

Social Spending and Inequality in Latin America and the Caribbean

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Abstract

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We examine the determinants of inequality in an unbalanced pooled time series analysis for 18 Latin American and Caribbean countries for the period 1970 to 1995. The dependent variable is the Gini index of income equality, and the data were drawn primarily from Deininger and Squire's World Bank data set supplemented by data from Londoño and Szekeley which meet Deininger and Squire's criteria for "high quality" data. The social spending data are from a new data set assembled by three of the co-authors. Two sets of control variables measuring various aspects of development and investment dependence form the baseline for the study. We find that health and education spending has a negative impact on inequality, which is consistent with the results for OECD countries, while social security and welfare spending (transfers, primarily pensions) has a strong *positive* impact on inequality, which is the opposite of the findings for OECD countries. We argue that this contrasting finding is due to the fact that, in Latin America and the Caribbean, transfers go almost exclusively to formal sector workers who are concentrated in the upper range of the income distribution.

Introduction

There is strong evidence that Latin America and the Caribbean form the region with the highest average level of inequality and particularly with the highest concentration of income at the very top. This inequality has deep historical structural roots, but more contemporary political factors have reinforced rather than mitigated it. Indeed, over the past three decades of the 20th century inequality increased in most of the countries in the region for which data are available (Morley 2001: 24).

Inequality in land holding is at the center of the deep historical structural roots of inequality, originating in the colonial order. It not only cemented stark income inequality in the rural sector but also greatly contributed to the massive rural - urban migrations in the 20th century and thus to the swelling of the reserve army of unemployed that depressed wages for urban unskilled workers (Morley 2001: 63-65). Inequality in access to education and infrastructure perpetuated and reinforced income inequality in both the rural and urban sectors. Inequality in assets and income translated into inequality in political influence and thus in political institutions and policies that perpetuated the vicious cycle of inequality.

In all countries, including Italy, Spain, and Prussia, where large landholders played an important role in the national economy and depended on a cheap labor force, they were determined and effective enemies of democracy (Moore, 1966; Rueschemeyer, Stephens and Stephens 1992). As long as they remained important economic and political actors, democracy had difficulty surviving. Restrictive labor legislation combined with the comparatively small size of the urban industrial sector hampered the formation of broad-based unions with sufficient independence to challenge existing institutions and acquire economic and political clout. Weakness of democracy combined with weakness of labor obstructed the formation of strong political parties of the left, capable of building the redistributive capacity of the state and shaping a model of political economy that would produce growth with equity. The neoliberal economic reforms of the past three decades had a further regressive impact. On the average, this impact was small, but in some countries, particularly Argentina and Chile, it was quite dramatic (Morley 2001: 152-3).

We know from studies of distribution and redistribution in advanced industrial societies that the welfare state can be a very powerful instrument of redistribution. All welfare states in advanced industrial societies redistribute income downward, but the magnitude of this effect depends both on the overall size of the welfare state and the structure of taxation and expenditures (Bradley et al. 2003). In contrast, we have no systematic explorations of the effect of the size and type of social expenditures on inequality in Latin America. Here we provide the first multiple regression analysis that includes a whole range of theoretically important determinants of inequality, including strength of a country's democratic tradition and different varieties of social spending.

Literature and Hypotheses

The most comprehensive studies of the determinants of inequality in Latin America are Morley's (2001) and the World Bank's (de Ferranti et al. 2004). Morley

combines multiple regression analyses with nine country case studies, and his variables include national income, inflation, education, economic reform indices, and land distribution, but neither strength of the democratic tradition nor social expenditures. De Ferranti et al. (2004) examine a wide range of factors, including economic, demographic, and political determinants one by one, but they do not perform multiple regression analyses. Their study is extremely rich conceptually and provides a wealth of evidence for the structure and incidence of various social programs in individual countries, which can serve as a source of hypotheses about generalizable relationships.

Studies of inequality in cross-regional mixed samples of developed and developing countries (Alderson and Nielsen 1999), and in developing country samples (Rudra forthcoming) have paid particular attention to world system or globalization variables, along with demography and economic development. Alderson and Nielsen (1999), based on Nielsen and Alderson (1995) also examine the impact of sectoral differences in development, the size of the agricultural labor force, and the spread of education, whereas Rudra (forthcoming) includes social expenditures and democracy. We add to Nielsen and Alderson's (1995) internal-developmental model of inequality some of the indicators of investment dependence that Alderson and Nielsen (1999) examined, as well as a measure of the strength of the democratic tradition and social expenditures in our multiple regression analyses of inequality in Latin America.

Economic Development: Theories linking economic development and inequality have been profoundly shaped by Kuznet's (1955) finding of an inverted U curve. In a comparative historical analysis of three advanced industrial societies, Germany, Britain, and the United States, he found that inequality increased with the onset of industrialization, then leveled off, and finally declined as these societies approached the advanced industrial stage.¹ Most of the Latin American and Caribbean countries are at low or medium levels of industrialization, and only a handful may have passed the peak of the curve. Thus, for the whole sample we would expect the relationship between economic development and inequality to be positive or at most neutral, assuming that the few advanced countries would counterbalance the positive effect of the others.

Much statistical research has been devoted to establishing and explaining the U-curve relationship between economic development and inequality (e.g. Bollen and Jackman 1985, Crenshaw 1992, Muller 1985, 1988, 1989, Nielsen 1994, Nielsen and Alderson 1995, Simpson 1990). Alderson and Nielsen (1999) emphasize the role of labor force shifts and sectoral dualism, along with the demographic transition and the spread of education. If the mediating mechanisms are all correctly specified, we would expect them to absorb the effect of economic development in our models.

Sectoral dualism refers to the coexistence of a low productivity traditional sector and a high productivity modern sector, the former being largely identified with the agricultural sector. The traditional assumption is that in the course of economic development, an increasing share of the labor force shifts from the low productivity

¹ We should note that several advanced industrial societies have experienced a reversal of the trend to declining inequality over the past few decades. Harrison and Bluestone (1988) called this "The Great U-Turn." Since none of the Latin American societies have achieved an advanced industrial stage, we will not include the explanatory factors of this second U-turn in our discussion.

agricultural sector to the high productivity modern sectors, causing initially an increase in income inequality, then a leveling off, and finally a decline, when the great majority of the labor force is in the high productivity modern sectors. Sectoral dualism then is a function of the average difference in income between sectors and is expected to have a positive effect on overall inequality in a society (Alderson and Nielsen 1999: 610).

In the Latin American context of the second half of the 20th century, though, the shift of the labor force out of agriculture did not necessarily imply a shift into high productivity modern sectors. Rather, many rural-urban migrants ended up in the low productivity urban informal sector. Thus, we cannot necessarily expect the hypothesized relationship between sectoral dualism and inequality to hold in our set of countries.

Alderson and Nielsen (1999: 610), based on Kuznets (1955) hypothesize that the shift of the labor force out of the agricultural sector is associated with increasing inequality, because the degree of inequality within the agricultural sector is assumed to be lower. Thus, size of the agricultural population would be negatively associated with inequality. However, the assumption of lower inequality within the agricultural sector for Latin America is certainly questionable, given the tradition of great inequality in landholding. Indeed, a comparison of Gini indices based on urban and rural surveys contained in the full Deininger and Squire data set (1996b) shows that inequality in the rural samples in Latin America is generally higher. Therefore, we would expect the opposite relationship to hold in our set of countries; the larger the proportion of the labor force in agriculture, the higher the degree of inequality.

Demography: Rapid population growth is associated with economic development in the early and medium stages via the discovery of mortality-reducing medical practices. In advanced stages, the birth rate declines also and slows population growth. Previous studies have shown a strong association between population growth and the size of the young population, and a positive impact of population growth on inequality (Bollen and Jackman 1985, Simpson 1990). Alderson and Nielsen (1999) explain this impact with the oversupply of young unskilled workers that further depresses lower incomes and increases wage differentials. Thus, we expect population growth and percentage of the population under 15 years of age to push up the level of inequality. Holding other demographic features constant, we also might expect large aged populations to be associated with higher levels of inequality, particularly given the underdevelopment of public pension systems in most Latin American and Caribbean countries.

Education: The spread of education in the population, or the improvement of human capital, is regarded as a positive factor not only for the promotion of economic development but also for the reduction of inequality. In Latin American and Caribbean countries, however, the spread of education over the past three decades has coincided with a trend towards increasing inequality. In most of Latin America and the Caribbean, primary education has been universalized since 1970 for the younger cohorts, but a large proportion of these cohorts drops out at that point. At the other end of the educational spectrum, university education has expanded rapidly as well, as have returns to university education. Thus, educational achievement is unequally distributed and contributes to income inequality. In the newly industrializing countries of Asia, in contrast, secondary education has been nearly universalized and thus educational achievement is more equally distributed than in Latin America, causing lower income inequality (Morley

2001: 51-60). Accordingly, we would expect expansion of secondary school enrollment to have a depressing effect on inequality in Latin America and the Caribbean.

Foreign Direct Investment: The debate about the effects of foreign direct investment on growth and inequality in Latin America has a long pedigree. Modernization theorists expected foreign direct investment to promote economic growth and decreasing inequality, whereas dependency theorists pointed to the distorting effects of foreign investment on dependent economies which included increased inequality (e.g. Klarén and Bossert 1986). Statistical studies have found that stock of foreign direct investment has a positive effect on inequality (Bornschieer and Chase-Dunn 1985, Evans and Timberlake 1980). Tsai (1995) found that this effect is region-specific and that foreign direct investment has no significant distributional effect for Latin American countries.

Firebaugh (1992) argued that studies of the effects of stock of foreign direct investment on economic growth were flawed because they typically included measures of both stock and flow, and a measure of the foreign investment rate (flow/stock) had a significant positive effect on economic growth. Thus, he argued, the authors of these studies wrongly interpreted the negative coefficient for stock as indicating a detrimental long-term effect of foreign investment, when it in fact was the result of a denominator effect and consistent with a positive effect of the foreign investment rate. The same critique, then, could be applied to studies of inequality that include both stock and flow measures.

Anderson and Nielsen (1999) test Firebaugh's arguments and find a positive and statistically significant effect of foreign investment stock, no significant effect of flow, and a significant and positive effect of investment rate on inequality. Thus, the positive effect of stock could not be the result of its role as the denominator of the rate. They also examine regional effects and find that stock of foreign direct investment continues to have a significant positive effect on inequality net of the region variables and interactions. Accordingly, we expect a positive effect of the stock of foreign direct investment on inequality.

We also expect a positive effect of flows of foreign direct investment on inequality in Latin America and the Caribbean, because foreign investment usually brings comparatively capital intensive production that creates comparatively few but well paying jobs. In addition, foreign investors have typically opposed corporate taxation and often been able to extract concessions at the point of negotiations about new investment. This in turn keeps tax revenue and thus the redistributive capacity of the state restricted.

Democracy: There are strong theoretical reasons to expect that length of a country's democratic experience is associated with lower inequality (Rueschemeyer, Stephens and Stephens 1992: 10). Democracy gives the powerless and underprivileged the chance to organize and use organization as a power base to gain entry into the political decision-making process. The most effective channels for underprivileged groups into the political decision-making process are political parties, as they lack the connections and funds to influence decision-makers directly. However, it takes time for parties to gain coherence and establish roots in social bases, as well as for legislatures to pass major pieces of legislation and for that legislation to be implemented. In particular,

it takes time for parties representing the interests of less privileged groups to consolidate. These groups and parties need to have the freedom to organize and establish linkages in order to gain representation in competition with parties representing privileged groups and enjoying a financial advantage.

In studies of income distribution in advanced industrial democracies, democracy does not figure as a variable because there are no non-democratic cases outside of Southern Europe in the post-WW II period. In Latin America and the Caribbean, in contrast, there is great variation in the length of time for which a country has been democratic. Thus, we expect the countries with the longer democratic traditions to have lower inequality. Other studies have found such an effect (Bollen and Jackman 1985, Burkhardt 1997, Rudra forthcoming), but they have measured the immediate presence of democracy in the year of the observation of the dependent variable or the year before, not the strength of the democratic tradition, which is theoretically more appropriate.

Social Spending: In advanced industrial democracies, size of the welfare state is strongly associated with reduction in inequality (Bradley et al. 2003). In Latin America and the Caribbean, the evidence for the distributive impact of social spending is more mixed and tends to be different for different kinds of expenditures. Social security spending, particularly the largest share that goes to pensions, tends to be regressive (de Ferranti et al. 2004). Social security schemes are typically tied to formal sector employment and benefits are tied to earnings, so the entire workforce in the informal sector is excluded, and within the formal sector benefits are unequally distributed. Thus, we expect a negative impact of social security and welfare spending on inequality.

Spending on health and education is spending on social services and thus its impact on inequality is expected to have a considerable lag. Moreover, its distributive effect depends on the allocation of health and education spending. Allocation to preventive and primary care in rural and urban clinics has a much more redistributive impact than allocation to expensive curative medicine in urban hospitals. As de Ferranti et al. argue, the distributive impact of an expansion of services depends on the initial level of coverage or enrollment (2004: 260-1). Where initial enrollment or coverage is relatively high, an expansion will predominantly benefit the lower income groups; where it is low, the middle and higher income groups are likely to be the first to benefit from an expansion. If one looks at levels of expenditures, though, as we do here, rather than changes, one can hypothesize that spending on primary education will be redistributive and spending on university education regressive, so the greater the share of education spending going to primary education, the more progressive the overall impact. The same argument holds for spending on preventive and primary care versus curative hospital care. We do not have breakdowns for these different allocations, but evidence from case studies indicates that the bulk of education spending is progressive and health spending slightly progressive or neutral. Thus, we hypothesize an overall depressing effect of levels of expenditures for health and education on inequality.

Measures of the Dependent and Independent Variables

We use the Gini coefficient to measure income inequality because it “combine(s) maximum coverage of countries and time periods with an acceptable level of quality” (Deininger and Squire 1996a: 567). One weakness of the Gini is that it is an aggregate measure, and as such, it masks the micro-level workings of how income distribution changes. For the purpose of this paper, however, we are interested in explaining aggregate variation in inequality, and thus this problem does not affect the relevance of our findings.

Our Gini observations are compiled from the datasets of Klaus Deininger and Lyn Squire (1996b) and Juan Luis Londoño and Miguel Székely (1997). Deininger and Squire (1996a) establish three criteria for “good quality” Gini data, namely that the observations be based on household surveys; that the data provide comprehensive coverage of the country; and that the observations fully cover all income sources (568). Londoño and Székely (1997) abide by the same stipulations for “good quality” data, and add 40 observations. We include only high quality observations in our dataset with two exceptions. Nationally-representative Gini estimates are unavailable for both Argentina and Uruguay because household surveys are only conducted in urban areas. Gini estimates for both countries do, however, fulfill Deininger and Squire’s two additional criteria. In light of this fact, and because of the high levels of urbanization in both Argentina and Uruguay,² we follow Székely and Hilgert (1999) and include urban-based Gini observations for both countries in our sample. The estimates are taken from Deininger and Squire’s (1996b) full dataset. To control for biases that might be generated by the nature of Argentina and Uruguay’s Gini coefficients, we include a dummy variable coded 1 for all values generated from urban samples and 0 for all other cases.

Deininger and Squire (1996a) and Londoño and Székely (1997) find that other technical aspects of household survey data often influence the value of Gini estimates. There are three aspects of data collection that may result in cross-national variation in Gini measures: whether data are recorded for the household or the individual, whether values are calculated based on income or consumption, and whether gross or net income sources are considered. We control for two of these potential problems by including a dummy for Gini values that are calculated for the household (1) rather than per capita (0), and for coefficients that are based on income (1) instead of consumption (0). We chose not to control for variation in the income source (gross versus net), because previous studies (e.g. Alderson and Nielson 1999) found this variable to be insignificant.

We include a dummy variable to control for period effects in the 1990s. The variable carries a score of 1 for 1991 through 1999 and 0 for all other years. We also include a dummy variable for the debt crisis, which is coded 1 for the years 1983 through 1990 and 0 for all other years.

Our measures of social spending as a percentage of GDP are derived from two IMF volumes. Social spending is reported in the Government Finance Statistics Yearbook (GFS), where the IMF disaggregates central government spending into combined spending on social

² The mean value of the urban population as a percent of the total population in Argentina and Uruguay between 1945 and 2000 was 82.3 and 85.7 respectively (World Bank 2003: CD).

security and welfare and into combined spending on health and education.³ GDP is reported in the International Financial Statistics Yearbook. Both spending and GDP are reported in current local currency units.

The social spending figures we use include only outlays by the central government. Several authors fault this specification because it excludes state and local spending (Rodriguez 2004, Kaufman and Segura 2001). Several countries administer social programs at sub-national levels, with trends towards decentralization beginning as early as the 1980's. When available, GFS reports these sub-national spending figures only if the sub-national unit "has the power to raise a substantial portion of its revenue from sources it controls and its officers are independent of external administrative control in the actual operation of the unit's activities" (IMF, 1986, p 14). In our sample, GFS reports state and local spending only for Argentina and Bolivia. The extent of state and local spending across our sample, however, is most likely understated because, according to the GFS manual, such spending figures may simply be unavailable in some countries. On the other hand, and in defense of our approach, the majority of the country-years in our data set administer their social programs only at the national level; consequently, the overwhelming majority of our spending figures include all government spending. Furthermore, we are interested in the question of how social spending priorities influence income inequality at the *national* level. If we were to include state-level spending, however, we would capture sub-national influences. Such a model would be poorly specified for testing our theory of why countries vary cross-nationally with regard to income inequality.

We have included variables that capture various aspects of economic development to control for changes in inequality that are related to industrialization. To measure the level of development, we include employment in agriculture as a percent of total employment, GDP per capita in purchasing power parity dollars, and sector dualism in our models. Employment in agriculture as a percent of total employment is compiled from four sources (ILO 2003, ECLAC various years, World Bank 2003, and Alderson and Nielson 1999). Gross Domestic Product in 1995 purchasing power parity dollars is taken from the World Bank's (2003) World Development Indicators. Sector dualism measures the absolute difference between employment in agriculture as a percent of total employment and agriculture as a percent of GDP. The component parts of this measure are taken from four sources (ILO 2003, ECLAC various years, World Bank 2003, and Alderson and Nielson 1999). Where values were missing on either of the component parts, observations were extrapolated or interpolated.

To measure the spread of education, we take the net secondary school enrollment ratio, that is, the number of students of official school age who are enrolled in secondary schools as a proportion of all students from that age group. The official secondary school age is defined by each country's education system. The data are taken from the World Bank's (2003) World Development Indicators. Where values were missing, we extrapolated and interpolated observations.

³ Kaufman and Segura (2001) use the same measure and source as one of their specifications of social spending. Health spending includes those health expenditures which are provided as parts of social security and educational programs, such as health care provided as part of old age social security schemes.

To control for a country's penetration by direct foreign investment, we include measures of inward foreign direct investment flows and stock. Foreign direct investment inflows are measured as a percent of gross capital formation. The data are compiled from the World Bank's (2003) World Development Indicators. The World Bank (2003) defines inflows as "the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments" (CD rom). The measure of inward investment in stock is reported in millions of dollars and is taken from two sources (UNCTAD's (2002) Handbook of Statistics and from the United Nations Centre on Transnational Corporations (1985). The missing values for stock of inward investment were interpolated. Since values of inflows of direct foreign investment fluctuate from year to year, interpolation is not an appropriate way to handle missing data for this variable, so the missing values were coded to the country mean for the eight country years for which there were missing data.

Finally, our models include a control for political regime type. We derive our measure of democracy from Rueschemeyer, Huber Stephens, and Stephens' (1992) democracy coding. Where values were not available, we extended the coding following the guidelines provided by the authors: colonies = 0, authoritarian regimes = 1, bureaucratic authoritarian regimes = 2, restricted democracy = 3, and full democracy = 4. These categories were collapsed into non democracy = 0, restricted democracy = .5, and full democracy = 1. To measure democratic history we cumulate the yearly scores beginning in 1945.

Analytic Techniques

We use an unbalanced panel data set with 96 observations from 18 Latin American and Caribbean countries: Argentina, Bahamas, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Guatemala, Jamaica, Mexico, Nicaragua, Panama, Peru, Uruguay, and Venezuela. The social spending data were available for varying time periods for the countries. The data span the period 1970 to 1995. A central problem in estimating regression models from panel data is that the assumption of independence of errors across observations is unlikely to be satisfied. As a result OLS produces incorrect standard errors for the regression coefficients (Greene 1993). There are several strategies to deal with correlated errors in panel data. One approach assumes serially correlated errors within each unit (country) obeying a unit specific autoregressive process (which may optionally be constrained to be the same across units). This approach requires what Stimson (1985) calls temporally dominated time-series of cross-sections, i.e., data structures consisting of relatively few units observed over many equally spaced time points (Beck and Katz 1995:635-4; Beck 2001). Since the average number of time points (5) is much smaller than the number of units (18), our data set precludes this approach.

Another approach is to estimate a random effect model (REM) in which the error term contains a unit-specific component that differs across units but is constant over time for a given unit. Such an error structure would arise if unmeasured unit-specific causes, such as systematic measurement differences or other overlooked aspects of the social and cultural makeup of a country, affect the dependent variable in the same way at each point in time over the period of the data. The stable unit specific component implies that observations for the same

unit at different time points are all correlated by the same amount, ρ . The REM strategy is feasible with our data; one attractive feature of REM is that it allows estimating the value of ρ . However, REM requires relatively strong assumptions, such as equal correlations among errors within units.

Because it is not substantively essential in this study to measure ρ , we adopt an alternative estimation strategy that addresses the correlation problem while requiring a minimum of assumptions on the behavior of the errors. We combine OLS estimation of the regression coefficients, which provides consistent estimates of the regression coefficients, with the use of a *robust-cluster* estimator of the standard errors. The standard (i.e., non-cluster) Huber-White or "sandwich" robust estimator of the variance matrix of parameter estimates was discovered independently by P. Huber (1967), White (1980) and others (see Long and Ervin 2000 for a detailed description). It provides correct standard errors in the presence of any pattern of heteroskedasticity (i.e., unequal variances of the error terms) but not in the presence of correlated errors (i.e., nonzero off-diagonal elements in the covariance matrix of the errors). The robust-cluster variance estimator is a variant of the Huber-White robust estimator that remains valid (i.e., provides correct coverage) in the presence of *any* pattern of correlations among errors *within* units, including serial correlation and correlation due to unit-specific components (Rogers 1993; see also Sribney 1998; StataCorp 1999: 256-260). Thus the robust-cluster standard errors are unaffected by the presence of unmeasured stable country-specific factors causing correlation among errors of observations for the same country, or for that matter any other form of within-unit error correlation.⁴

The robust-cluster estimator of the standard errors is only impervious to correlations of errors *within* clusters. It requires errors to be uncorrelated *between* clusters. The latter assumption might be violated if unmeasured factors affect the dependent variable in all units at the same point in time. Global economic fluctuations, such as the debt crisis period in Latin America in the 1980s, could produce such contemporaneous effects. To evaluate the potential impact of such unmeasured period specific factors we re-estimated the models with indicator variables for the debt crisis (1982-90) and for the 1990s (1991-2000); the baseline category corresponds to 1970-82.

Population growth, the proportion of the population over 64, and the proportion of the population under 15 proved to be very highly intercorrelated. When two of these three variables were entered together with the other independent variables, the independent variables were multi-collinear even without the period dummies. When entered alone, youth population and population growth carried the wrong sign. The aged population was correctly signed but insignificant. Moreover, when the period dummies were included, the independent variables were again multicollinear. Since the aged variable had the highest variance inflation factor value, it was dropped from the analysis.

Results

⁴ Long and Ervin (2000) find that the alternative robust estimator HC3 proposed by MacKinnon and White (1985) performs better than the standard Huber-White robust estimator in small samples in the presence of heteroskedasticity. However HC3 is not defined for clustered data and not impervious to correlated errors within clusters. Thus HC3 is not suitable for our data.

The results of our analyses are presented in Table 2. Model 1 is our full model with all theoretically relevant independent variables and the dummies to correct for the differences in the methodology employed in the surveys on which the inequality data are based. Model 2 adds the period dummies, both of which are significant. As a result, the period dummies are retained in model 3, the reduced equation which contains all of the independent variables significant at the .1 level.⁵ The overall fit is very good with an R^2 of .80. The dummy variables for the variance in methodologies are both quite large. In the case of the income vs. expenditure dummy, our results indicate that the income based studies result in a Gini index that is 6.7 higher than is the case of expenditure based studies. This squares very well with the results of Deininger and Squire's (1996a) analysis of a world wide data set and Londoño and Székely's (1997) analysis of Latin American and Caribbean data, both of which suggest that the income based Gini will be 6 units higher than the expenditure based Gini. The urban dummy in our analysis suggests that a Gini index based on an urban sample is 13 units higher than one based on a national sample. An examination of the data in Morley (2001) shows that for Latin American and Caribbean countries for which there are data for urban and national samples for the same country and years, the national ginis are 5-14 units higher than the urban sample ginis, placing our two urban samples, Argentina and Uruguay at the high end of this distribution. However, the countries in Morley's study that are at the high end of the distribution differ from Argentina and Uruguay in that they have lower than average urban populations, higher than average informal sectors, or both. Thus, it seems likely that a national sample from these two countries would not reveal such large increases in the Gini indices.

Substantively, model 3 shows that social security and welfare spending, health and education spending, democracy, agricultural employment, and inflows of direct foreign investment are significant and in the expected direction. The positive impact of social security and welfare spending on inequality is particularly large: a standard deviation increase in social security and welfare spending (3.41%) is associated with a 4.8 increase in the Gini index. A standard deviation increase of health and education spending (2.81%) results in a more modest decrease of 1.2 in the Gini. Nonetheless, it is almost as large as the decrease in the Gini caused by a standard deviation increase in the cumulative democracy index (1.8) and somewhat larger than the same figures for an increase in the Gini associated with employment in agriculture (1.1) and inflows of direct foreign investment (.8).

Sector dualism, secondary school enrollment, and stock of foreign direct investment are all correctly signed but only significant at the .1 level. In the case of sector dualism, we did anticipate that the size of the urban informal sector in Latin America would reduce the impact of the difference between the low productivity agricultural sector and the rest of the economy that Alderson and Nielsen (1995) found for their cross-regional sample. In the case of stock of foreign direct investment, the effect does become significant in model 5, when Argentina and Uruguay are deleted from the analysis. This suggests that the inegalitarian effect of accumulated direct foreign investment is stronger in less urbanized societies with larger informal sectors.

⁵ Three variables were dropped in two steps. Per capita GDP was dropped from model 2. In the resulting equation, secondary education and the household income dummy were not significant at the .1 level so they were dropped from the equation.

Our theoretical discussion suggested that a different relationship between social spending and inequality might exist in those countries with low informal sector employment. Six of the countries in the analysis; Argentina, Bahamas, Chile, Costa Rica, Uruguay, and Venezuela; fit this description.⁶ Model 4 presents the reduced equation for these six countries. In the full equation (not shown), social security and welfare spending was positive but insignificant so it was dropped in the reduced equation. The coefficient for health and education spending is significant, negative, and considerably larger than the coefficient in model 3. Thus, this equation indicates that in countries with low informal sector employment, increases in social security spending are not associated with increases in inequality and increases in health education spending reduce inequality to a greater degree than in the sample as a whole.

Though we have argued for the inclusion of the urban samples for Uruguay and Argentina, the reader might wonder if the inclusion of these data might bias our results. In model 5, we present the independent variables included in model 3 except the urban sample dummy and drop the data for these two countries. The results are very similar to those in model 3. The only significant difference is that inward stock of direct foreign investment is now significant. Thus, we conclude that the inclusion of the two countries did not bias our results.

Conclusion

In this article, we have show that the determinants of income inequality are very different in Latin American countries than they are in advanced capitalist democracies. Not only is social spending in advanced industrial democracies negatively related to inequality, it is the most important single determinant of inequality. By contrast, in Latin America and the Caribbean, social security and welfare spending is strongly and positively related to inequality, while health and education spending is modestly and negatively related inequality. The modest relationship of health and education spending is, nonetheless, of substantive political important because it is almost certain that we underestimated its effects because they are quite indirect. Unlike social security and welfare spending which are cash transfers, health and education spending are public goods provided free or subsidized to the population and would not appear as income or expenditure in the surveys on which the inequality is based. This direct effect, then, is missed entirely in our analysis. The indirect effect that appears in our analysis is the effect that health and education spending has on improving human capital in the bottom half of the income distribution, an effect which would appear only with a considerable lag.

Scholars familiar with the literature on welfare states in industrial democracies might find our results surprising, but, in fact, the strong positive impact of social security and welfare spending on inequality in Latin America and the Caribbean is easy to explain. These cash transfers are generally contribution-based and thus accrue

⁶ Based on the data on the informal sector in Portes (1995). None of the sources available presented data on informal sector employment in the English speaking Caribbean. We have placed the Bahamas in this group based on its very high levels of urban population and low levels of agricultural employment as well as on qualitative descriptions of the Bahamian economy (Maingot 1993).

only to formal sector workers who in these countries are in the upper part of the income distribution given the large size of the informal sector in most of these countries. In addition, pensions make up most of social security and welfare spending and Latin American pension systems tend to favor privileged employees, such as military officers, judges, and upper level civil servants. The importance of the size of the informal sector in shaping the impact of social security and welfare spending on inequality in Latin America and the Caribbean is underlined by the fact that we found no effect of such spending on inequality among countries with low levels of informal sector employment. However, we note that this absence of an effect still contrasts with the strong negative effect found in industrial democracies.

As expected, democratic history strongly shaped income distribution. This finding was robust across all of our equations and, on the average, the effect of democracy as indicated by the effect of a standard unit change in the independent variable was second only to social security and welfare spending. In the reduced model including all countries or all countries with inequality based on national survey data, inflows of direct foreign investment and employment in agriculture were associated with greater inequality. In the case of foreign investment inflows, the size of the informal sector is again a part of the explanation as these inflows would support the employment and thus income stream of formal sector workers. The fact that there was no relationship between foreign capital inflows and inequality among the countries with low formal sector employment supports this interpretation. In this group of countries, there was also no relationship between inequality and agricultural employment, indicating that they had reached a level of development at which this factor no longer mattered. Interestingly, in this group of countries, economic development as indicated by per capita GDP was strongly and negatively related to income inequality in contrast to the full sample among which no such relationship was found. We interpret this to indicate that these countries had passed the point in the Kuznets curve at which further development begins to decrease inequality.⁷

These results fit nicely with the analysis of determinants of social spending in Latin America and the Caribbean carried out by our research team (Huber, Mustillo, and Stephens 2004). In that analysis, we show that social security and welfare spending is significantly and positively related to right and center right parliamentary party strength while health and education spending is positively and significantly related to left and center left parliamentary party strength. Thus, parties of the left promote social spending that is egalitarian and parties of the right promote spending that is inegalitarian, which corresponds to the interests of the class constituencies of these parties.

⁷ Per capita GDP is 58% higher in the low informal sector countries than in the rest of countries.

References

- Beck, Nathaniel and Jonathan N. Katz. 1995. "What to do (and Not to Do) with Time-Series-Cross-Section Data in Comparative Politics." *American Political Science Review* 89 (3):634-647.
- Bollen, Kenneth A. and Robert W. Jackman. 1985. Political Democracy and the Size Distribution of Income." *American Sociological Review* 58: 283-301.
- Bornschier, Volker and Christopher Chase-Dunn. 1985. *Transnational Corporations and Underdevelopment*. New York: Praeger.
- Bradley, David, Evelyne Huber, Stephanie Moller, François Nielsen, and John Stephens. 2003. "Distribution and Redistribution in Post-industrial Democracies." *World Politics*. Vol. 55, No. 2 (January) 193-228.
- Burkhart, Ross E. 1997. "Comparative Democracy and Income Distribution: Shape and Direction of the Causal Arrow." *Journal of Politics* 59: 148-64.
- Crenshaw, Edward. 1992. "Cross-National Determinants of Income Inequality: A Replication and Extension Using Ecological-Evolutionary Theory." *Social Forces* 71: 339-63.
- Evans, Peter B. and Michael Timberlake. 1980. "Dependence, Inequality, and the Growth of the Tertiary: A Comparative Analysis of Less Developed Countries." *American Sociological Review* 45: 531-51.
- De Ferranti, David, Guillermo E. Perry, Francisco H.G. Ferreira, and Michael Walton. 2004. *Inequality in Latin America: Breaking with History?* Washington, D.C.: The World Bank.
- Deininger, Klaus and Lyn Squire. 1996a. "A New Data Set Measuring Income Inequality." *The World Bank Economic Review*. Vol 10, No. 3: 565-591.
- 1996b. "Income Inequality Dataset" Available at:
[<http://www.worldbank.org/research/growth/dddeisqu.htm>]
- Firebaugh, Glenn. 1992. "Growth Effects of Foreign and Domestic Investment." *American Journal of Sociology* 98: 105-30.
- Greene, William H. 1993. *Econometric Analysis*, 2d ed. Englewood Cliffs, NJ: Prentice Hall.
- Harrison, Bennett and Barry Bluestone. 1988. *The Great U-Turn: Corporate Restructuring and the Polarizing of America*. New York: Basic Books.
- Huber, Evelyne, Thomas Mustillo, and John Stephens. 2004. "Determinants of Social Spending in Latin America." Paper delivered at the Meetings of the Society for the Advancement of Socio-Economics, Washington, D.C., July 8-11.

- Huber, Peter J. 1967. "The Behavior of Maximum Likelihood Estimation under Nonstandard Conditions." Pp. 221-33 in *Proceedings of the Fifth Berkeley Symposium on Mathematical Statistics and Probability* 1, edited by L. M. LeCam and J. Neyman. Berkeley, CA: University of California Press.
- International Labor Organization. 2003. *Online Labor Statistics*. Available at: [<http://laborsta.ilo.org>].
- Kaufman, Robert R. and Alex Segura-Ubiergo. 2001. "Globalization, Domestic Politics, and Social Spending in Latin America." *World Politics*, 53, 4 (July): 553-88.
- Klarén, Peter F. and Thomas J. Bossert. 1986. *Promise of Development: Theories of Change in Latin America*. Boulder: Westview Press.
- Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *American Economic Review* 45:1-28.
- Long, J. Scott and Laurie H. Ervin. 2000. "Using Heteroskedasticity Consistent Standard Errors in the Linear Regression Model." *The American Statistician*. 54: 217-24.
- MacKinnon, James G. and Halbert White. 1985. "Some Heteroskedasticity Consistent Covariance Matrix Estimators with Improved Finite Sample Properties." *Journal of Econometrics*. 29: 53-7.
- Maingot, Anthony. 1993. "The Offshore Caribbean." Pp. 259-76 in Anthony Payne and Paul Sutton (eds.), *Modern Caribbean Politics*. Baltimore: Johns Hopkins University Press.
- Moore, Barrington. 1966. *The Social Origins of Dictatorship and Democracy*. Boston: Beacon Press.
- Morley, Samuel. 2001. *The Income Distribution Problem in Latin America and the Caribbean*. Santiago: United Nations Press.
- Muller, Edward N. 1985. "Income Inequality, Regime Repressiveness, and Political Violence." *American Sociological Review* 50: 47-61.
1988. "Democracy, Economic Development, and Inequality." *American Sociological Review* 53: 50-68.
1989. "Democracy and Inequality." *American Sociological Review* 54: 868-71.
- Nielsen, François. 1994. "Income Inequality and Industrial Development: Dualism Revisited." *American Sociological Review* 59:654-77.
- Nielsen, Francois and Arthur Alderson. 1995. "Income Inequality, Development and Dualism: Results From an Unbalanced Cross-National Panel." *American Sociological Review*. Vol 60, October: 674-701.

1999. "Income Inequality, Development, and Dependence: A Reconsideration." *American Sociological Review*. Vol. 64, August: 606-631.
- Portes, Alejandro. 1995. *En Torno a la Informalidad: Ensayos sobre teoría y medición de la economía no regulada*. México: FLACSO.
- Rogers, William H. 1993. "sg17: Regression Standard Errors in Clustered Samples." *Stata Technical Bulletin* 13:19-23. Reprinted in *Stata Technical Bulletin Reprints* 1993, 3:88-94.
- Székely, Miguel and Juan Luis Londoño. 1997. "Persistent Poverty and Excess Inequality: Latin America, 1970-1995." *Working Paper #357*, Inter-American Development Bank.
- Rudra, Nita. Forthcoming. "Openness, Welfare Spending, and Inequality in the Developing World." *International Studies Quarterly*
- Rueschemeyer, Dietrich, Evelyne Huber Stephens and John Stephens. 1992. *Capitalist Development and Democracy*. Chicago: University of Chicago Press.
- Simpson, Miles. 1990. "Political Rights and Income Inequality: A Cross National Test." *American Sociological Review* 55: 682-93.
- Székely, Miguel and Marianne Hilgert. 1999. "What's Behind the Inequality We Measure? An Investigation Using Latin American Data." *Working Paper No. 234*. Luxembourg Income Study.
- StataCorp. 1999. *Stata Statistical Software: Release 6.0*. College Station, TX: Stata Corporation.
- Sribney, William. 1998. "Comparison of Standard Errors for Robust, Cluster, and Standard Estimators." Retrieved January 21, 2003. Stata FAQ Statistics, Stata Corporation (<http://www.stata.com/support/faqs/stat/cluster.html>).
- Stimson, James A. 1985. "Regression in Time and Space: A Statistical Essay." *American Journal of Political Science* 29: 914-47.
- Tsai, Pan-Long. 1995. "Foreign Direct Investment and Income Inequality: Further Evidence." *World Development* 23: 469-83.
- United Nations Centre on Transnational Corporations. 1985. *Transnational Corporations in World Development*. Cambridge: Graham & Trotman.
- United Nations Commission on Trade and Development. 2002. *UNCTAD Handbook of Statistics*. CD Rom Version.
- United Nations Economic Commission on Latin American and the Caribbean (ECLAC). Various Years. *Statistical Yearbook on Latin America and the Caribbean*. Santiago: United Nations Press.

White, Halbert. 1980. "A Heteroskedastic-Consistent Covariance Matrix Estimator and a Direct Test of Heteroskedasticity." *Econometrica* 48:817-38.

World Bank. 2003. *The World Development Indicators*. CD Rom Version

Table 1. Variable Descriptions, Data Sources and Hypothesized Effects for the Analyses of Income Inequality

Variable (Variable Abbreviation)	Description	Hypothesized impact on Income Inequality
Dependent Variables		
Gini Coefficient	The Gini coefficient. Values are calculated from income distribution reported in quintiles. ^{a, b}	
Independent Variables		
<i>Methodological Controls</i>		
Urban Indicator	Coded 1 for Gini observations that are derived from urban samples and 0 for values that are calculated from national samples. ^a	-
Household Indicator	Coded 1 for Gini observations based on household income and 0 for values generated using individual (per capita) income. ^{a, c}	-
Income Indicator	Coded 1 for Gini observations that are calculated using income to measure inequality and 0 for consumption-based estimates. ^{a, c}	+
Period Indicator 1990s (nineties)	Period indicator coded 1 for 1991-95, 0 for all other years. ^d	- / +
Debt Crisis	Period indicator coded 1 for 1983-90, 0 for all other years. ^d	+
<i>Economic Development</i>		
GDP Per Capita	GDP per capita in 1995 purchasing power parity dollars, thousands of US dollars. ^e	+ or none; - for advanced countries
Sector Dualism	The absolute difference between the percent of the labor force in agriculture and agriculture as a percent of GDP. Missing values for the component parts of this measure were interpolated. ^{e, f, g, h}	+
Employment in Agriculture	Employment in agriculture as a percent of total employment. ^{e, f, g, h}	+
<i>Education</i>		
Net Secondary School Enrollment Ratio	The ratio of the number of children of official secondary school age who are enrolled in school, to the population of the corresponding age. Missing values were interpolated. ^e	-
<i>Foreign Direct Investment</i>		
Inflows	Net inflows of foreign direct investment as a percent of gross capital formation. Missing values are coded to the country mean. ^e	+
Inward Stock	Inward investment in stock as a percent of GDP. ^{i, j}	+
<i>Politics</i>		
Democracy	Regime type: non democracy = 0, restricted democracy = .5, and full democracy = 1, score cumulative from 1945 to date of observation. ^k	-
<i>Social Spending</i>		
Health and Education	Central Government spending on health and education as a percent of GDP. ^l	-
Social Security and Welfare	Central Government spending on social security and welfare as a percent of GDP. ^l	+

Sources: a.) Deininger and Squire (1996) b.) Londono and Szekely (1997); c.) Morley (2001); d.) coded by authors; e.) World Bank World Development Indicators CD (2003); f.) International Labor Organization's Online Labor Statistics (<http://laborsta.ilo.org>)

Table 2. OLS Estimates of Determinants of Income Inequality with Robust Cluster Standard Errors

Independent Variables	Model 1	Model 2	Model 3	Low Informal Sector Only Model 4	Without Urban Samples Model 5
<i>Methodological Controls</i>					
Urban Indicator	-14.837 *** (1.45)	-12.616 *** (1.67)	-13.122 *** (2.15)	-8.844 *** (.69)	
Household Indicator	-2.387 ** (.68)	-1.191 + (.87)		-3.144 ** (.69)	
Income Indicator	5.199 ** (1.64)	5.72 ** (1.65)	6.766 *** (1.3)		6.326 *** (1.38)
Nineties (1991-95) ^a		3.429 ** (1.05)	3.53 *** (.70)		3.531 *** (.78)
Debt Crisis (1983-90) ^a		2.653 ** (.88)	2.692 ** (.80)		2.723 ** (.88)
<i>Economic Development</i>					
GDP per capita (1995 ppp dollars)	0.191 (.24)	.261 (.27)		-1.436 *** (.11)	
Sector Dualism	.042 (.07)	.102 + (.07)	.123 + (.07)		.088 + (.06)
Employment in Agriculture	.097 * (.04)	.107 ** (.03)	.095 * (.04)		.123 ** (.04)
<i>Education</i>					
Net Secondary School Enrollment	-.009 (.03)	-.041 + (.03)		.197 ^ (.02)	
<i>Foreign Direct Investment</i>					
Inflows	.164 ** (.06)	.149 * (.06)	.142 * (.06)		.084 * (.05)
Inward Stock	.008 (.01)	.022 + (.01)	.016 + (.01)		.025 * (.01)
<i>Politics</i>					
Democracy	-.118 ** (.04)	-.149 *** (.04)	-.149 *** (.04)	-.147 *** (.02)	-.128 ** (.04)
<i>Social Spending</i>					
Health and Education	-.483 ** (.18)	-.295 + (.20)	-.355 * (.19)	-.554 ** (.15)	-.335 * (.17)
Social Security and Welfare	1.226 *** (.15)	1.187 *** (.14)	1.15 *** (.17)		1.397 *** (.12)
Constant	41.549 *** (2.73)	37.675 *** (3.22)	37.265 *** (2.37)	60.37 *** (1.15)	36.252 *** (2.24)
R ²	.79	.81	.80	.83	.81
N	104	104	104	56	90

*** p<.001, ** p<.01, * p<.05, + p<.1 ^ sign of coefficient opposite of directional hypothesis, One-tailed test except nineties, Standard errors in parentheses.

a Reference category is 1970-82