Inequality and Financial Crises: Some Early Findings

by

James K. Galbraith and Lu Jiaqing

Galbraith@mail.utexas.edu   Jqlu@uts.cc.utexas.edu

LBJ School of Public Affairs
The University of Texas at Austin
Austin, Texas 78713

ABSTRACT

We employ the UTIP data set on the evolution of earnings inequality in manufacturing in the
global economy to illuminate two questions. First, do regional patterns of similarity in the move-
ment of large macroeconomic aggregates, such as real GDP, imply underlying similarities of in-
dustrial structure, so that knowledge of one national economy in a GDP cluster can reasonably be
assumed to convey useful information about the others? We show that this is not generally the
case. Particularly, regional co-movement of GDP in Asia, which is very strong, masks deep dis-
similarities in underlying employment structures -- and, we argue, a range of potential sources of
transmissible financial crisis. Second, what are the consequences of crisis for inequality? We
show that crises typically generate increases in inequality, but more so in less developed countries,
and more so in regions that are more liberal in their policy regimes.

Introduction

In this short paper we examine the co-movement of macroeconomic variables, similarities and dissimilarities of industrial structure, and the movement of inequality in manufacturing earnings, on which we have annual information for much of the global economy over the past thirty years. We argue that this information can usefully illuminate the degree of economic integration across countries in a region, and that it can highlight important differences between Europe and Asia. We then examine the relationship between financial crisis and the movement of inequality. We conclude with preliminary observations relating the movement of inequality to the problem of Minsky crises in the global economy.

Macroeconomic co-movement and regionalization

Is there an Asian crisis? Or again, is there an *Asian* crisis? Is the crisis specifically *Asian, reflecting distinctive characteristics of the Asian region?* Or is it better characterized in some other way, more illuminating of the relationships between the once-rapidly growing economies of the Pacific Rim and those of the advanced industrial world?

It is normal that a sequence of financial crises be identified, in press accounts and ordinary conversation, by the large region in which it occurs. It is something else again, however, when financial decisions begin to be made on such a basis, when Atequila effects@ emanate from Mexico to the rest of Latin America, or Abamboo effects@ from Thailand to the rest of Southern Asia. And the matter becomes grave for economists when the spread of financial crisis itself becomes evidence for a common pattern of policy mistakes, so that the AAsian crisis@ becomes grist for an ideological campaign against the once-admired and once-feared AAsian development model.@ For such a campaign to be viable, the model itself has actually to have existed, and in the countries to which it is ascribed.

One way to approach this question dispassionately is to examine the co-movement of major macroeconomic variables across national economies. Two such variables, the growth of real GDP and the rate of change of inequality in manufacturing earnings are, we think, especially illuminating.

The method of cluster analysis can be applied to the rates of change of any commonly-observed time-series variable, to derive a pattern of co-movement of that variable across countries and through time. The distance matrix computed in the course of such analyses is a useful source of information on international patterns of similarity and dissimilarity. And maps based on that distance matrix can help to reveal regional patterns.

Such a map is presented as Figure 1. It shows, for the case of France, the pattern of relative similarity of GDP movements for the period 1972 to 1995 for other countries in the data set, divided into six classes of roughly equal number. A clear regionalization of GDP growth is appar-

ent: France forms part of a European/OECD cluster to which few other countries belong. The use of other OECD countries as the point of reference yields broadly similar results.

Figure 1 about here.

Figure 2 presents similarity of GDP growth to the case of Singapore, which for GDP growth may be taken as characteristic of the Asian region. Again, a distinct pattern of regionalization appears. Almost uniquely in the world economy, the Asian countries show high growth into the 1990s. As with the European case, this finding is robust with respect to choice of reference country within the region.

Figure 2 about here.

From the common similarity of GDP growth rates, one might be tempted to jump to the inference that AAsia@ now resembles AEurope@ -- an integrated regional economy. But common sense warns otherwise. While the European countries have long (and bloody) histories of compet-itive industrialization and a pattern of progress toward trade and now monetary integration that goes back to the 1950s, industrialization in Asia is comparatively new and there is little basis for thinking that economic integration has more than begun.

A direct, though crude way to examine industrial integration in Asia is simply to look at the composition of exports of the economies of the region. Table One provides this information for eight countries in 1996. Many of the countries – Korea, Malaysia, the Philippines, Singapore and Thailand, show strong concentrations in electronic products. Unless they are eating each other's semiconductors, this rather suggests that rather than intra-regional integration, what we have here is competition for the markets of the advanced countries, notably the United States and Japan. Indonesia is predominantly an energy exporter at this time.

Table One about here

A useful way to visualize the difference between the Asian rim and the OECD is to com-pare the patterns of evolution of inequality in manufacturing wages. In the case of a highly inte-grated region, two factors dictate close conformity in the movement of inequality through time. The first is a broadly similar distribution of employment across industries, so that external shocks and technological developments affect countries in similar ways, and the second is the combina-tion of integrated labor markets and relative factor price equalization in intraregional trade.

We are able to offer such a comparison, thanks to a data set we have ourselves developed (Galbraith and Lu, 1998). This data set exploits the decomposability of Theil=s T statistic and the ubiquity of information on payrolls and employment by industrial category to compute annual time-series estimates of the inter-industry change in inequality of industrial earnings, dating back at least to 1970 for over 60 countries. Conceição and Galbraith (1998) explore the properties of this measure, and argue that under quite general conditions it is likely to be a reasonable index of the change of inequality in manufacturing earnings as a whole.

Figure 3, again using the case of France as the reference case, shows that the predicted intra-regional conformity does indeed characterize Europe and also the rest of the OECD (e.g., North America and Japan).   Compared to movements of inequality in the rest of the world, the rich countries resemble each other more than they do anyone else.

Figure 3 about here.

But such co-movements of inequality do not characterize the Asian region at all. Figure 4, using Singapore once again as reference, illustrates. The Asian countries, by and large, present highly diverse pattern of change in wage structures; they do not resemble each other, on average, more than they resemble other countries elsewhere in the world. The pattern of Singapore itself is of rigid wage structures and job upgrading leading to declining inequality. That of the Philippines is of rising inequality following the political crises and liberalizations of the 1980s. Korea has a stormy history of rising and falling inequality whose industrial basis is explored in Galbraith and Kim (1998).   And Indonesia and Malaysia experienced equalizations in the 1990s that appear to have been due to rapid growth in employment in the construction and export sectors, but not equalization of wage rates.[1] Figure 4 illustrates the non-regional character of inequality movements in Asia and Figure 5 presents the underlying time-series for the Asian countries.

Figures 4 and 5 here.

Without moving to sweeping inferences at this stage, these measurements do point toward a preliminary synopsis of the Asian development experience leading up to the crisis. First, it seems reasonable to infer that all the Asian countries experienced common factors of rapid external demand growth and rapidly growing foreign direct and portfolio investment. This was financial euphoria, founded on a shallow sense of geography, that itself fueled an ongoing convergence of GDP growth rates.   In this way, we can understand the continuation of rapid GDP growth as a whole through the mid-1990s, and also the common experience of real estate and commercial office building booms so evident in the major urban centers of the region at this time.

On the other hand, the dissimilarity of inequality movements suggests to us that this common pattern of export and investment growth was overlaid over fundamental dissimilarities of three kinds. First, there are dissimilarities of income level and manufacturing penetration, so that an export and building boom might comprise a disproportionately larger share of economic activity in Bangkok or Djakarta than, say, in Singapore or Seoul. Asian development, even if it were fundamentally of one kind -- state-directed and export-promoting -- occurred in waves, and at any

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[1] As a rule, the Asian countries share Singapore=s characteristic of resembling Japan (and the OECD) on this measure more than they resemble each other; there is thus a hub-and-spoke character to the evolution of inequality in the region.

4

one moment latecomers do not resemble the earlier cases even if they are following a similar track.

Second, the countries were not in fact evolving along similar lines. There were and are differences in industrial structure; for instance, no other Asian country has emulated Korea=s emphasis on heavy industrialization, itself partly designed to meet that nation=s unique security threat. For this reason external shocks to, say, textile or food prices or in the semiconductor industry might have very different impacts on wages in the Phillippines than in, say, Malaysia.

This point is illustrated in Figure 6, which shows the evolution of a measure of diversity or specialization in industrial development over time. The measure is a Herfindahl index, or the sum of squared shares in industrial employment of each of twenty or so two-digit ISIC industrial categories. Since the ISIC categories are themselves designed to represent effectively the industrial structures of the most advanced countries, a Herfindahl index built around these categorizations will be typically lower for diversified and richer countries and higher for those countries that are specialized, usually in lower-wage primary sector industries. And the index for any given country will decline as it diversifies, or rise as it specializes in particular industrial sectors.

As Figure 6 shows, the Asia region shows great diversity in this measure of industrial change. Certain countries, for instance Korea and China as well as Indonesia and Hong Kong, show dramatic declines in the measure, indicating rapid diversification of industrial structure. Others, notably Malaysia and Singapore, show strong movement in the opposite direction. Still others – Philippines – show little evidence of change in this measure. Taiwan shows movement first in one direction and then in the other.

Figure 6 about here.

Third and finally, there is an almost complete lack of integration of industrial and construction labor markets, excepting perhaps the partial inter-linkage of Malaysia, Singapore and Indonesia. For this reason, relative factor price equalization need not and in fact did not occur.

The next question is, how, if at all, did the dissimilarity in industrial structure contribute to the crisis? The difficulty that differences of industrial structure pose for the development of financial instability concerns, essentially, asymmetries of information across small-country banking systems. If a German banker wishes to invest in Holland, the similarity of industrial conditions, integration of labor markets and other similarities in the underlying situation of the two countries lead to a high level of confidence that the banker can, in fact, judge the Dutch situation correctly. Moreover, if something does go wrong in Holland, the German banker is very likely to survive, simply because the exposure of a large country bank in a much smaller country will rarely be sufficiently large in itself to threaten the large-country bank.

But if a Korean banker wishes to invest, for the first time, in Indonesia, he is likely to know from direct experience in Korea very little that is useful for judging the Indonesian scene.

Any number of things can go wrong that will be from the Korean point of view, unforeseen. External shocks, speculative attacks, differences in the growth rate of demand across industries, developments in the internal labor market, and consequent political events in Indonesia will all be essentially unpredictable on the basis of Korean experience. And if the Korean banker is operating on the misleading impression conveyed by common high GDP growth that Korea and Indonesia were operating from a similar development playbook, then there is the risk that Korean banks may become dangerously, even fatally overexposed in the Indonesian market.

Something like this seems to have happened. And the lesson of over-investment across Asian banking systems suggests to us that financial integration across highly dissimilar developing countries without underlying integration of the economies themselves is *per se* a dangerous proposition. Very large Western banks, backed by lenders of last resort, may well survive the carnage of a Minsky shock in much smaller places. But national banking systems like that of Korea that become exposed elsewhere in their own region as a result of financial deregulation run the risk that they will become prime vectors for the transmission of financial shocks from far away, back to home.

Effects of financial crises on inequality

The next question our data set enables us to examine is the relationship between financial shocks and industrial inequality.

There is, of course, no reason in orthodox economics to expect any such relationship: why should an external macroeconomic shock have distributional effects? But in practice, financial shocks resulting in capital flight and currency devaluations for developing countries do have such effects, along the lines of causality laid out by Yotopoulos in his important book on exchange rate parity and the development process (Yotopoulos, 199x). Low-wage workers suffer more than relatively high-wage workers, and inequality increases. Garza-Cantu has recently computed month-to-month changes in earnings inequality for Mexico, and the three large devaluations of modern times stand out as precipitators of substantial increases in the inequality series.

We find that the effect of financial crisis on inequality is quite general. Using data set of crises compiled by Kaminsky and Reinhart (1996), in which financial crisis is defined as a weighted average of exchange rate changes and reserve changes, we have identified 34 distinct financial crises in the countries and during the time period covered by our analysis. The mean increase in inequality in the two-year period immediately following such a crisis is 16.2 percent, as compared with 3.2 percent in years during which crises did not occur. This difference is highly significant using both a t-test ($p<.007$) and a non-parametric Kolmogorov-Smirnov test ($p<.05$).

Interestingly, there appear to be substantial differences in the responsiveness of wage structures to crisis across countries. In Europe, inequality rose following crises only 46 percent of the time, and the rises are greatest in fairly peripheral countries, Turkey and Iceland. Denmark,

Finland, Norway and Spain experienced a sequence of crises without experiencing increased inequality thereafter. In Latin America, at the other extreme, crises raised inequality 73.5 percent of the time; only Argentina reacted to crises with falling inequality. Asia, perhaps not surprisingly, is a middle case: crises raised inequality there 62.5 percent of the time. Table One presents this evidence.

Table Two about here.

Conclusions

We believe these inferences can now be drawn:.

First, co-movement of GDP growth in Asia did not occur because of fundamental similarities in economic policy or in the stages of economic development across countries, but rather in spite of very large differences. To judge from similarities of industrial structure or co-movements of inequality, Europe and the OECD are much more integrated internally than is Asia. Asian co-movement of GDP is thus perhaps best seen as a demand phenomenon affecting a hub-and-spoke system, in which the low-income Asian economies grew at first by supplying diverse products to high income countries, and later through real-estate and office construction booms.

Second, once Asian countries liberalized their financial systems, financial crisis in Asia was a greater risk than in Latin America, and both regions a greater risk than Europe or the OECD, because diversification of Asian financial institutions into other Asian markets opened them to systematic risks which they could not properly assess and against which they were not properly protected. Diverse economies can each individually fail in a diversity of ways, yet when one fails, the financial cross-linkages can cause severe problems for, and ultimately capital flight from, all the others. We do not of course offer direct evidence here for this proposition, but we think it is broadly consistent with other known facts about the evolution of the Asian crisis.

Third, crises tend to raise inequality. But they raise it more in the most deregulated labor markets, and less in more highly regulated ones. Thus financial crises have had worse effects on Latin American workforces than on Asians, and worse on Asians than on the organized and politically powerful workers of the North. Whether this ordering will hold true as data from the latest round of crises come in, remains to be seen. But we think it points to a fundamental fact about the advanced countries that proponents of structural adjustment plans for developing nations tend to overlook. Namely, that it is the rich, advanced, and successful economies that have the best-paid workers, the most stable wage structures, and the strongest forms of insulation from economic shocks, including financial shocks.

We do not think this is entirely accidental.

Acknowledgment

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GDP Growth (1972-1995)
Similarity to France

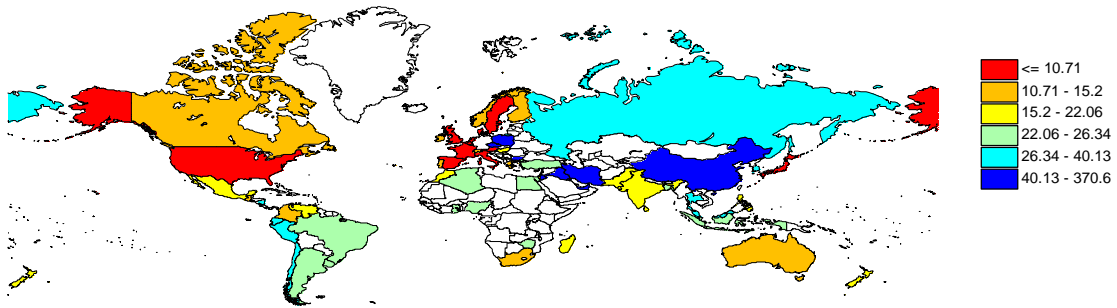|	
■ (red)	<= 10.71
■ (orange)	10.71 - 15.2
■ (yellow)	15.2 - 22.06
■ (green)	22.06 - 26.34
■ (cyan)	26.34 - 40.13
■ (blue)	40.13 - 370.6

Figure 1. Similarity of patterns of GDP growth in the world economy, 1972-1995, with France as the reference case.

GDP Growth (1972-1995)
Similarity to Singapore

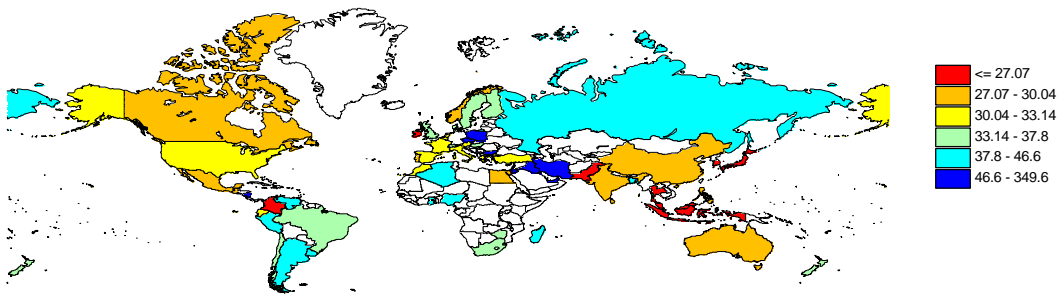|	
■ (red)	<= 27.07
■ (orange)	27.07 - 30.04
■ (yellow)	30.04 - 33.14
■ (green)	33.14 - 37.8
■ (cyan)	37.8 - 46.6
■ (blue)	46.6 - 349.6

Figure 2. Similarity of patterns of GDP growth in the world economy, 1972-1995, with Singapore as the reference case.

Changes in Inequality
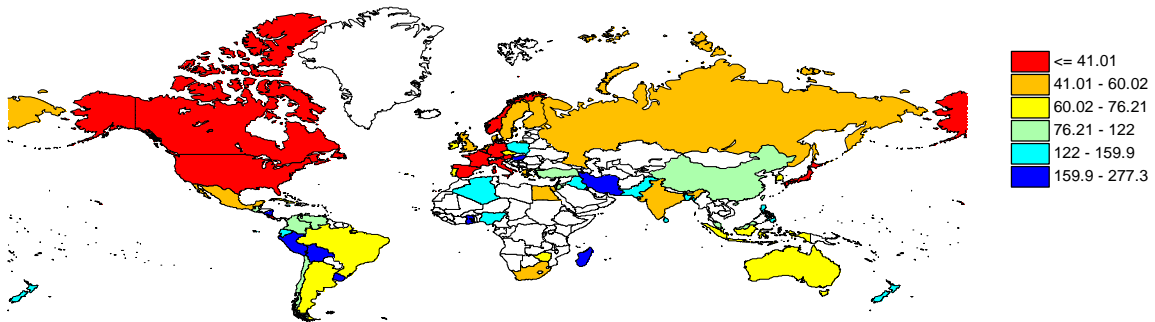## Similarity to France

Figure 3 Similarity of changes in industrial earnings inequality, 1972-1995, with France as the reference case

Changes in Inequality
Similarity to Singapore
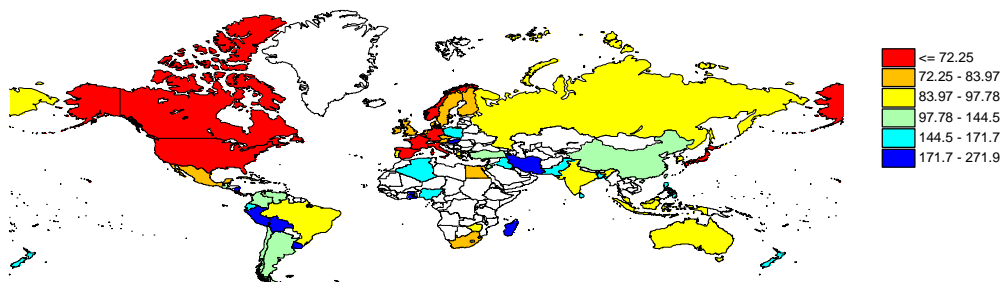
Figure 4.   Similarity of changes in industrial earnings inequality, 1972-1995, with Singapore as the reference case. Note the lack of regional similarities in Asia.

Inequality in Asia
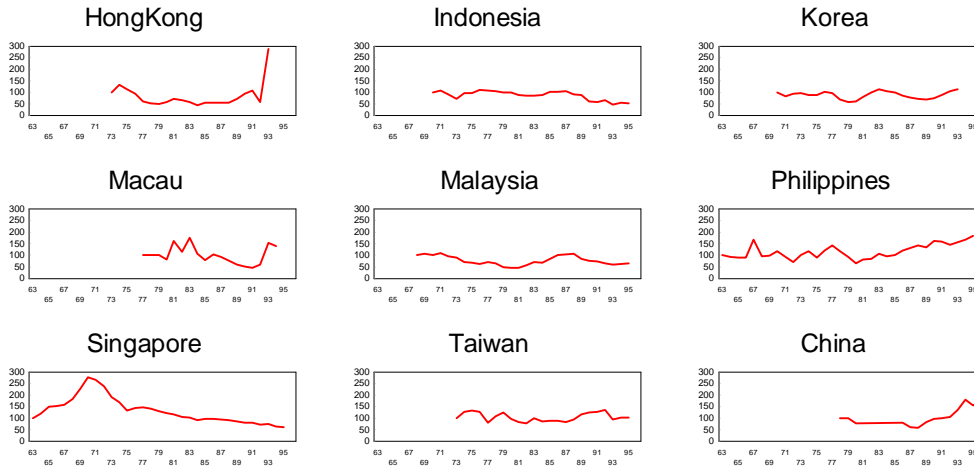
Figure 5. Evolution of industrial earnings inequality in selected countries of Asia.

Industrial Change in Asia

Figure 6. Industrial diversification or specialization in selected Asian countries as measured by the Herfindahl index, applied to standard industrial classifications.

11

Table One. Major Exports of Selected Asian Countries, 1996

Table 1 Top Ten Exports as the Percentages of Total Exports in Southeast Asia (1996)

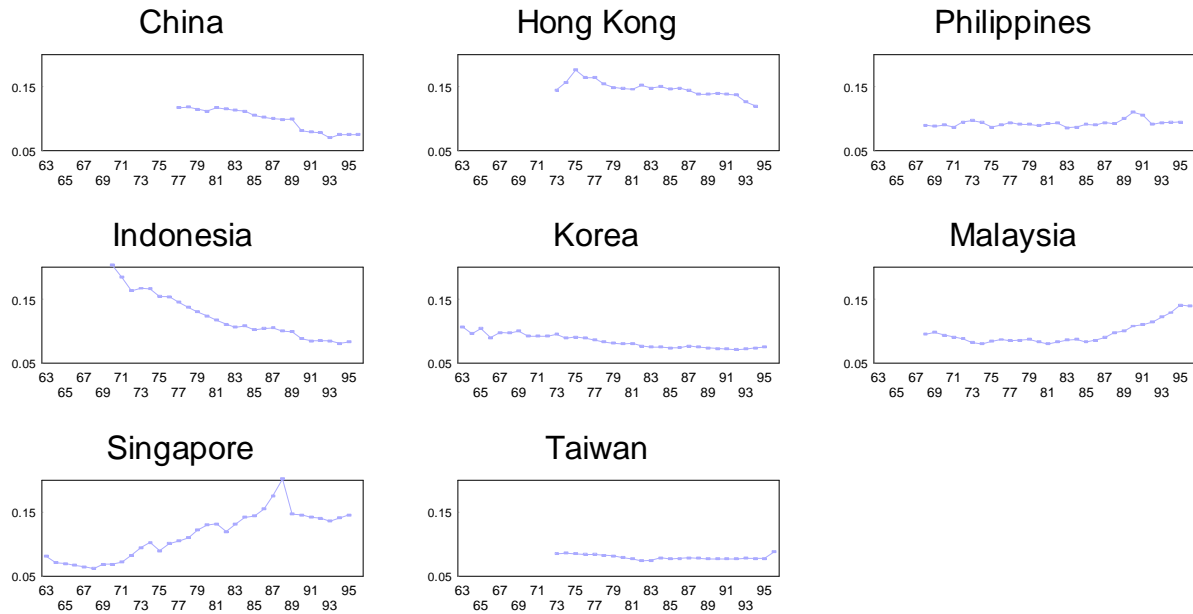| China		Hong Kong		Indonesia		Korea	
FOOTWEAR	4.70	ARTICLES OF APPAREL NES	10.31	PETROL./BITUM. OIL,CRUDE	10.38	VALVES/TRANSISTORS/ETC	13.34
BABY CARR/TOY etc	4.30	WOMEN/GIRL CLOTHING WVEN	8.60	NATURAL GAS	8.08	PASSENGER CARS ETC	7.01
ARTICLES OF APPAREL NES	4.22	VALVES/TRANSISTORS/ETC	7.85	VENEER/PLYWOOD/ETC	8.01	SHIPS/BOATS/ETC	5.49
MENS/BOYS WEAR, WOVEN	4.20	MENS/BOYS WEAR, WOVEN	7.11	FOOTWEAR	4.41	MAN-MADE WOVEN FABRICS	4.84
WOMEN/GIRL CLOTHING WVEN	3.86	WATCHES AND CLOCKS	5.65	NATURAL RUBBER/LATEX/ETC	3.85	GOLD NON-MONETARY EX ORE	4.09
TELECOMMS EQUIPMENT NES	3.10	OFFICE EQUIP PARTS/ACCS.	4.82	COPPER ORES/CONCENTRATES	3.51	COMPUTER EQUIPMENT	3.63
COMPUTER EQUIPMENT	2.44	TELECOMMS EQUIPMENT NES	3.94	HEAVY PETROL/BITUM OILS	3.02	TELECOMMS EQUIPMENT NES	3.40
COTTON FABRICS, WOVEN	1.94	WOMEN/GIRL WEAR KNIT/CRO	3.88	FIXED VEG OILS NOT SOFT	2.67	ELECTRICAL EQUIPMENT NES	3.05
HEADGEAR/NON-TEXT CLOTHG	1.90	COTTON FABRICS, WOVEN	2.99	MAN-MADE WOVEN FABRICS	2.31	HEAVY PETROL/BITUM OILS	2.84
PETROL./BITUM. OIL,CRUDE	1.85	JEWELLERY	2.72	MENS/BOYS WEAR, WOVEN	2.27	FLAT ROLLED IRON/ST PROD	1.70

Malaysia		Philippines		Singapore		Thailand*	
VALVES/TRANSISTORS/ETC	17.92	VALVES/TRANSISTORS/ETC	29.84	COMPUTER EQUIPMENT	18.46	VALVES/TRANSISTORS/ETC	5.21
OFFICE EQUIP PARTS/ACCS	6.03	OFFICE EQUIP PARTS/ACCS.	8.17	VALVES/TRANSISTORS/ETC	15.80	COMPUTER EQUIPMENT	5.09
COMPUTER EQUIPMENT	5.26	COMPUTER EQUIPMENT	4.53	OFFICE EQUIP PARTS/ACCS.	7.56	NATURAL RUBBER/LATEX/ETC	4.36
TELECOMMS EQUIPMENT NES	5.07	TELECOMMS EQUIPMENT NES	3.12	HEAVY PETROL/BITUM OILS	7.55	CRUSTACEANS MOLLUSCS ETC	4.28
FIXED VEG OILS NOT SOFT	4.60	ARTICLES OF APPAREL NES	2.78	TELECOMMS EQUIPMENT NES	4.93	OFFICE EQUIP PARTS/ACCS.	4.16
PETROL./BITUM. OIL,CRUDE	3.93	FIXED VEG OILS NOT SOFT	2.77	SPECIAL TRANSACTIONS NES	2.48	FOOTWEAR	3.83
RADIO BROADCAST RECEIVER	3.92	WOMEN/GIRL CLOTHING WVEN	2.54	ELECTRICAL EQUIPMENT NES	2.09	RICE	3.46
SOUND/TV RECORDERS ETC	3.55	ELECTRICAL DISTRIB EQUIP	2.35	ELECTRIC CIRCUIT EQUIPMT	1.98	FISH/SHELLFISH,PREP/PRES	2.82
VENEER/PLYWOOD/ETC	2.78	MENS/BOYS WEAR, WOVEN	1.92	RADIO BROADCAST RECEIVER	1.53	TELECOMMS EQUIPMENT NES	2.72
TELEVISION RECEIVERS	2.67	FRUIT/NUTS, FRESH/DRIED	1.70	TELEVISION RECEIVERS	1.44	ARTICLES NES OF PLASTICS	2.18

Table 2 Currency Crises and Changes in Income Inequality

		Chnages in Theil Indices(%)				Chnages in Theil Indices(%)				Chnages in Theil Indices(%)
Argentina	71-72	1.99	Denmark	70-71	2.93		Indonesia	78-79	(3.02)	
	75-76	15.89		73-74	(0.03)			82-83	1.72	
	80-81	11.24		79-80	(5.76)			86-87	2.12	
	82-83	(13.49)	Finland	72-73	3.19		Malaysia	75-76	(0.81)	
	86-87	18.90		82-83	3.85		Philippines	69-70	21.70	
	88-89	22.40		91-92	(4.24)			83-84	(10.77)	
	89-90	(15.49)		92-93	8.02			84-85	4.55	
Bolivia	82-83	5.43	Norway	73-74	1.51			85-86	19.75	
	83-84	112.42		77-78	(4.89)			Increase	62.50%	
	84-85	35.24		85-86	(6.54)			Decrease	37.50%	
Brazil	82-83	4.36	Spain	82-83	(2.60)					
	86-87	7.17		91-92	(2.31)					
	89-90	9.51		92-93	(16.06)					
	90-91	10.20	Sweden	77-78	(10.13)					
	91-92	(9.07)		81-82	4.67					
Chile	71-72	(34.23)		82-83	0.38					
	72-73	(5.36)		92-93	(3.37)					
	73-74	27.12	Turkey	70-71	22.02					
	74-75	4.82		79-80	(26.80)					
	75-76	36.82		93-94	(0.76)					
	82-83	38.33	Iceland	74-75	15.32					
	83-84	13.52		77-78	4.31					
Colombia	82-83	17.65		83-84	40.11					
	84-85	11.75		84-85	(6.27)					
Mexico	76-77	7.04		Increase	46%					
	81-82	10.25		Decrease	54%					
	82-83	(10.83)								
Peru	76-77	42.26								
	87-88	153.44								
Uruguay	71-72	(0.92)								
	82-83	(51.17)								
Venezuela	83-84	7.79								
	86-87	(0.24)								
	88-89	65.81								
	Increase	73.50%								
	Decrease	26.50%								