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Social Security and Long Run Economic Performance, and its Implications for Asian Tiger Economies ¹

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1. Introduction

For many years, conventional wisdom in development economics stated that unequal income distribution was a prerequisite for economic growth (Kuznets, 1955, Kaldor, 1978). Recently, however, both theoretical and empirical research into "Kuznets's Law" has begun to challenge the inverted U-shaped relationship between income inequality and income per capita (see e.g. Galor and Zeira (1993), Perotti (1993) and Banerjee and Newman (1991)). Clarke (1995) has even found robust empirical evidence of a negative relationship between income inequality and economic growth.

This is not to say that there is widespread agreement among economists on the impact of income transfers. Clarke (1995) states that from the negative relationship between income inequality and GDP per capita growth, observed by him, one may not conclude that "soak the rich" policies will improve long-term economic growth. On the contrary, high income inequality might well provoke high levels of government intervention, which in turn would lead to lower growth. Maybe countries with equitable income distribution have less need for such policies, which might explain the observed relationship. Bénabou (1996) has investigated systematically into the relationships between political regimes and economic growth, and showed, using a simple model, that with complete markets economic growth will be higher, the more biased against the poor is the political system.¹ Using data on semi-industrialised Latinamerican economies, Selowsky (1981) calculated that a 5 per cent transfer of GNP towards a "pure consumption" basic-needs package will result in a 0.5 per cent reduction in GNP growth.

The evidence on the relationship between income transfers and economic growth has come under attack in the past decade. Looking at the statistical evidence of OECD countries, Lindert (1996 : 21) concluded²:

"Big social-spending countries apparently save costs via their choice of government spending and by maintaining growth incentives as part of the social-transfer programs themselves."

Bénabou (1996), summarising growth regressions published in the economic literature of the 1990s, found that most transfer systems (including social insurance and pensions) show a positive sign, which is frequently statistically significant. His theoretical investigations lead him to explain these results as caused by asset market imperfections, to which we will return below. Particularly interesting in this respect is the simultaneous-equations approach by Perotti (1996) which provided a significant positive causal relationship running from redistribution through taxes on economic growth.

Recent research on the determinants of economic growth in the East Asian Newly Industrialising Countries (NICs) has challenged "Kuznets's Law" further. A comparison of data on income inequality and income growth per capita leads to the inevitable conclusion that in the last two decades, the East-Asian and South-East Asian economies have combined high income growth per capita with relatively low income inequality (World Bank, 1994). One may conceive a priori at least four possible routes which connect declining income inequality with rising economic growth :

¹ As will be seen later, his conclusions are different with imperfect asset markets.

- (i) by inducing increased savings and investments of the poor ;
- (ii) by contributing to political and macroeconomic stability³ ;
- (iii) by increasing x-efficiency of the low-income workers and
- (iv) by increasing market demand for domestic producers.

Our investigation will concentrate on the testing of Bénabou's (1996) alternative models of redistribution and economic growth, using Granger causality analysis. It is largely exploratory and will not go into the national differences of existing social security systems, nor in the role played by institutional and political factors⁴.

2. Testing alternative models

The causal relationship running from income transfer systems to economic growth performance seems to be a complex one. In his eluminating paper, Bénabou (1996) has investigated into two basic models of inequality, redistribution and economic growth.

One model assumes complete markets. It is found (see Bénabou (1996) proposition 1) that higher inequality will lead to more redistribution, which in turn will reduce economic growth through the conventional mechanisms of reduced capital accumulation and distortions. Put in a nutshell, Bénabou's complete markets model boils down to equations (1) and (2), and the reduced form (3) :

$$RED = a + b INEQ \quad (1)$$

$$GR = a' + b' RED \quad (2)$$

$$GR = (a' + ab') + bb' INEQ \quad (3)$$

with : RED = redistribution ;
 INEQ = inequality ;
 GR = growth ;
 b>0 and b'<0.

Equation (2) provides a testable relationship between redistribution and economic growth, with b' < 0 being a necessary condition for complete markets. As Bénabou (1996 : 31) stresses, this model of complete markets allows only redistribution that is detrimental to growth ; there is no place for policies that affect the people's ability to invest in physical or human capital (schooling, land reforms, etc.).

² Bénabou (1996: 29-30) has also suggested that progressive taxation, transfers, etc. can be combined with consumption taxes or investment subsidies in such a way as to maintain capital accumulation at the appropriate level.

³ It is interesting here to refer to Alesina & Rodrik (1994) whose model of endogenous growth combined with the median voter theorem, leads to the conclusion that destructive struggles that are harmful to growth are expected to be found in economies where resources (physical capital, land, human capital and unskilled labour) are distributed unevenly. In their view, the more equal the distribution of resources in the economy is, as initial conditions, the lower will be the equilibrium level of capital taxation and the higher economic growth.

⁴ Contrary to the impact of economic factors on Asia's economic performance, research on the more institutional and political factors, affecting economic growth in East-Asia or South-East Asia, is hardly available. Helliwell (1996) e.g., has investigated the effect of social trust and associational membership, as two key facets of "social capital", as well as differences in values, on long-term economic growth performance. For lack of data on Asia, he restricted the analysis to the industrial countries and found no evidence to support influences running from "social capital" to growth.

The Asian "tiger economies" might well conform the complete markets model. This conformity with the complete markets model, then, can be explained by historical or cultural factors that account for an absence of redistribution policies, such as widespread land reforms in the past, the role played by the "extended family", the predominant organisation of agricultural production and infrastructure maintenance on a community-level, etc. All these factors, by and large, could have contributed to a much smaller degree of income inequality and less political and social struggles over each group's "share of the cake".

If one assumes instead that asset markets, especially human capital markets, are imperfect, one obtains an alternative model of redistribution, inequality and growth. When credit markets are absent or imperfect, redistribution to the poor will relax their liquidity constraint, which will lead to more investment and higher economic growth. This model of growth and redistribution with imperfect asset markets can be summarised by the following equations (4) and (5), and the reduced form (6) :

$$INEQ = c + d RED \quad (4)$$

$$GR = c' + d' INEQ + e' RED \quad (5)$$

$$GR = (c' + cd') + (dd' + e') RED \quad (6)$$

with $d < 0$, $d' < 0$ and $e' < 0$

The mechanism whereby redistribution reduces inequality is that of the relaxation of the constraints due to the asset market imperfections.

In Bénabou's first model, the impact of redistribution on long-run economic growth performance is also the one advanced by Persson and Tabellini (1994) and Alesina and Rodrik (1994), who showed both theoretically and empirically, that as economic growth is largely determined by the accumulation of capital, including human capital, countries confronted with a distributional conflict will adopt tax policies and regulatory policies that do not protect property rights, and are harmful for capital accumulation and growth.

Alternative causation patterns abound, however. For instance, redistribution through social security provisions might well have dynamic positive effects on investment in human capital, and thus on long-run economic growth. The reasoning behind this proposition is that social security reduces the risks of investment in human capital. Starting from the empirical finding that wage differentials are smaller in developed than in developing countries, Ljungqvist (1995) e.g., proposes a formal demonstration suggesting that the lower wage differentials in the developed countries provide an implicit insurance on human capital (against failures in skill formation) and, therefore, stimulate investment in human capital. According to Ljungqvist (1995) the first-best world is where there is an insurance market for educational outcomes, and the situation in the developed world is closer to this ideal than the one in the developing countries. Viewed from this angle, social security might perform a similar function.

Another and broader route of causation from social welfare spending to economic growth is through the impact of the former on the acceptance of risks in the labour market. Pascha (1997) has argued that once incomes of people have reached a certain level, they will seek security, which will shy them

away from higher-risk occupations or from taking up entrepreneurial activities. Actually, Pascha (1997) suggests that South Korea has reached a stage where the lack of an appropriate social welfare system is working against entrepreneurial dynamism.

One should notice that equation (5) depicts the same influence of redistribution on economic growth as in equation (2), but in addition that lower inequality leads to higher growth. Depending on the values of d , d' and e' , the reduced form parameter $(dd' + e')$ of equation (6) can be either positive or negative. Evidently, $dd'+e'>0$ is a sufficient condition for the validity of the imperfect asset markets model. In case, however, regression analysis shows $dd'+e'<0$, there is no way to determine whether the estimated equation is equation (2) of the complete markets model, or the reduced form equation (6) of the imperfect asset markets model, and other additional tests, such as e.g. causality tests, have to be performed. If causality runs from inequality to redistribution, as equation (1) shows, the result of the causality test would vindicate the complete markets model. If, however, causality would run from redistribution to inequality - see equation (4) – the test would rather favour the imperfect markets model.

The recent literature on the Asian "tiger economies" also provides interesting arguments in favour of the imperfect markets model of redistribution and growth. Page (1994) for instance, has looked into the determinants of total factor productivity growth in the Asian Newly Industrialising Countries. He found that education, particularly basic education, through its impact on literacy and cognitive skills of the population enabled a further accumulation of human capital which in turn reduced income inequality, by reducing the scarcity rents of the well-educated that previously belonged to the richer strata of the population. In addition, Page (1994) found evidence that suggested a positive interaction between external trade orientation and educational attainment.

The interrelationships between economic growth and income inequality in the Asian NICs was also been investigated by Birdsall, Ross & Sabot (1995). In their view, education increases the supply of human capital, which *ceteris paribus* would lead to diminishing returns to investment in it. Contrary to typical developing economies, however, the Asian NICs have shown also marked increases in the demand for skills, to a large extent as a result of its industrialisation policies and external trade orientation. It follows that in the Asian NICs a virtuous circle developed from better education leading to higher labour productivity and the acquisition of higher technological skills, and finally to higher economic growth. This would induce higher demand for and supply of human capital. A second virtuous circle is activated : the declining relative scarcity of well-educated labour reduces the scarcity rents of this group, thus contributing to the decline in income inequality.

3. Some empirical findings concerning inequality and growth

Contrary to what one might expect from the foregoing simple Bénabou models, testing the relationships involved is far from an easy task.

There are problems related to data. The data concerning economic growth for our estimations are annual growth of per capita GDP, taken from the Summers and Heston Penn World Tables (Summers and Heston, 1991 and 1996). For inequality, the Deiniger and Squire (1996a, 1996b) data set was used, from which Gini coefficient measures of inequality were taken, first, these accepted in their high quality data set, next (in order to obtain a panel data set of a sufficient large size) these originating from income tax sources or at lower levels than nationally based surveys. Finally, our source for the redistribution data, was the bi-annual ILO inquiry on social security costs from which we used the data on social security, related to corresponding GDP (i.e. in GDP terms), see ILO (1967, 1981 and 1992). Led by the same concern of gathering a sufficient large data set and to the extent allowed by data availability, gaps or breakdowns in the social security time series were filled in and corrected by using IMF social security data from the annual governments financial statistics (and the financial statistics for data on GDP). Using these we computed periodical growth rates of social security expenditure shares in GDP which we applied to the ILO based data series. To mitigate the influence of erratic fluctuations and exceptional occurrences on the estimations, five-year averages were taken of all (available) data for the period 1960-1990. In this way, we could gather data for 45 countries of all continents, in which Africa was most underrepresented and of which one third were industrial countries, for 6 periods at most.

There might be some doubts concerning the extent to which social security costs are a good proxy for measuring redistribution in countries of different levels of economic and social development. The social security components that are financed by contributions from the potential beneficiaries, may have no redistribution impact between different income groups. In many developing countries, part of the available social security might redistribute income from the taxpayer, including the poor, to the people employed in the formal sector or in the government sector, and therefore increase inequality. Moreover in order to deal with redistribution in the Bénabou models, we should incorporate also public expenditure on primary and secondary education, housing, etc. Still, as mentioned above, social security often reduces the risks involved in incomplete labour and capital markets. As a first endeavour, we therefore will use the social security cost variable as being a reasonable substitute for redistribution as affecting inequality and economic growth.

There are also problems with the relationships involved. The following Figures 1 and 2 show a scatter diagram of the data on economic growth and income inequality, and on economic growth and social security costs respectively. On the basis of a visual inspection, not much can be concluded from these figures. At first sight, it would appear that a horizontal line drawn in Figure 1, corresponding to a Gini coefficient of about 40, might give a good fit, whereas the point in Figure 2 are much too scattered to indicate any relationship between social security and economic growth. Obviously, more intricate statistical methods, involving time lags, are needed, the more so as the real interrelationships are probably much more complex so that a direct testing of the complete and incomplete markets models is out of the question.

Figure 1 : Scatter diagram of economic growth and income inequality, 1960-1990

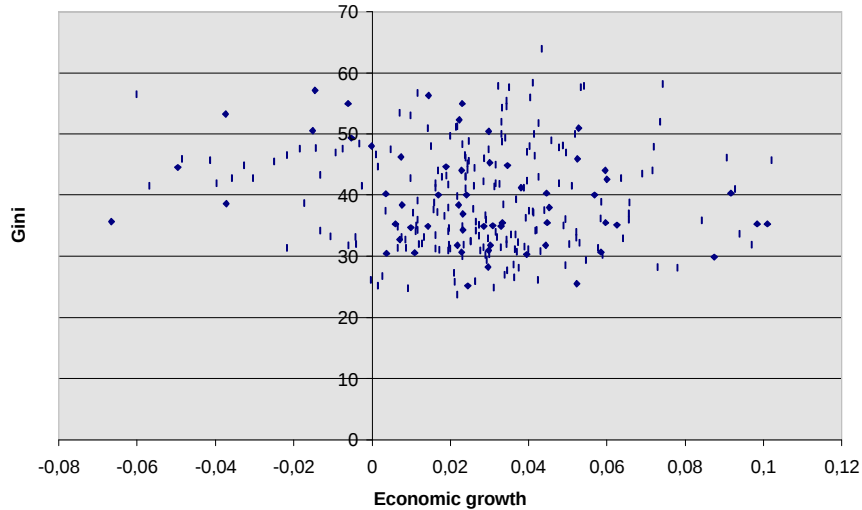
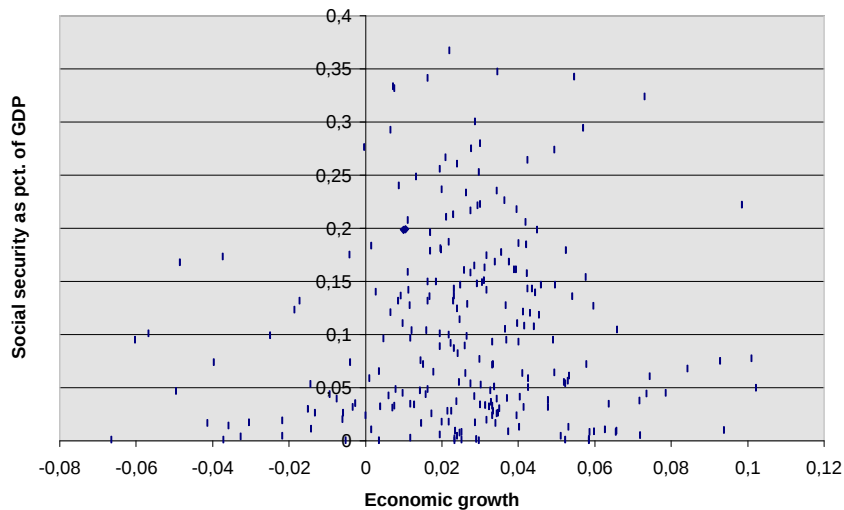


Figure 2 : Scatter diagram of economic growth and social security, 1960-1990



It will be clear that these models, despite their theoretical sophistication, cannot be considered as fully elaborated yet, and the number of *Protokolsätze* or theoretically crucial implications and experiments they allow are rather limited. However, the way causality is supposed to run between redistribution, inequality and growth, constitutes already one issue on which complete and incomplete market models of inequality and growth make a clear and distinctive prediction and therefore acquires model discriminating power. These predictions are summarised in the first and fourth proposition of Bénabou (1996 : 23 and 34) and presented in the equations (1)-(6) in this text.

Discriminating between the models in terms of the validity of the causal mechanisms between the variables they assume is possible by means of Granger causality tests. As we refrain from any a priori expectation concerning the relationships between the variables and, moreover, sufficient indications point to links in either way, these tests are performed in a vector auto-regressive (VAR) framework, where no a priori distinction between exogenous and endogenous variables is made. In general

terms, this model can be described for each country i , under the assumption of a common data generating process (DGP), as :

$$\begin{bmatrix} \pi_{11}(L) & \pi_{12}(L) & \pi_{13}(L) \\ \pi_{21}(L) & \pi_{22}(L) & \pi_{23}(L) \\ \pi_{31}(L) & \pi_{32}(L) & \pi_{33}(L) \end{bmatrix} \begin{bmatrix} GR_t \\ INEQ_t \\ RED_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \end{bmatrix} + \begin{bmatrix} e_{1i,t} \\ e_{2i,t} \\ e_{3i,t} \end{bmatrix} \quad (7)$$

where $\pi_{ij}(L)$ represents a k -th order polynomial in the lag operator, $[c_i]'$ a vector of constants and $[e_{iit}]' = [\mu_{ii}]' + [v_{it}]'$ with $[\mu_{ii}]'$ a vector of country specific fixed effects and $[v_{it}]'$ a serially independent random vector, satisfying all standard assumptions concerning its distribution.

The data in this specific application have mixed, cross section and time series characteristics, as they consist of observations of the three variables for a period of 25 years for 45 countries. A pooled dataset offers the advantage that variable omission bias can be corrected for by means of, e.g., fixed country effects which are supposed to capture the influence of omitted or forgotten variables. On the other hand, in the presence of lagged dependent variables, as is for instance the case when performing Granger causality tests, estimations in the usual fixed or random effects panel framework are inconsistent, as is well known (see, e.g., Hsiao (1986), Baltagi (1995) or Judson and Owen (1996)). Usually, this is corrected by first differentiating the variables, which results in the equations, for each country i and for $t=k+1, \dots, T$:

$$\begin{aligned} \Delta GR_{ti} &= \sum_{j=1}^k \beta_{11j} \Delta GR_{(t-j)i} + \sum_{j=1}^k \beta_{12j} \Delta INEQ_{(t-j)i} + \sum_{j=1}^k \beta_{13j} \Delta RED_{(t-j)i} + \Delta e_{1t} \\ \Delta INEQ_{ti} &= \sum_{j=1}^k \beta_{21j} \Delta GR_{(t-j)i} + \sum_{j=1}^k \beta_{22j} \Delta INEQ_{(t-j)i} + \sum_{j=1}^k \beta_{23j} \Delta RED_{(t-j)i} + \Delta e_{2t} \\ \Delta RED_{ti} &= \sum_{j=1}^k \beta_{31j} \Delta GR_{(t-j)i} + \sum_{j=1}^k \beta_{32j} \Delta INEQ_{(t-j)i} + \sum_{j=1}^k \beta_{33j} \Delta RED_{(t-j)i} + \Delta e_{3t} \end{aligned} \quad (8)$$

where Δ stands as usual for the first difference operator (e.g., $GR_t - GR_{(t-1)i}$). If the error component of the variables in level is assumed to be composed of a fixed individual effect, a fixed time effect and a white noise component (v_{it}) (the first of which is dropped by taking first differences), then a differential time effect $\Delta \lambda_t$ (i.e. not necessarily equal for each t) must be added to the specification.

Next, serial correlation between the error term and the first lagged first differentiated dependent variable is taken account of by using instrumental variables. Various options are available, from the lagged first differentiated dependent variable or its second lagged level (which may be assumed to be correlated with the first lagged first difference, but independent of the error term) as in Anderson and Hsiao (1981) to the more extended General Method of Moments (GMM) procedure, using supplementary orthogonality conditions, which results in a more efficient estimation. In this first application, we limit ourselves to the Anderson and Hsiao (1981) instrumental variable approach, using second lagged levels of the dependent variable as instrument for its first lagged first difference, which is reported to be superior to the second lagged first difference.

However, Granger causality tests are only strictly valid for stationary series and should therefore be preceded by a check of the order of integration of the variables, i.e. whether the data generating processes show a unit root or not. Concerning panel data, two approaches to unit root testing may be distinguished in the rather recent strand of econometric literature. A first one is based on the central tendency (usually the mean) of the unit root tests at the level of each individual observation unit, as in Levin and Lin (1994) and Im, Pesaran and Shin (1997). If slope homogeneity and a common data generating process is assumed (notwithstanding an observation unit specific deterministic trend), then one unit root test is performed for all observation units and might be considered as such as an alternative to the first approach. In the latter case, as shown in Breitung and Meyer (1994), mere OLS estimations of the common data generating process (DGP) are consistent under the null hypothesis of a unit root, provided some restricting assumptions concerning the individual error component may be imposed. Hence, the ordinary t-statistic in a regression of the first differences on the one period lagged levels (with or without lagged first differences and a common time effect) is suited to test if the coefficient of the latter is significantly different from 0. Under more general conditions with respect to the error component, Breitung (1997) proposes a GMM estimation for dynamic panel data to investigate the DGP. In particular, Hansen's test for the validity of overidentifying restrictions also be used as a unit root test statistic, which, even for 6 time periods, seems to perform rather well (in terms of test power) in Monte Carlo simulations (Breitung : 1997).

In verifying the stationarity of the GDP growth rate, the inequality and redistribution series, we followed the second approach, i.e. accepting the assumption of a common DGP for all individual observation units (countries) ⁵. The results of the tests both in the presence of restricted and unrestricted fixed individual effects are given in Table 1. With restricted individual error components, the tests were performed using a specification of the following form :

$$\Delta y_{it} = c + \gamma_0 y_{i(t-1)} + \sum_{j=1}^2 (\gamma_j \Delta y_{i(t-j)} + \lambda_j) + \varepsilon_{it} \quad (9)$$

for all variables (GR, INEQ and RED), i.e. an autoregressive form including one and two period lagged first differences and a fixed time effect. Observation unit specific fixed effects were ignored as they cancel out under the null hypothesis ($\gamma_0 = 0$). When considering the case of unrestricted individual error components, we followed the Arellano and Bond (1991) two-step instrumental variable estimation procedure (see also Baltagi, 1995). In this case, the Hansen test of the validity of the overidentifying restrictions, following a chi-square distribution with degrees of freedom equal to the number of instruments, under the null hypothesis, may be used as a test of the presence or rejection of a unit root.

The results for the restricted and unrestricted individual error components are broadly similar, even if the rejection of the unit root hypothesis is stronger in the second case. This is not very surprising, taken account of the already mentioned power properties of the Hansen misspecification statistic as unit root test and the obvious bias in the estimations in the restricted case when the null hypothesis is

⁵ The limited number of observations we disposed of (6 at most, due to the smoothing out by taking five year averages over the period 1960-1989), constituted the decisive argument for following the second approach, even

not true. Both cases point to a strong rejection of non-stationarity for GDP growth (GR), and for inequality (INEQ), though for the latter to a somewhat smaller extent. The results for redistribution (RED) are however more ambiguous. Non-stationarity can be rejected in the case of no limiting hypotheses concerning the individual error component, but only at the 10% significance level. Hence, whereas causality tests seem legitimate, certainly for GDP growth and inequality, one must remain more cautious when turning to redistribution. Results must be interpreted with more care because, in the presence of an autoregressive process with a unit root, the Anderson Hsiao instrumental variable estimator we used in the causality tests breaks down and is not asymptotically unbiased anymore.

Table 1: Results of the Unit Root Tests

Variable	Restricted Error Components t-value	General Error Components J-value
GR	-3,113***	24,181***
INEQ	-1,793*	19,871**
RED	-0,119	16,353*

Note. Own computations. *, **, ***, refer to significance at the 10, 5 and 1% level respectively. The “t-value” column refers to the value of the t-statistic of the hypothesis $\gamma_0 = 0$ in (9) ; the “J-value” column to the value of Hansen’s general specification test statistic. It is chi-squared distributed, under the null of unit root hypothesis, with ten degrees of freedom, i.e. $[(T-1)*(T-2)]/2$, with T the number of time periods in the sample, in our case T=6.

Turning next to the actual Granger causality tests⁶, estimations were performed for each relation separately, following a three and two lag specification (i.e. $k = 3$ or $k = 2$ for reasons of coping with possible autocorrelation of the error term). Granger causality was checked by means of Lagrange Multiplier and Lagrange Multiplier F-tests, as described in Charemza and Deadman (1992). Our main findings concerning the causality between growth, inequality and redistribution are summarised in Table 2.

Table 2: Results of the Granger Causality Tests

Dependent variable	GR	GR	INEQ	INEQ	RED	RED
Independent variable	INEQ***	RED*	GR	RED***	GR**	INEQ
Control variable	RED	INEQ	RED	GR	INEQ	GR
Lag specification	k=3	k=2	k=2,3	k=3	k=3	k=2,3

Note. Own computations. *, **, ***, refer to significance at the 10, 5 and 1% level respectively. Two lag specifications are mentioned when results were indifferent for it.

While interpreting these results, some attention has to be paid to the implications of the VAR framework in which the analysis was conducted. As lagged values of all variables are present in each equation, the relation between each two variables is always controlled by the third. Hence, the significance of the inequality variables for growth in the first equation implies that inequality Granger causes growth, when controlled for the influence of redistribution. As such, this seems in opposition to the

if Im, Pesaran and Shin (1997) provide critical values of their test statistic for five time periods. Unfortunately, we do not dispose of their tables at present.

⁶ Simms causality tests were not considered, because of the considerable loss of degrees of freedom in the presence of observations for only 6 time periods.

complete market model, where the influence of inequality on growth is supposed to run predominately if not exclusively by redistribution and where an independent effect of inequality is not conceived. Moreover, the causality test of inequality on redistribution and vice versa, each time controlled for growth, indicates that redistribution would indeed Granger cause inequality but would itself be exogenous for it. Finally, even if one has to remain careful in view of potential non-stationarity of the redistribution DGP, indications seem present that growth and redistribution would be simultaneous. The pattern all these findings sketch may be depicted in a scheme as in Figure 3.

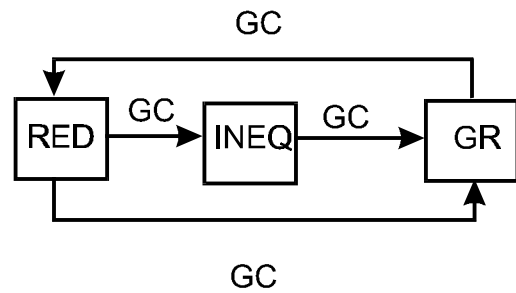


Figure 3: Granger causality patterns

At first sight the pattern suggested points in a direction corresponding to the relations (4)-(6), which made out the core of the imperfect asset market hypothesis. Empirical facts seem to bent more in favour of the incomplete but against the complete market model.

Yet, besides the doubts on the stationarity of redistribution (in which case estimations are inconsistent), some additional reasons oblige us to remain cautions. Most of the conclusive results we find are obtained with a three-lag specification of all variables. In that situation, we face a substantial reduction of the number of observations units and, actually, only the countries with the highest data quality remain, industrialised countries in the first place. The observation that we were unable to reproduce most of our findings for a two-lag specification, i.e. when a larger number of countries is included, especially developing countries, and, hence of the causal pattern mostly suggested by a three lag specification, might point to a possible sample selection bias and slope heterogeneity between developed and developing countries. It would imply that the fixed observation unit effects are insufficient to capture country specificity, which would have more complex features. It would also explain why we indeed found direct evidence of a causal relationship between redistribution and inequality, in contrast with Perotti, who in his comment on Bénabou's analysis (Perotti in Bénabou : 1996) points to the absence of clear and unambiguous effects of redistributive policies and the model complications in which this results⁷. It is definitely a topic for more thorough research.

4. Implications for the Asian “tiger economies”

From the foregoing it can tentatively be concluded that there is some reason to believe that Bénabou's imperfect markets model explains better than the complete markets model the statistical relationship of redistribution, inequality and growth. These results allow us to elaborate on some implications for the Asian “tiger economies”.

As mentioned above, World Bank (1994) stated that the Asian “tiger economies” show a remarkable growth record with on average relatively low levels of inequality. However, a closer look at the posi-

tion of the Asian Newly Industrialising Countries (NICs : Hong Kong, Taiwan, Korea, Singapore) and the other ASEAN countries in Figure 1, reveals that the latter category of "next tier NICs" combine lower growth records with higher inequality, but also that many other countries have Gini coefficients that are comparable with these of the Asian NICs, but with much lower growth performance. Moreover, the time pattern of the economic growth-income inequality observations differs widely between the "tiger economies", as is evidenced by Figure 4a-e, given for purely illustrative purposes.

Figure 4a : Economic growth and income inequality : Hong Kong, 1960-1990

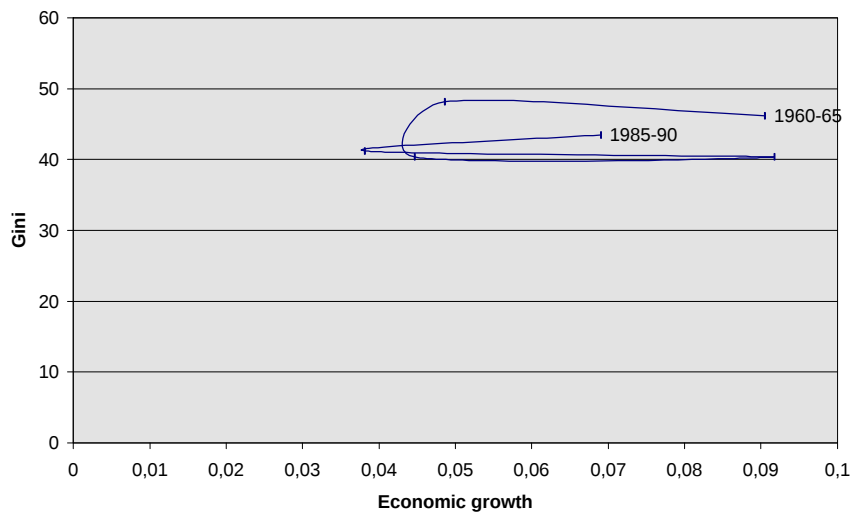
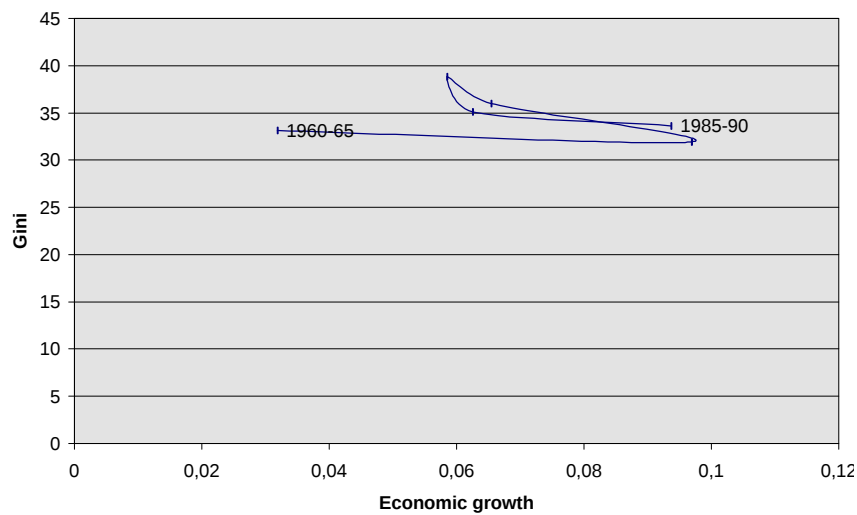


Figure 4b : Economic growth and income distribution : Korea, 1960-1990



⁷ However, one may not conclude from this to the general impossibility to model discrimination, as it is allowed to some extent by indirect indications on the relations between inequality and redistribution, i.e. by the evidence concerning the causation of economic growth.

Figure 4c : Economic growth and income inequality : Singapore, 1965-1990

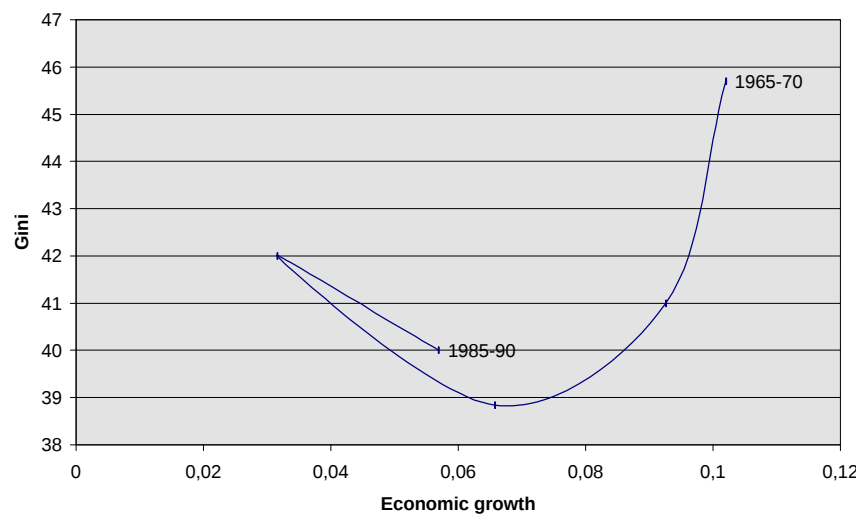


Figure 4d : Economic growth and income inequality : Malaysia, 1960-1990

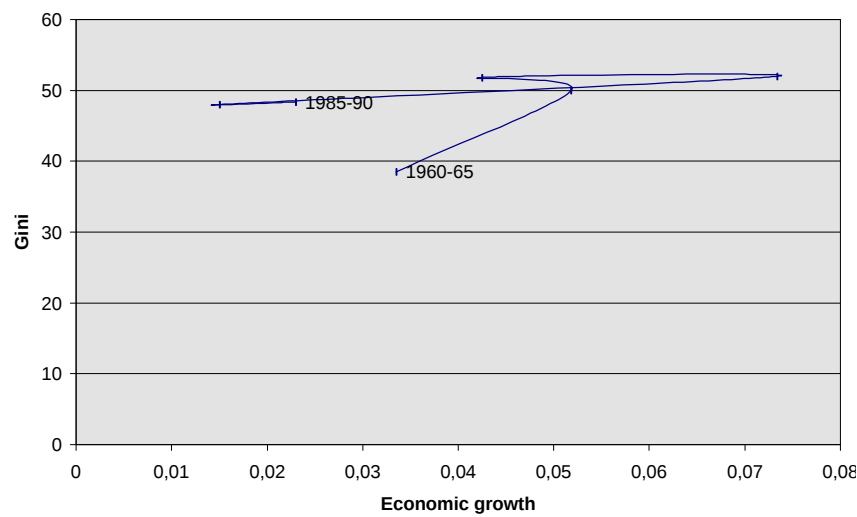
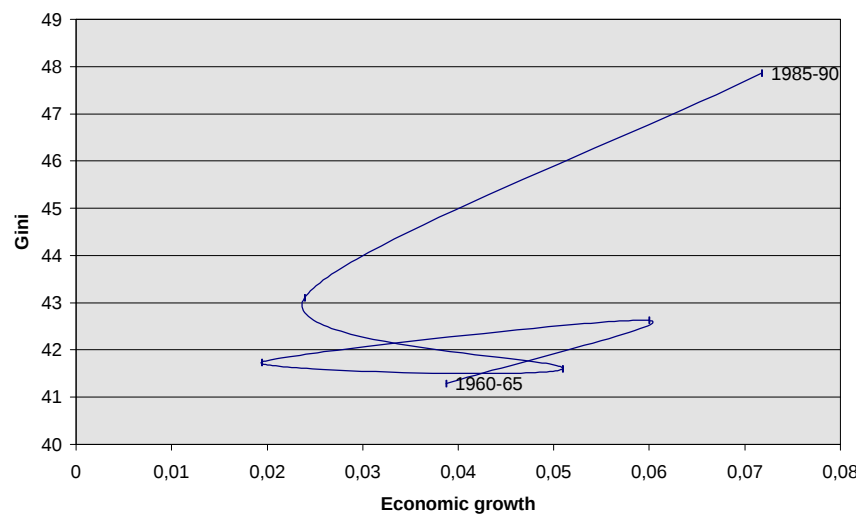


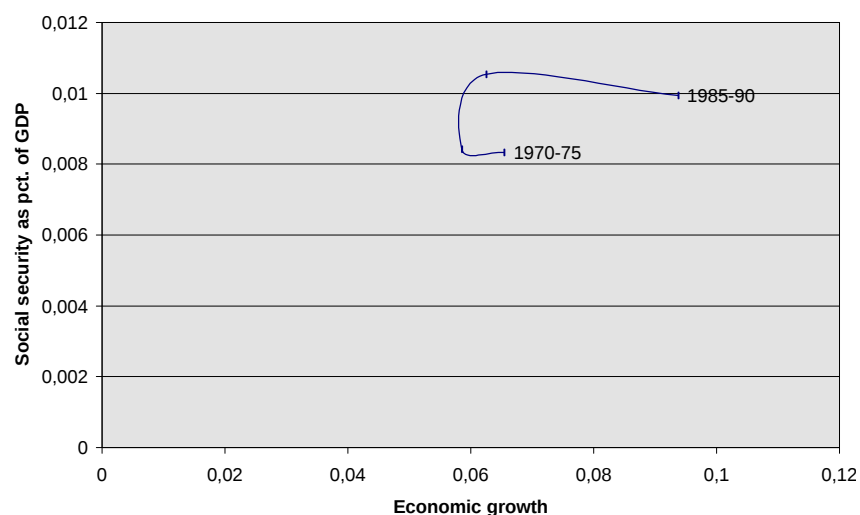
Figure 4e : Economic growth and income inequality : Thailand, 1960-1990



Income inequality in e.g. Hong Kong and Korea does not change much between 1960-65 and 1985-90, in spite of the dramatic changes in economic growth. Singapore, however, shows in the 1960s and 1970s declining inequality with declining growth, followed in the second half of the 1980s by declining inequality with increasing growth. In Malaysia the movements are rather erratic, leading in 1985-90 to a higher degree of inequality and a somewhat lower growth rate than in 1960-65. In Thailand, the picture is similar but there higher inequality in the period 1985-90, goes together with higher growth, compared to the 1960s. If any lessons can be drawn from the Asian NICs's experience it is that the ASEAN"next tier NICs"should reduce income inequality in order to step up their long-run economic growth potential.⁸

It is much more debatable whether this can be achieved by increased social security retributions. A more detailed inspection of the scatter diagram shown in Figure 2 reveals that both the observations on the Asian NICs and the ASEAN"next tier NICs"are much more dispersed than these in Figure 1, showing no tentative clusters. Also the relative importance of social security expenses and the time patterns of these expenses in relation to economic growth differ from country to country. As illustrated by Figure 5a-c, Korea, Thailand, Indonesia and the Philippines show dismally small, if not negligible, social security expenses as a pct. of GDP, while growth rates change.⁹ The picture of Singapore and Malaysia is, however, different (see Figure 5d-e). In both Southeast Asian economies the importance of social security remains virtually the same at around 5 % of GDP during the 1960s (and in Malaysia also during the 1970s) in spite of a dramatical rise in economic growth. Later¹⁰, the importance of social security rises in spite of declining or rising economic growth rates, to 29.5 % in Singapore and to 8.8 % in Malaysia. At first sight, the social security provisions of the other Asian NICs and"next tier NICs"are unduly marginal.

Figure 5a : Economic growth and social security : Korea, 1970-1990



⁸ According to a recent World Bank report on e.g., Thailand (World Bank, 1997), the relatively high and increasing income inequality in that country is expected to hamper medium-term economic growth in the future.

⁹ Data on social security expenses for Hong Kong and Taiwan are missing.

¹⁰ In Singapore as from 1970-75 and in Malaysia as from the early 1980s.

Figure 5b : Economic growth and social security : Indonesia, 1970-1990

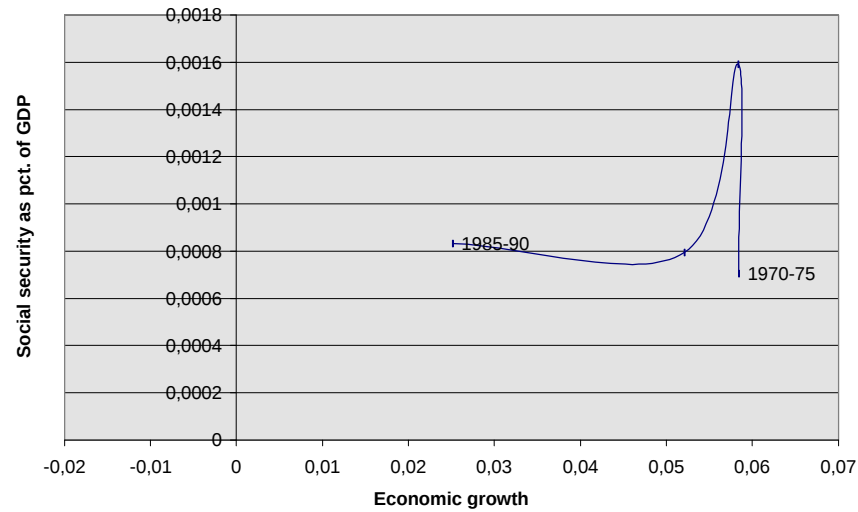


Figure 5c : Economic growth and social security : Thailand, 1970-1990

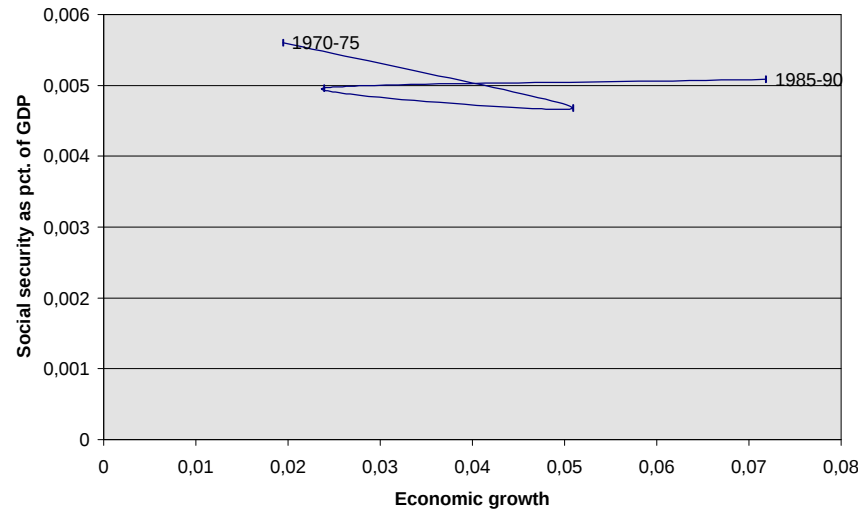


Figure 5d : Economic growth and social security : Singapore, 1960-1990

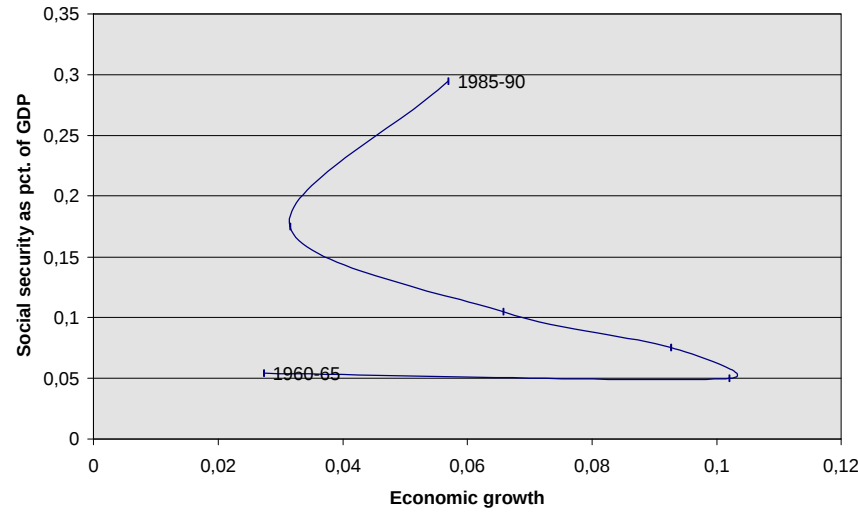
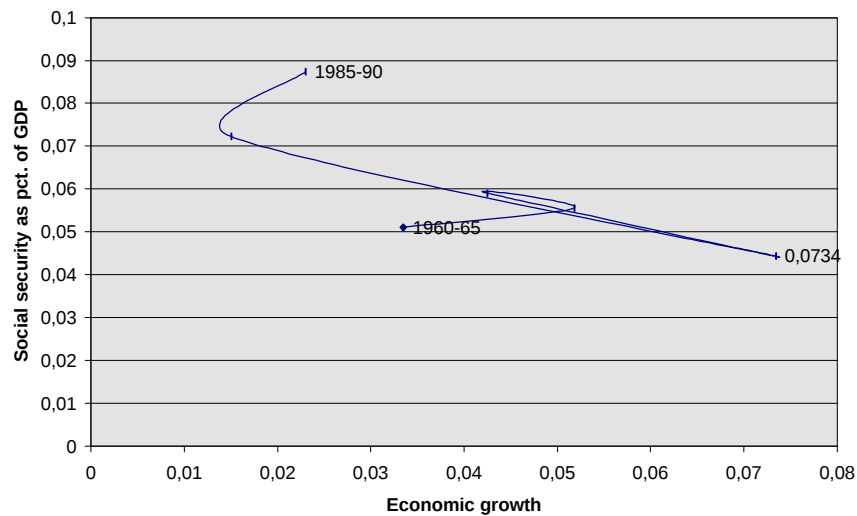


Figure 5e : Economic growth and social security : Malaysia, 1960-1990



It should be stressed that the social security systems in the Asian "tiger economies" also differ widely, as is pointed out in Tyabji (1993), in scope and coverage. Hong Kong, for instance, has all five programmes : old age, survivors and invalidity, sickness and maternity, work injury, unemployment and family allowance, but these are mostly falling under social assistance rather than social security. A rate of contribution of 40 % of gross wages and salaries finances Singapore's provident fund system : the highest rate in the region. In many countries, however, the informal sector of the economy or the category of self-employed people is relatively large and not covered by existing social security. Also : in many countries, the family is often still regarded as the provider of informal social security.

The social security performance of Singapore and Malaysia, as is illustrated by Figure 5d and 5e is also vindicated by closer inspection, but it is far from clear whether they have contributed positively to the economic growth performance of these countries.¹¹ Singapore's high social security share is obviously related to its unique Central Provident Fund. According to some, however, this huge compulsory savings scheme has led to a crowding out of voluntary saving (Wong, 1986, Lim, 1989), and, as it is not based on the insurance principle, the scheme even will create unevenness in the accumulation of individual assets, particularly of older and female workers (Tyabji, 1990). In spite of the potential positive benefits for human capital formation and productivity (Lee-Tsao, 1987), the social welfare component of the Singaporean social security system is extremely meagre (Tyabji, 1990). This is probably due to the Singapore contempt for European-type social security allowances that "spoil" and "soften" the people (Kalirajan & Wiboonchutikula, 1985 : 130).

Malaysia has a system of old age provisions under the Employees Provident Fund, as well as a worker's compensation scheme under the Employees Social Security. Contrary to Singapore, Malaysia's provident fund does not seem to have generated a significant impact on non-compulsory savings (Datta and Shome, 1981). Social security protection is, however, lacking for the rural sector, the self-employed and contract workers (like elsewhere).

By and large, to what extent social security systems in Asia are really an instrument of redistribution and of inequality reduction, remains unclear, from the data (in view of its generally limited impact) as well as from the information about its institutional organisations and administrative regulations. This might support the presumption that redistribution in Asia (if any) possibly occurs by means of other channels than social security allowances, which perhaps is also the case in developing countries in general.

5. Conclusions and topics for further research

As far as data allow us to discriminate between the different theoretical approaches of inequality and growth, the results of this first empirical research seem more in favour of the incomplete market model, in which redistribution policies, such as social security systems, have positive significance for economic growth.

Concerning Asian "tiger economies" this may imply that with economic development, increasing urbanisation and disintegration of the "extended family", they will face the problem of the provision of formal social security. Moreover, with due regard to our tentative results on Granger causality, particular provisions of social security will be beneficial to economic growth in the future. With the knowledge-intensity of production becoming more important, particular social security programmes can provide valuable incentives for risky investment in human capital (e.g., compensation for unemployment, sickness and invalidity). Other social security programmes will reduce the "barriers to entry" for lower-income groups to primary and secondary education (e.g. family allowance), thereby reducing inequality and contributing to the rise of GDP per capita. However, also public provisions other than social security programmes (e.g., education and health) should be taken into account in assessing the need for growth-enhancing redistribution schemes.

Yet, two main shortcomings of the present analysis should be resolved, in order to present more definite findings and to better support these claims.

1. Concerning the estimation method, asymptotically consistent, but not necessarily efficient parameter estimates were obtained by the instrumental variable procedure we followed. Yet, in a short time dimension panel data set as the one we used, Monte Carlo experiments (Judson and Owen, 1996) show that other estimation methods might perform better and result in a lower bias and, anyhow, our results need confirmation from more efficient estimation methods, using more orthogonality conditions.
2. We should be able to rest our conclusions on better and more comprehensive evidence, especially on redistribution, as our conclusions might be a consequence of the use of a "wrong" redistribution variable (social security contributions) the implications of which diverges between countries, especially between industrialised and industrialising countries. Finding variables which cover ap-

¹¹ In Singapore, the use of the Central Provident Fund savings to purchase housing as a means of old-age security, overstates the social security share in GDP.

appropriately redistribution policies in each country seems an effort of first importance. In its absence, one could consider, aiming at confirming the results we present here, to restrict the analysis to the countries where the redistributive dimension of the available data on social policy and social security, is unambiguous and one may be more or less certain of what is measured. To the extent that this might imply the exclusive consideration of industrialised countries, longer time series might partially compensate for a substantial loss of the cross-section dimension.

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