequality impact of economic integration, but may also reflect the fact that more pronounced income volatility leads to a larger volume of transactions for given financial market efficiency (see Iacoviello, 2008, for theory and US evidence). Other interpretations are possible, however, and the sign and significance of interaction coefficients are much less robust in the case of financial development than in the case of government expenditure. In general, financial market development smoothes consumption patterns but, as discussed above, does not necessarily reduce income inequality, and it is hard to see why they should do so in particular for more open economies.[6]

To check against the possible spurious effects introduced by the heavily unbalanced shape of the panel, and by the imperfect control afforded by additive dummies on heterogeneously defined left-hand side variables, Table 5 reports regression results for a sample including only observations where Gini coefficients are defined in terms of disposable income at the household level, and only the first and the last observation available for each country. Coefficients are much less precisely estimated in such a small sample when interactions are omitted but, while noisy, empirical patterns in the data are broadly in line with the partial correlations implied by the regression. The estimates are extremely similar to that obtained on the larger sample for the regression reported in column (2), which includes interaction effects. Figure 1 and 2 plot partial correlations from the regressions reported in Table 5, and show that interaction effects fit empirical patterns remarkably well.

It is particularly interesting to assess how the overall effect of openness on inequality is shaped by interaction coefficients applied to country-specific financial development and government policy indicators. The small size of the sample makes it possible to appreciate the role of interaction coefficients results graphically. Figure 3 plots, for

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[6] Allowing for a nonlinear impact of financial development on inequality (as suggested by Bonfiglioli, , 2005) yields a negative and significant coefficient for the square of the credit/GDP ratio. In that regression, the point estimates are not such as to imply that any reasonable level of financial development has a negative association with inequality, but the interaction between financial development and openness is not significant. It would be interesting, but probably not warranted by the quality of the data, to allow for further nonlinearities, such as an interaction of (financial) openness with both the level and the square of debt stocks to see whether integration has different implications for income inequality in countries with more or less developed internal financial markets, as suggested by the Mendoza, Quadrini, and Rios-Rull's (2007) framework.

each country in the sample, the two available data points and the slope, as implied by the country-specific financial development indicator, of the relationship between openness and inequality. The predictions plotted of course depend on all the covariates included in the specification of column (2) in Table 5, and cannot be interpreted at the individual country level. Still it is interesting to see that in most cases the regression fits the observations remarkably well, and that the slope is positive in a country such as the US, with well developed financial markets and small government, and negative in a country such as Italy, with tighter credit (but expanding) credit and larger government size.

5. Concluding comments

Broader and deeper markets are more powerful both in generating strong incentives and high production, and in allowing individual choice to circumvent policies meant to offset undesirable aspects. More widely integrated markets react more promptly and more sharply to differences in prices. This fosters efficiency, but also implies that small cost shocks can have dramatic effects on production, and can increase the risk faced by producers in more open economies (Scheve and Slaughter, 2004). Even though integration is beneficial on average, the average individual may well oppose to it in light of uncertainty about whether one will find him or herself above, or much below, the average of income changes.

Opposition to economic integration may reflect fears that unconstrained market interactions across borders would, in the absence of appropriately coordinated regulation, foster market failures. Structural change can change the efficiency impact of institutions meant to redistribute income and remedy financial market imperfection, or can make them redundant if, for example, financial market development makes labor income fluctuations less problematic. But as long as policy addresses economic and political problems left unsolved by imperfect markets interactions, then barriers to economic interactions across the boundaries of political constituencies are natural elements of policy intervention packages.

Further work could bring this perspective to bear on the role of more detailed policy instruments than the size-of-government indicator used in this paper's simple regressions (Checchi and Garcia Penalosa 2008, for example, study the relationship between labor market institutions and total income inequality, and their findings could be related to international sources of risk and inequality as suggested by Agell, 2002).

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Table 1: Pooled OLS regressions

	(1) Inequality	(2) Inequality	(3) Govt.share of GDP	(4) Inequality	(5) Inequality
Dependent Variable:					
Trade openness	-0.0310	-0.0153	0.1287	-0.2102	-0.1033
	-2.95	*-1.34*	*7.60*	*-4.10*	*-5.18*
Financial development	-0.0603	-0.0739	-0.0007	-0.1947	-0.1670
	-5.03	*-5.12*	*-0.04*	*-6.92*	*-6.72*
Govt.share of GDP		-0.2069		-0.5240	
		-2.68		*-3.12*	
Openness*Fin.dev.			-0.0010	0.0018	0.0014
			-3.14	*5.39*	*5.41*
Openness*Govt.				0.0049	
				2.68	
Dummy: Gross income inequality	12.7330	12.8907		13.2432	12.6968
	11.52	*11.76*		*12.34*	*12.15*
Dummy: Persons inequality	0.3839	0.8519		1.5372	0.2519
	0.51	*1.09*		*1.97*	*0.33*
R^2	0.29	0.30	0.35	0.33	0.32

Note: All regressions include a constant; robust *t* statistics are shown in italics below the coefficients.

Table 2: Pooled OLS regressions, controlling for GDP

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Inequality	Inequality	Govt.share of GDP	Inequality	Inequality
Trade openness	-0.0276	-0.0069	0.1303	-0.1881	-0.0984
	-2.62	*-0.61*	*7.97*	*-3.65*	*-4.97*
Financial development	-0.0116	-0.0254	0.0117	-0.1393	-0.1167
	-0.84	*-1.70*	*0.65*	*-4.75*	*-4.53*
Govt.share of GDP		-0.2680		-0.5603	
		-3.56		*-3.20*	
Openness*Fin.dev.			-0.0010	0.0016	0.0014
			-3.28	*5.01*	*5.41*
Openness*Govt.				0.0046	
				2.44	
GDP per capita	-0.4155	-0.4483	-0.0975	-0.4308	-0.4104
	-5.11	*-5.52*	*-2.77*	*-5.57*	*-5.24*
Dummy: Gross income inequality	9.7749	9.7457		10.1965	9.7763
	7.28	*7.26*		*7.76*	*7.59*
Dummy: Persons inequality	0.6650	1.2932		1.9131	0.5323
	0.86	*1.62*		*2.40*	*0.69*
R^2	0.34	0.35	0.36	0.38	0.36

Note: All regressions include a constant; robust *t* statistics are shown in italics below the coefficients.

Table 3: Regressions with fixed country effects

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	Inequality	Inequality	Govt.share of GDP	Inequality	Inequality
Trade openness	0.0060	-0.0002	-0.0307	-0.0906	0.0409
	0.36	*-0.01*	*-2.28*	*-2.25*	*2.01*
Financial development	0.0268	0.0250	-0.0143	0.0559	0.0754
	3.59	*3.55*	*-1.26*	*3.00*	*3.80*
Govt.share of GDP		-0.2156		-0.6696	
		-3.13		*-3.81*	
Openness*Fin.dev.			0.0001	-0.0003	-0.0006
			0.79	*-1.85*	*-2.88*
Openness*Govt.				0.0060	
				3.05	
Dummy: Gross income inequality	3.4883	3.1448		3.4189	3.7689
	4.32	*3.82*		*4.11*	*4.45*
Dummy: Persons inequality	-1.4811	-1.3467		-1.0722	-1.5098
	-1.36	*-1.25*		*-0.99*	*-1.39*
R^2	0.07	0.09	0.03	0.14	0.09

Note: Robust *t* statistics are shown in italics below the coefficients.

Table 4: Regressions with fixed effects, controlling for GDP

Dependent Variable:	(1) Inequality	(2) Inequality	(3) Govt.share of GDP	(4) Inequality	(5) Inequality
Trade openness	0.0099	0.0039	-0.0315	-0.0785	0.0502
	0.58	*0.23*	*-2.16*	*-1.96*	*2.35*
Financial development	0.0321	0.0307	-0.0154	0.0673	0.0882
	3.73	*3.75*	*-1.19*	*3.37*	*4.16*
Govt.share of GDP		-0.2184		-0.6560	
		-3.16		*-3.76*	
Openness*Fin.dev.			0.0001	-0.0004	-0.0007
			0.79	*-2.13*	*-3.15*
Openness*Govt.				0.0058	
				2.97	
GDP per capita	-0.0477	-0.0513	0.0056	-0.0589	-0.0695
	-1.11	*-1.23*	*0.19*	*-1.44*	*-1.57*
Dummy: Gross income inequality	3.3407	2.9815		3.2577	3.5831
	4.01	*3.50*		*3.81*	*4.14*
Dummy: Persons inequality	-1.3378	-1.1907		-0.9065	-1.3038
	-1.24	*-1.11*		*-0.84*	*-1.21*
R^2	0.07	0.09	0.02	0.14	0.09

Note: Robust *t* statistics are shown in italics below the coefficients.

Table 5: Fixed-effects regressions on a small and homogeneously defined sample

	(1)	(2)
Dependent Variable:	Inequality	Inequality
Trade openness	-.0201	-.2807
	-0.69	*-2.79*
Financial development	.0421	.1299
	1.69	*1.56*
Govt.share of GDP	-.1082	-1.245
	-0.56	*-2.75*
Openness*Fin.dev.		-.0001
		-1.30
Openness*Govt.		.0212
		2.68

Note: Regressions are run on deviations from country means (approximate *t* statistics are shown in italics below the coefficients) and the sample includes only the first and last observation with household net income inequality information for each country, for a total of 34 observations. Partial correlations and predictions from these regressions are plotted in Figures 1-3.

Figure 1: Fixed-effects regressions on a small and homogeneously defined sample: partial correlations without interactions

coef = -.04468222, se = .02629601, t = -1.7

coef = -.1485138, se = .16349835, t = -.91

coef = .07924333, se = .02789517, t = 2.84
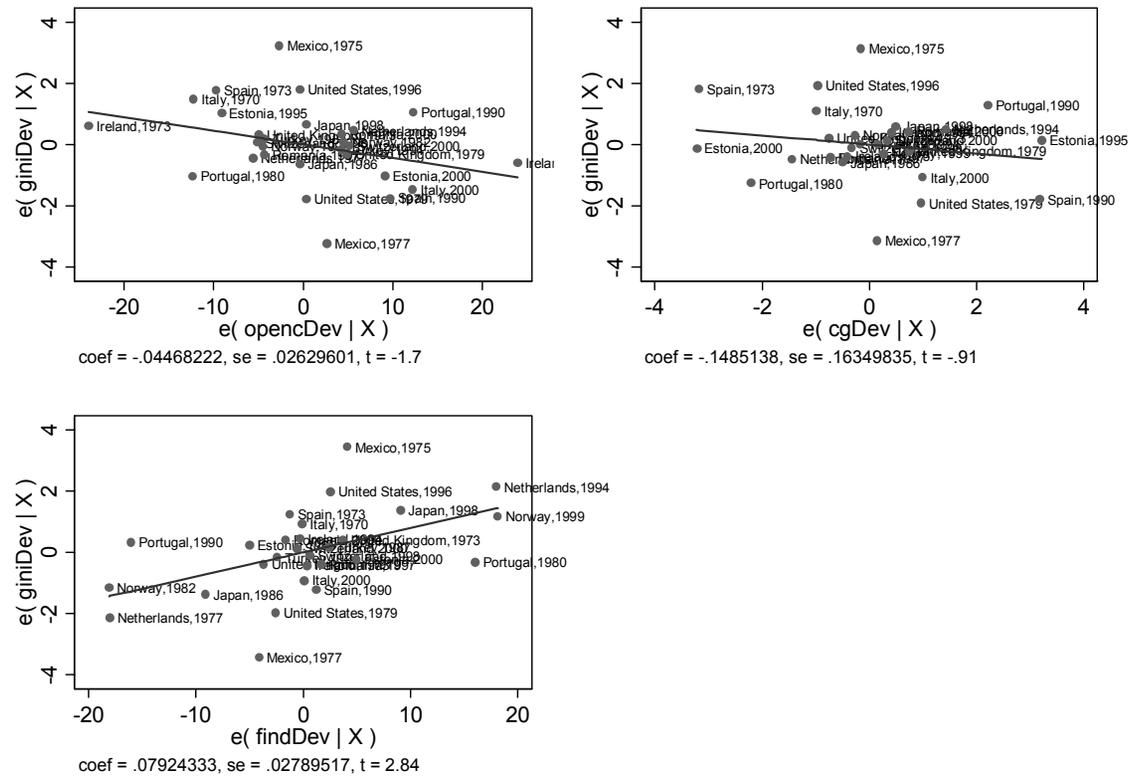
Figure 2: Fixed-effects regressions on a small and homogeneously defined sample: partial correlations with interactions

coef = -.24401127, se = .07622977, t = -3.2

coef = -1.1678952, se = .32985873, t = -3.54

coef = .18839974, se = .06572169, t = 2.87

coef = -.00146041, se = .00081137, t = -1.8

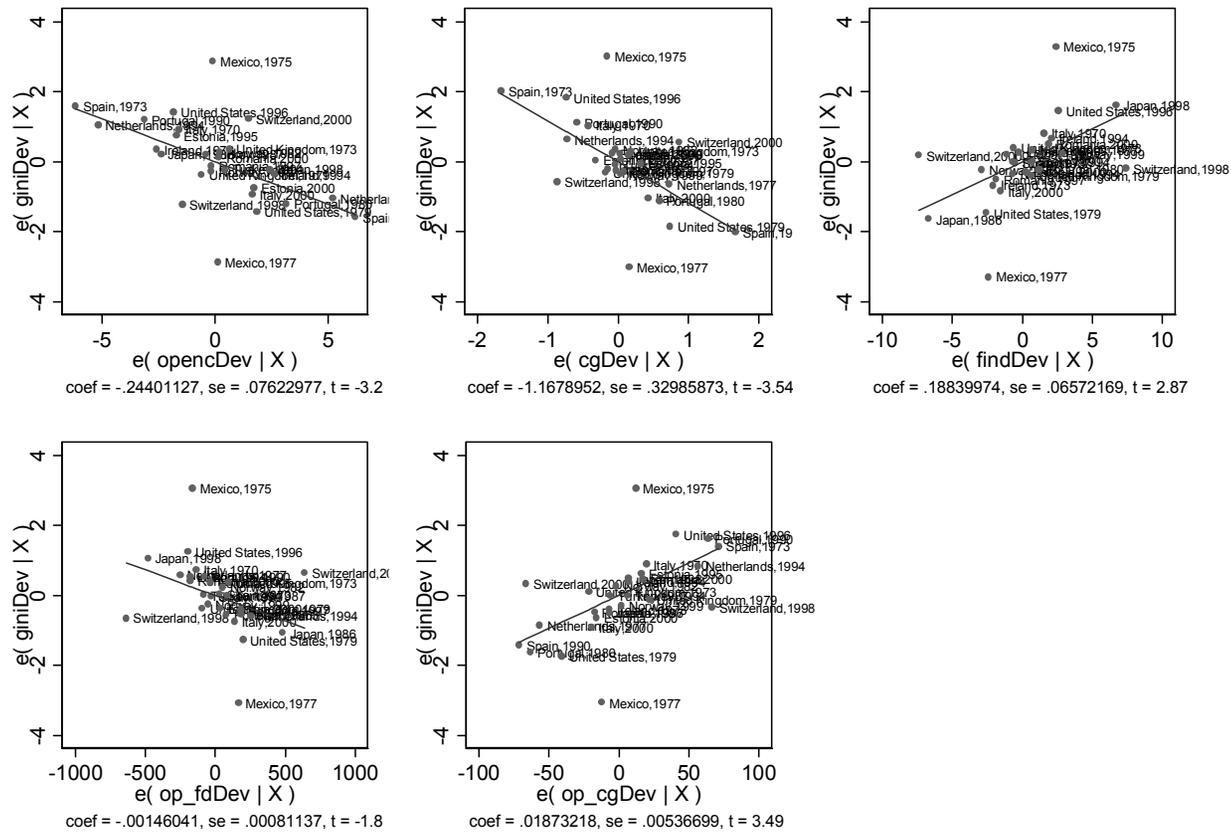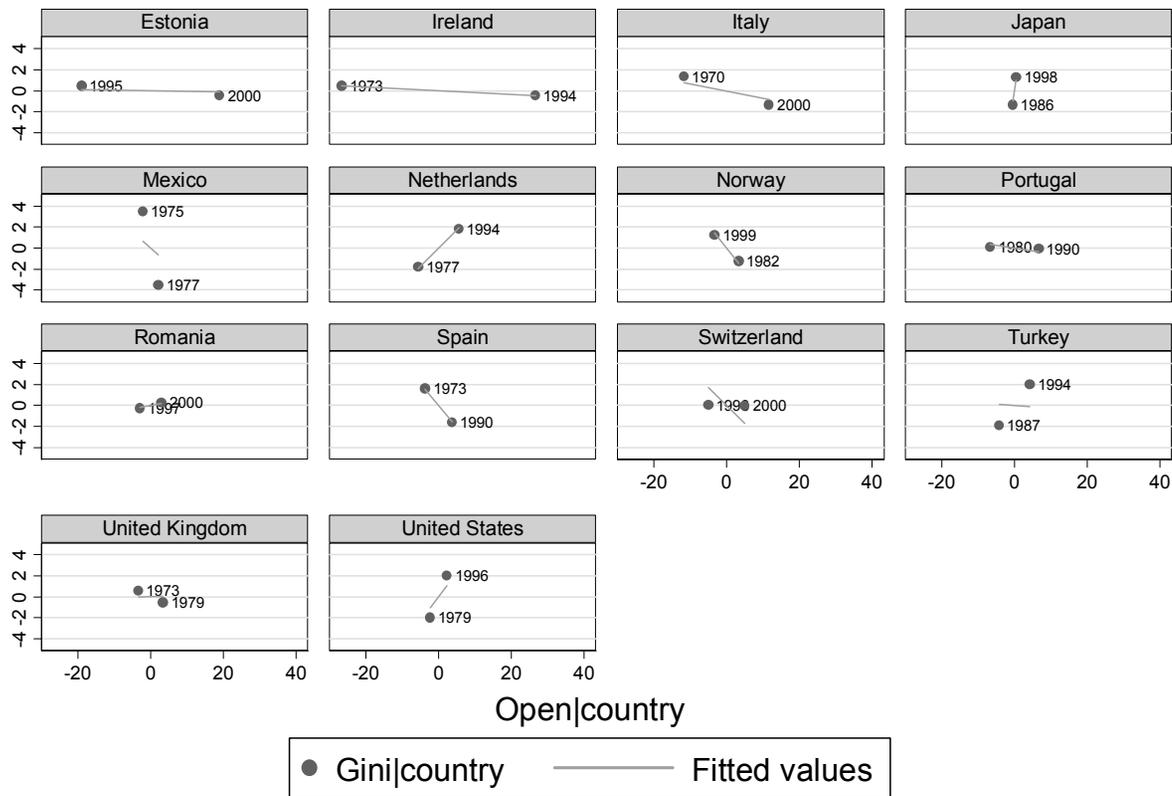coef = .01873218, se = .00536699, t = 3.49

Figure 3: Fixed-effects regressions on a small and homogeneously defined sample: country-specific interacted predictions of openness impact on inequality

Graphs by Country

Appendix: available observations

1. Armenia 1996
2. Armenia 1998
3. Austria 1983
4. Austria 1995
5. Austria 1996
6. Austria 1997
7. Austria 2000
8. Belgium 1979
9. Belgium 1985
10. Belgium 1988
11. Belgium 1992
12. Belgium 1995
13. Belgium 1996
14. Belgium 1997
15. Belgium 2000
16. Bolivia 1999
17. Bolivia 2000
18. Botswana 1986
19. Botswana 1994
20. Brazil 1992
21. Brazil 1995
22. Brazil 1996
23. Brazil 1997
24. Brazil 1998
25. Bulgaria 1992
26. Bulgaria 1993
27. Bulgaria 1994
28. Bulgaria 1995
29. Bulgaria 1996
30. Bulgaria 1997
31. Bulgaria 1998
32. Bulgaria 1999
33. Bulgaria 2000
34. Canada 1980
35. Canada 1981
36. Canada 1982
37. Canada 1983
38. Canada 1984
39. Canada 1985
40. Canada 1986
41. Canada 1987
42. Canada 1988
43. Canada 1989
44. Canada 1990
45. Canada 1991
46. Canada 1992
47. Canada 1993
48. Canada 1994
49. Canada 1995
50. Canada 1996
51. Canada 1997
52. Canada 1998
53. Canada 1999
54. Canada 2000
55. Chile 1987
56. Chile 1989
57. Chile 1990
58. Chile 1992
59. Chile 1993
60. Chile 1994
61. Chile 1995
62. Chile 1996
63. Chile 1998
64. Chile 1999
65. Chile 2000
66. Colombia 1991
67. Colombia 1993
68. Colombia 1995
69. Colombia 1996
70. Colombia 1997
71. Colombia 1998
72. Colombia 1999
73. Colombia 2000
74. Denmark 1976
75. Denmark 1987
76. Denmark 1992
77. Denmark 1995
78. Denmark 1997
79. Denmark 1999
80. Ecuador 1994
81. Ecuador 1995
82. Ecuador 1998
83. Ecuador 1999
84. El Salvador 1997
85. El Salvador 1998
86. El Salvador 1999
87. El Salvador 2000
88. Estonia 1993
89. Estonia 1994
90. Estonia 1995
91. Estonia 1996
92. Estonia 1997
93. Estonia 1998
94. Estonia 1999
95. Estonia 2000
96. Finland 1971
97. Finland 1976
98. Finland 1977
99. Finland 1981
100. Finland 1985
101. Finland 1987
102. Finland 1988
103. Finland 1989
104. Finland 1990
105. Finland 1991
106. Finland 1992
107. Finland 1993
108. Finland 1994
109. Finland 1995
110. Finland 1996
111. Finland 1997
112. Finland 1998
113. Finland 1999
114. Finland 2000
115. France 1970
116. France 1975
117. France 1995
118. France 1996
119. France 1997
120. France 2000
121. Germany 1994
122. Germany 1995
123. Germany 1996
124. Germany 1997
125. Germany 1998
126. Germany 1999
127. Germany 2000
128. Greece 1995
129. Greece 1996
130. Greece 1997
131. Greece 1998
132. Greece 1999
133. Greece 2000
134. Guatemala 1998
135. Guatemala 2000
136. Hungary 1987
137. Hungary 1989
138. Hungary 1991
139. Hungary 1993
140. Hungary 1994
141. Hungary 1995
142. Hungary 1996
143. Hungary 1997
144. Hungary 1998
145. Hungary 1999
146. Hungary 2000
147. Indonesia 1984
148. Indonesia 1990
149. Indonesia 1993
150. Indonesia 1996
151. Ireland 1973
152. Ireland 1980
153. Ireland 1987
154. Ireland 1994
155. Ireland 1995
156. Ireland 1996
157. Ireland 1997
158. Ireland 1998
159. Ireland 1999
160. Ireland 2000
161. Israel 1979
162. Israel 1986
163. Israel 1992
164. Israel 1997
165. Italy 1970
166. Italy 1971
167. Italy 1972
168. Italy 1973
169. Italy 1974
170. Italy 1975
171. Italy 1976
172. Italy 1977
173. Italy 1978
174. Italy 1979
175. Italy 1980
176. Italy 1981
177. Italy 1982
178. Italy 1986
179. Italy 1987
180. Italy 1989
181. Italy 1991
182. Italy 1993
183. Italy 1995
184. Italy 1996
185. Italy 1997
186. Italy 1998
187. Italy 1999
188. Italy 2000
189. Jamaica 1988
190. Jamaica 1990
191. Jamaica 1992
192. Jamaica 1993
193. Jamaica 1995
194. Jamaica 1996
195. Jamaica 1997
196. Jamaica 1998
197. Jamaica 1999
198. Japan 1970
199. Japan 1971
200. Japan 1972
201. Japan 1973
202. Japan 1974
203. Japan 1975
204. Japan 1976
205. Japan 1977
206. Japan 1978
207. Japan 1979
208. Japan 1980
209. Japan 1981
210. Japan 1982
211. Japan 1983
212. Japan 1984
213. Japan 1985
214. Japan 1986
215. Japan 1989
216. Japan 1992
217. Japan 1995
218. Japan 1997
219. Japan 1998
220. Latvia 1995
221. Latvia 1996
222. Latvia 1997
223. Latvia 1998
224. Latvia 1999
225. Latvia 2000
226. Lithuania 1994
227. Lithuania 1995
228. Lithuania 1996
229. Lithuania 1997
230. Lithuania 1998
231. Lithuania 1999
232. Lithuania 2000
233. Malaysia 1979
234. Malaysia 1984
235. Malaysia 1987
236. Malaysia 1989
237. Malaysia 1992
238. Malaysia 1995
239. Malaysia 1997
240. Mexico 1975

241. Mexico 1977	**324.** Portugal 1996	**403.** Thailand 1998
242. Mexico 1984	**325.** Portugal 1997	**404.** Thailand 1999
243. Mexico 1989	**326.** Portugal 1998	**405.** Thailand 2000
244. Mexico 1992	**327.** Portugal 1999	**406.** Turkey 1987
245. Mexico 1994	**328.** Portugal 2000	**407.** Turkey 1994
246. Mexico 1996	**329.** Romania 1997	**408.** Uganda 1992
247. Mexico 1998	**330.** Romania 1998	**409.** Uganda 2000
248. Mexico 2000	**331.** Romania 1999	**410.** United Kingdom 1970
249. Moldova 1997	**332.** Romania 2000	**411.** United Kingdom 1971
250. Moldova 2000	**333.** lovak Republic 1996	**412.** United Kingdom 1972
251. Nepal 1977	**334.** lovak Republic 1997	**413.** United Kingdom 1973
252. Nepal 1996	**335.** lovak Republic 1998	**414.** United Kingdom 1974
253. Netherlands 1977	**336.** lovak Republic 1999	**415.** United Kingdom 1975
254. Netherlands 1981	**337.** lovak Republic 2000	**416.** United Kingdom 1976
255. Netherlands 1983	**338.** Slovenia 1992	**417.** United Kingdom 1977
256. Netherlands 1985	**339.** Slovenia 1993	**418.** United Kingdom 1978
257. Netherlands 1987	**340.** Slovenia 1994	**419.** United Kingdom 1979
258. Netherlands 1988	**341.** Slovenia 1995	**420.** United Kingdom 1980
259. Netherlands 1989	**342.** Slovenia 1996	**421.** United Kingdom 1981
260. Netherlands 1990	**343.** Slovenia 1997	**422.** United Kingdom 1982
261. Netherlands 1991	**344.** Slovenia 1998	**423.** United Kingdom 1983
262. Netherlands 1992	**345.** Slovenia 1999	**424.** United Kingdom 1984
263. Netherlands 1993	**346.** Slovenia 2000	**425.** United Kingdom 1985
264. Netherlands 1994	**347.** South Africa 1990	**426.** United Kingdom 1986
265. Netherlands 1995	**348.** South Africa 1995	**427.** United Kingdom 1987
266. Netherlands 1996	**349.** Spain 1973	**428.** United Kingdom 1988
267. Netherlands 1997	**350.** Spain 1980	**429.** United Kingdom 1989
268. Netherlands 2000	**351.** Spain 1990	**430.** United Kingdom 1990
269. Nigeria 1975	**352.** Spain 1995	**431.** United Kingdom 1991
270. Nigeria 1980	**353.** Spain 1996	**432.** United Kingdom 1992
271. Norway 1970	**354.** Spain 1997	**433.** United Kingdom 1993
272. Norway 1973	**355.** Spain 1998	**434.** United Kingdom 1994
273. Norway 1976	**356.** Spain 1999	**435.** United Kingdom 1995
274. Norway 1979	**357.** Spain 2000	**436.** United Kingdom 1996
275. Norway 1982	**358.** Sri Lanka 1973	**437.** United Kingdom 1997
276. Norway 1984	**359.** Sri Lanka 1979	**438.** United Kingdom 1998
277. Norway 1985	**360.** Sri Lanka 1980	**439.** United Kingdom 1999
278. Norway 1986	**361.** Sri Lanka 1982	**440.** United Kingdom 2000
279. Norway 1987	**362.** Sri Lanka 1986	**441.** United States 1979
280. Norway 1988	**363.** Sri Lanka 1991	**442.** United States 1980
281. Norway 1989	**364.** Sri Lanka 1996	**443.** United States 1981
282. Norway 1990	**365.** Sri Lanka 2000	**444.** United States 1982
283. Norway 1991	**366.** Sweden 1972	**445.** United States 1983
284. Norway 1992	**367.** Sweden 1975	**446.** United States 1984
285. Norway 1993	**368.** Sweden 1976	**447.** United States 1985
286. Norway 1994	**369.** Sweden 1977	**448.** United States 1986
287. Norway 1996	**370.** Sweden 1978	**449.** United States 1987
288. Norway 1997	**371.** Sweden 1979	
289. Norway 1998	**372.** Sweden 1980	
290. Norway 1999	**373.** Sweden 1981	
291. Norway 2000	**374.** Sweden 1982	
292. Peru 1991	**375.** Sweden 1983	
293. Peru 1994	**376.** Sweden 1984	
294. Peru 1997	**377.** Sweden 1985	
295. Peru 2000	**378.** Sweden 1986	
296. Philippines 1971	**379.** Sweden 1987	
297. Philippines 1975	**380.** Sweden 1988	
298. Philippines 1985	**381.** Sweden 1989	
299. Philippines 1988	**382.** Sweden 1990	
300. Philippines 1991	**383.** Sweden 1991	
301. Philippines 1994	**384.** Sweden 1992	
302. Philippines 1997	**385.** Sweden 1993	
303. Poland 1983	**386.** Sweden 1994	
304. Poland 1984	**387.** Sweden 1996	
305. Poland 1985	**388.** Sweden 1997	
306. Poland 1986	**389.** Sweden 1998	
307. Poland 1987	**390.** Sweden 1999	
308. Poland 1988	**391.** Sweden 2000	
309. Poland 1989	**392.** Switzerland 1998	
310. Poland 1991	**393.** Switzerland 2000	
311. Poland 1992	**394.** Thailand 1971	
312. Poland 1993	**395.** Thailand 1975	
313. Poland 1994	**396.** Thailand 1981	
314. Poland 1995	**397.** Thailand 1986	
315. Poland 1996	**398.** Thailand 1988	
316. Poland 1997	**399.** Thailand 1990	
317. Poland 1998	**400.** Thailand 1992	
318. Poland 1999	**401.** Thailand 1994	
319. Poland 2000	**402.** Thailand 1996	
320. Portugal 1973		
321. Portugal 1980		
322. Portugal 1990		
323. Portugal 1995		

450. United States 1988	**455.** United States 1993	**460.** United States 2000		
451. United States 1989	**456.** United States 1994	**461.** Uruguay	1981	
452. United States 1990	**457.** United States 1995	**462.** Uruguay	1989	
453. United States 1991	**458.** United States 1996	**463.** Uruguay	1992	
454. United States 1992	**459.** United States 1997	**464.** Uruguay	1995	
		465. Uruguay	1997	
		466. Uruguay	1998	
		467. Uruguay	2000	