Macro Topics in Development and Transition –2005/06 Handout No. 4

## External Debt and the Developing Countries - Topics

1. Basic Data on Debt Levels
2. Theoretical Levels of "Sustainable" Debt
3. Notes on Damage Caused by Excessive Debt
4. Some Theory on Debt Relief
5. Notes on the HIPC Initiative
6. Two Subsidiary Issues

Topic 1: Basic Facts

- Low Income Countries (LICs) have low ABSOLUTE Levels of External Debt

- LICs have a Large Proportion of Debt to (i) Official Bilateral Creditors and (ii) Multilateral Agencies but not much to (iii) Private Creditors

- Most remaining LIC Debt is very concessional (low cost)

- But in spite of this the debt burdens are excessive in some 41 Countries (HIPCs)

- Causes are various: Civil wars, bad Fiscal management, Corruption etc.

Figure 5: Composition of gross disbursements to HIPCs
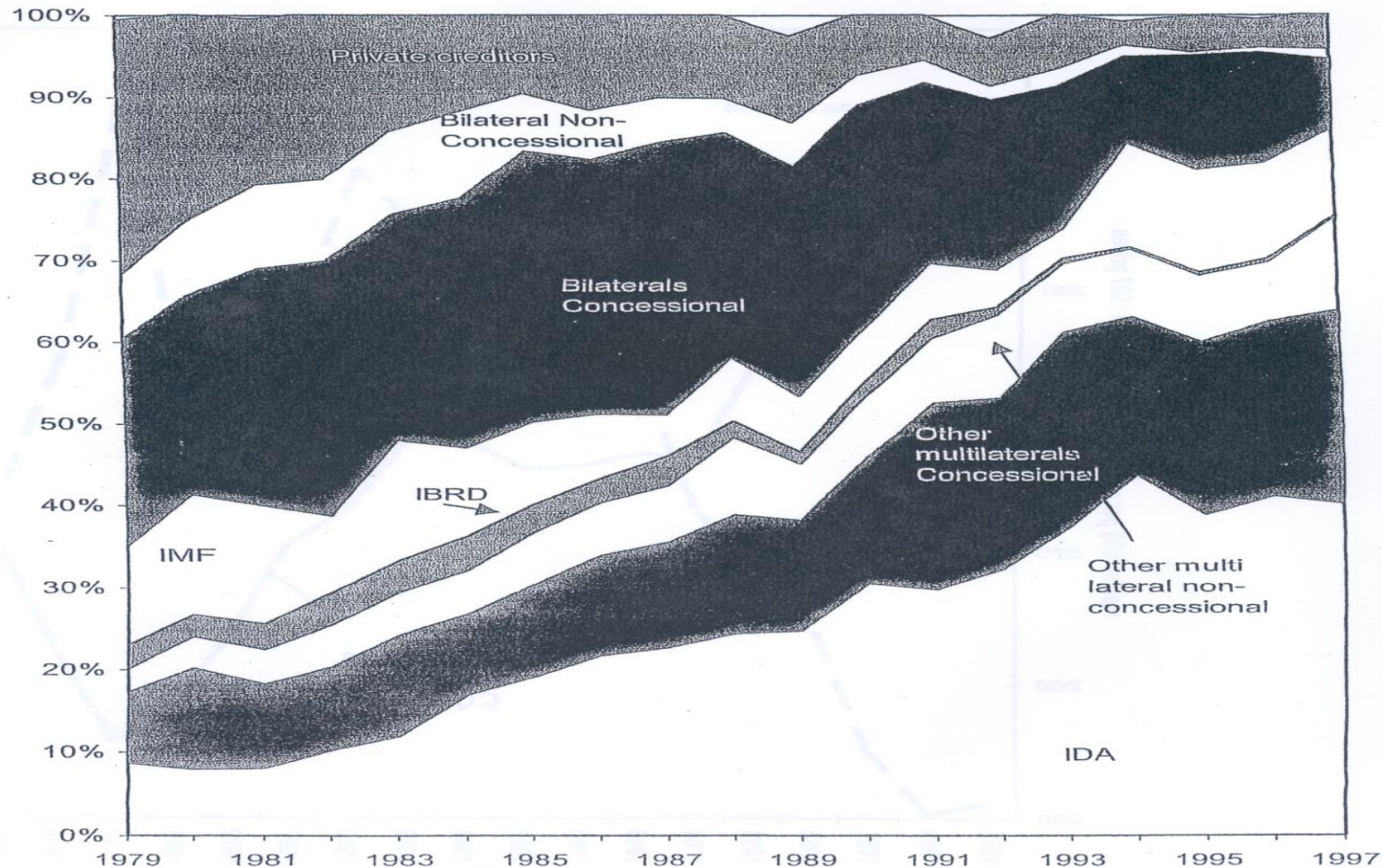
Debt Relief 1989 - 1997 = $33 b
New Borrowing " — " = $41 b.

Table 4. Evolution of Paris Club Rescheduling Terms

	Middle-Income Countries	Lower-middle income countries (Houston Terms) 1/	Low-Income Countries 2/																
			Toronto Terms Options			London Terms 3/ Options				Naples terms — 67 percent NPV debt reduction 4/ Options — DSR Maturing					Lyon terms — 80 percent NPV debt reduction Options 5/			
			DR	DSR	LM	DR	DSR	CMI	LM	DR	Flows	Stocks	CMI	LM	DR	DSR	CMI	LM
Implemented		Since Sept. 1990	Oct. 1988- June 1991			Dec. 1991 - Dec. 1994				Since January 1995					Since December 1996			
Grace	5-6 1/	up to 8 1/	8	8	14	6	--	5	16 6/	6	--	3	8	20	6	8	8	20
Maturity	9 1/	15 1/	14	14	25	23	23	23	25	23	33	33	33	40	23	40	40	40
Repayment schedule	Flat/ graduated	Flat/ graduated	-------- Flat -------			------ Graduated --------				---------- Graduated ---------					------- Graduated -----			
Interest rate 7/	M	M	M	M	R 8/	M	R 9/	R 8/	M	M	R 10/	R 10/	R 10/	M	M	R 11/	R 11/	M
Reduction in net present value	--	--	33	20-30 12/	--	50	50	50	--	67	67	67	67	--	80	80	80	--
Memorandum items: ODA credits																		
Grace	5-6	up to 10	14	14	14	12	12	12	16	16	16	16	16	20	16	16	16	20
Maturity	10	20	25	25	25	30	30	30	25	40	40	40	40	40	40	40	40	40

Source: Paris Club.

1/ Since the 1992 agreements with Argentina and Brazil, creditors have made increasing use of graduated payments schedules (up to 15 years maturity and 2-3 years grace for middle income countries; up to 18 years maturity for lower middle-income countries.

2/ DR refers to the debt reduction option; DRS to the debt-service reduction option; CMI denotes the capitalization of moratorium interest; LM denotes the nonconcessional option providing longer maturities. Under London, Naples and Lyon terms there is a provision for a stock-of-debt operation, but no such operation took place under London terms.

3/ These have also been called "Enhanced Toronto" and "Enhanced Concessions" terms.

4/ Most countries are expected to secure a 67 percent level of concessionality; countries with a per capita income of more than US$500, and an overall indebtedness ratio on net present value loans of less than 350 percent of exports may receive a 50 percent level of concessionality decided on a case-by case basis. For a 50 percent level of concessionality, terms are equal to London terms, except for the debt-service reduction option under a stock-of-debt operation which includes a three-year grace period.

5/ These terms are to be granted in the context of concerted action by all creditors under the Debt Initiative for Heavily Indebted Poor Countries (HIPCs).

6/ Before June 1992, 14 years.

7/ Interest rates are based on market rates (M) and are determined in the bilateral agreements implementing the Paris Club Agreed Minute. R = reduced rates.

8/ The interest rate was 3.5 percentage points below the market rate or half of the market rate if the market rate was below 7 percent.

9/ Reduced to achieve a 50 percent net present value reduction.

Topic 2: Sustainable Debt Levels

Recent Theoretical Literature includes:

Buiter (1985), *Economic Policy*, No.1

Blanchard et al (1990) *OECD Economic Studies*. Vol 15

Chalk (2000), *Journal of Monetary Economics*, Vol 45(2)

Rankin and Roffia (2003) *The Manchester School*, Vol 71 (3)

Most papers elaborate on the key tension (in defining sustainability) between the growth rate (of GDP or government revenues) and the real interest rate on debt. Variants on this include analysis of types of debt (e.g. perpetuity bonds versus normal Treasury bills and bonds) and open versus closed economy cases

Influences on the Debt ratio
(*van Wijnbergen accounting approach*)

Define the Debt:GDP ratio as "b" and measure it in LOCAL Currency

Then

$$b = \frac{\dfrac{D\$}{P\$} \cdot \dfrac{EP\$}{P_d}}{Y} = \frac{D\$.E}{P_dY}$$

Where

$$\frac{EP\$}{Pd} = \text{the real Exchange Rate}$$

And D\$ = the Debt in Dollar Terms

Continued

Note: A real devaluation will increase the burden of debt even if there is no new borrowing (no increase in D$)

But a nominal devaluation that is fully matched by a rise in Pd has no effect on the Debt ratio

Three Main Influences on the Debt ratio ("b")

• **Non-Interest Current Account Deficit/Surplus (NICA) will Raise/Lower "b"**

• **Interest Rate on Debt ("r") INCREASES "b" even if Current Account is balanced**

• **Income (GDP) Growth ("n") LOWERS "b" (via denominator) So key is (r-n)**

• **Real Devaluation RAISES "b" but if it generates a higher "n" will also have effects in the opposing direction.**

Export Measures of Sustainability

Similar Logic can be applied to understand the Dynamics of the Debt/Export ratio.

Merely replace "n" by "ne" where "ne" is the growth rate of Exports in Nominal Terms.

HIPC Criteria are:

• NPV Debt/Exports < 200/250% reduced to 150% in 1999 (HIPC II)

• Debt Service/Exports < 20/25%

An Equation for the Debt Ratio

Source is S. van Wijnbergen, in *World Bank Economic Review*, Vol 3 No 3, 1990

$$b* = -NICA + ((r^{\$} - P^{\$}) - n)b* + \frac{\dot{e}}{e}.b$$

Sustainable Debt ratios require an appropriate combination of the right-hand side variables.

Solvency of Countries

This requires an ABILITY to pay taking account of the assets and liabilities of the country. It requires that discounted future income(Y) net of expenditures (C+I+G) exceed the initial debt level. i.e.

$$\sum_{t=t_1}^{t=t_n} \left[\frac{Yt - Ct - It - Gt}{(r^\$ - P^\$) - n} \right] > b^*{}_{t_1} \qquad [5]$$

But the numerator here = NICA, so [5] gives us the proposition that

$$NICA > [(r^\$ - P^\$) - n]b^* \qquad [6]$$

Insights from this are fairly obvious

1.Countries with LOW b* to start with are more likely to be solvent

2.Countries with HIGH growth rates (n) are more likely to remain solvent

3.Countries with HIGH borrowing costs ($r^\$-P^\$$) will find it less easy to remain solvent

Example: $b^*=50\%$; $r^\$-P^\$=8\%$; $n=6\%$

Solvency requires NICA > 1% of GDP

NOW Experiment with different values of the parameters to see how the demands of solvency increase reduce

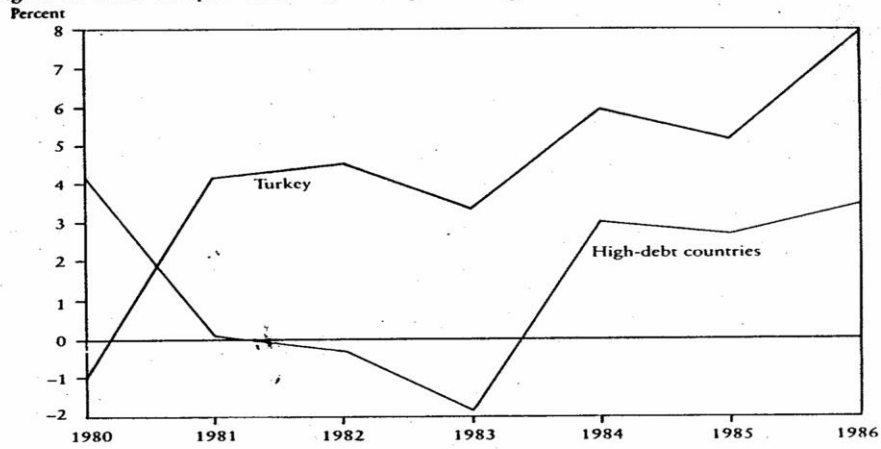# Examples based on the formula

A. Growing out of High Debt

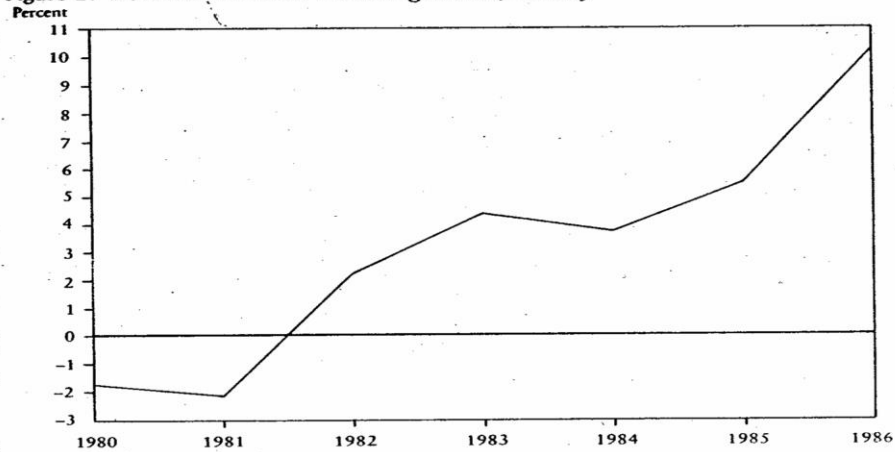e.g.Korea and Turkey in the 1980s

versus

B. Deflating out of High Debt

e.g. Latin America in the 1980s

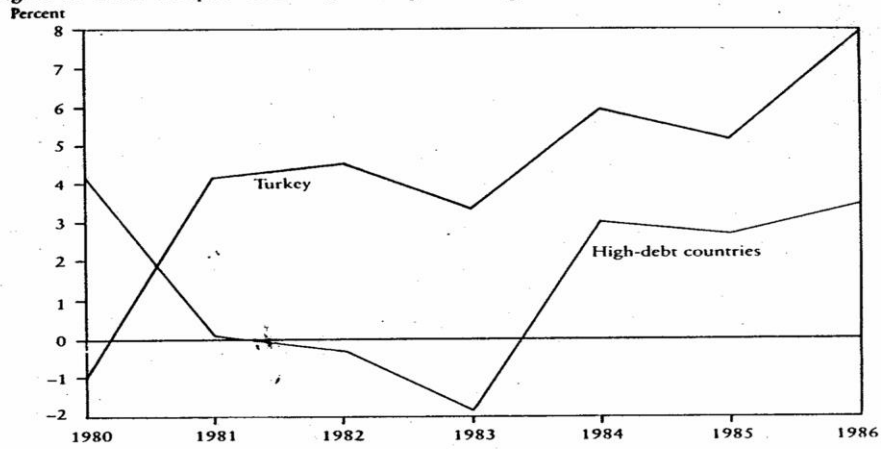**Figure 1.** *Real Output Growth, Turkey and High-Debt Countries*

Percent

Source: Anand and others (forthcoming).

Figure 2. *Real Interest Rate on Foreign Debt, Turkey*

Percent

Note: Corrected for changes in exchange rates among Turkey and its trading partners.

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Figure 1. *Real Output Growth, Turkey and High-Debt Countries*

Percent

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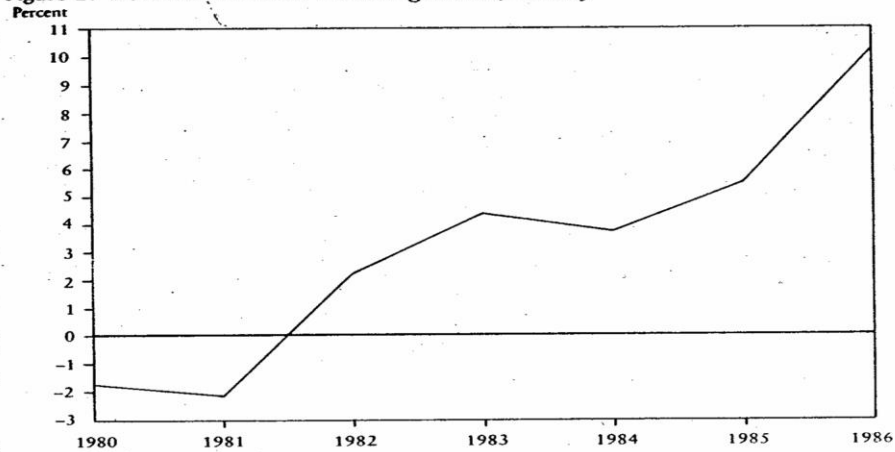
Figure 2. *Real Interest Rate on Foreign Debt, Turkey*

Percent

Note: Corrected for changes in exchange rates among Turkey and its trading partners.

Table 1. *Measures of the Debt Burden, Turkey and Fifteen "High Debt" Countries*

Measure	1980	1981	1982	1983	1984	1985	1986
Turkey (billions of dollars)							
Debt	16.3	16.9	17.6	18.2	20.8	25.5	32.5
Medium- and long-term	13.8	14.7	15.9	16.0	17.6	20.8	25.6
Short-term	2.5	2.2	1.8	2.3	3.2	4.8	6.9
Debt-burden indicators (percent)							
Debt/GNP	28.0	28.6	32.8	35.6	41.5	47.9	55.9
Debt/exports	284.1	198.3	175.0	192.9	180.5	194.52	60.5
Current account surplus/GNP	−5.04	−2.83	−1.55	−3.57	−2.81	−1.90	−2.63
Noninterest current account surplus/GNP	−3.87	−0.81	1.17	−0.36	0.36	1.39	1.04
Countries with recent debt-servicing problems (percent)							
Debt/GDP	33.6	38.5	45.5	50.0	51.1	52.2	54.8
Debt/exports	151.2	185.8	241.5	254.3	247.2	263.9	302.4
Current account surplus/GDP	−3.6	−5.9	−5.5	−2.0	−0.9	−0.5	−1.8
Noninterest current account surplus/GDP	−0.5	−1.7	−0.5	2.8	4.1	4.2	2.5

Note: For comparability the debt figures reported here for Turkey refer to gross debt. The rest of the paper uses net debt (see footnote 1 in the text). The debt-export ratio refers to year-end debt and to exports of goods and services during the year. The countries with recent debt-servicing problems are those that incurred external payment arrears in 1985 or rescheduled their debt during the period from end-1983 to end-1986 (see International Monetary Fund, various years).
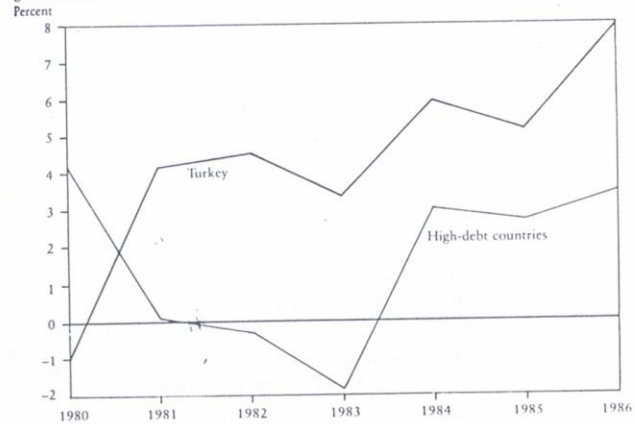
Sources: Undersecretariat of Treasury and Foreign Trade, Central Bank, Turkey; International Monetary Fund (various years).

interest rates exceed (fall short) of the economy's real growth rate. In this, the world environment has turned distinctly unfavorable. Real interest rates, negative by any measure in the 1970s, have shot up in the 1980s. Even for a fast grower like Turkey, real interest rates on external debt now outstrip the economy's real growth rate (figure 2).

Another striking difference between Turkey and most high-debt countries is in the ratio of debt to exports. For most debtor countries, that ratio rose in line with the debt-output ratio. But Turkey, alone among the debtor countries, saw its debt-export ratio fall by a third between 1980 and 1986, with little rise afterward. Export growth caused the turnaround. Turkey's ratio of exports (of goods and nonfactor services) to GNP hovered between 5 and 7 percent between 1967 and 1980. With the reform measures, exports jumped to 11 percent of GNP in 1980 and increased further until they reached 20.7 percent of GNP in 1985. They fell back to 18 percent in 1986 because of developments in the Middle East, but more than recovered in 1987—having grown by an estimated 30 percent in real terms over the 1980–87 period. So, while Turkey's debt-output ratio has steadily deteriorated, its debt-export ratio has sustained the substantial improvements in 1980 and 1981.
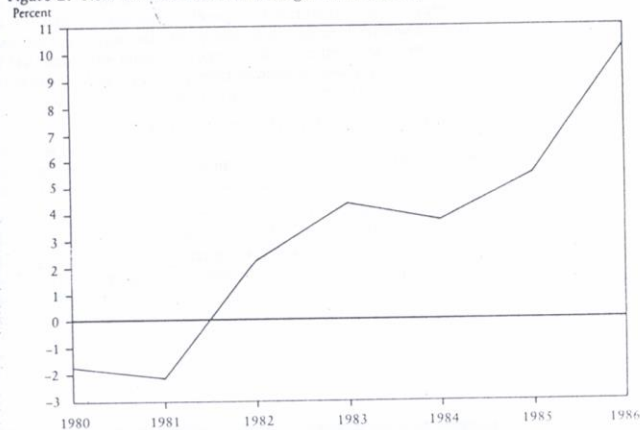
A major contributing factor to Turkey's successful export drive was the real

Figure 1. *Real Output Growth, Turkey and High-Debt Countries*

Source: Anand and others (forthcoming).

Figure 2. *Real Interest Rate on Foreign Debt, Turkey*

Note: Corrected for changes in exchange rates among Turkey and its trading partners.

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The Creditworthiness of Countries

This is a more demanding condition based on whether countries are PERCEIVED as likely to pay even if they remain solvent

• Lenders (and credit rating agencies such as Standards and Poors) who assess this will typically look at variables as in the solvency ratio (e.g. a high growth rate will increase creditworthiness

• plus FOREX earnings (mainly exports) as a signal of the country's access to the necessary currency in which to make payment (e.g. fast growth of exports is better than a fast growth of other components of GDP)

Topic 3: Theory: High Debt and Economic Performance

Four Main Mechanisms:

- VIA Adverse Expectations – High External Debt supports expectations of Lower Future Levels of Govt. Expenditure; Higher Future Levels of Inflation and Other Taxation; and the need for ER Depreciation. This results in lower post-tax expected returns on Domestic Investment and possibly Capital Flight. (F)

- Via Costs of Future Outlays. When Govt. is insolvent i.e. the F>MV, then Govt Spending is rationed in terms of any Marginal Unit of spending – the opportunity cost of any additional unit of resource is very high. The Discount rate>Market rate of interest Any debt repayments impose excessive costs on the economy (e.g. tax) (F – MV)

- Via Uncertainty. The Insolvency Situation creates great uncertainty about possible Regime Shifts e.g. changes in policy, how large will be the resources committed to debt service, will new external funding be obtained to help and at what cost? Again the result is less investment (F-MV)

The FACE and MARKET Value of Debt

$$F = (F - MV) + MV$$

where $F =$ the Face (Original) Value and MV

$=$ the Market value of Debt

Note:

- where F>MV, the creditworthiness of the borrower is likely to be in doubt
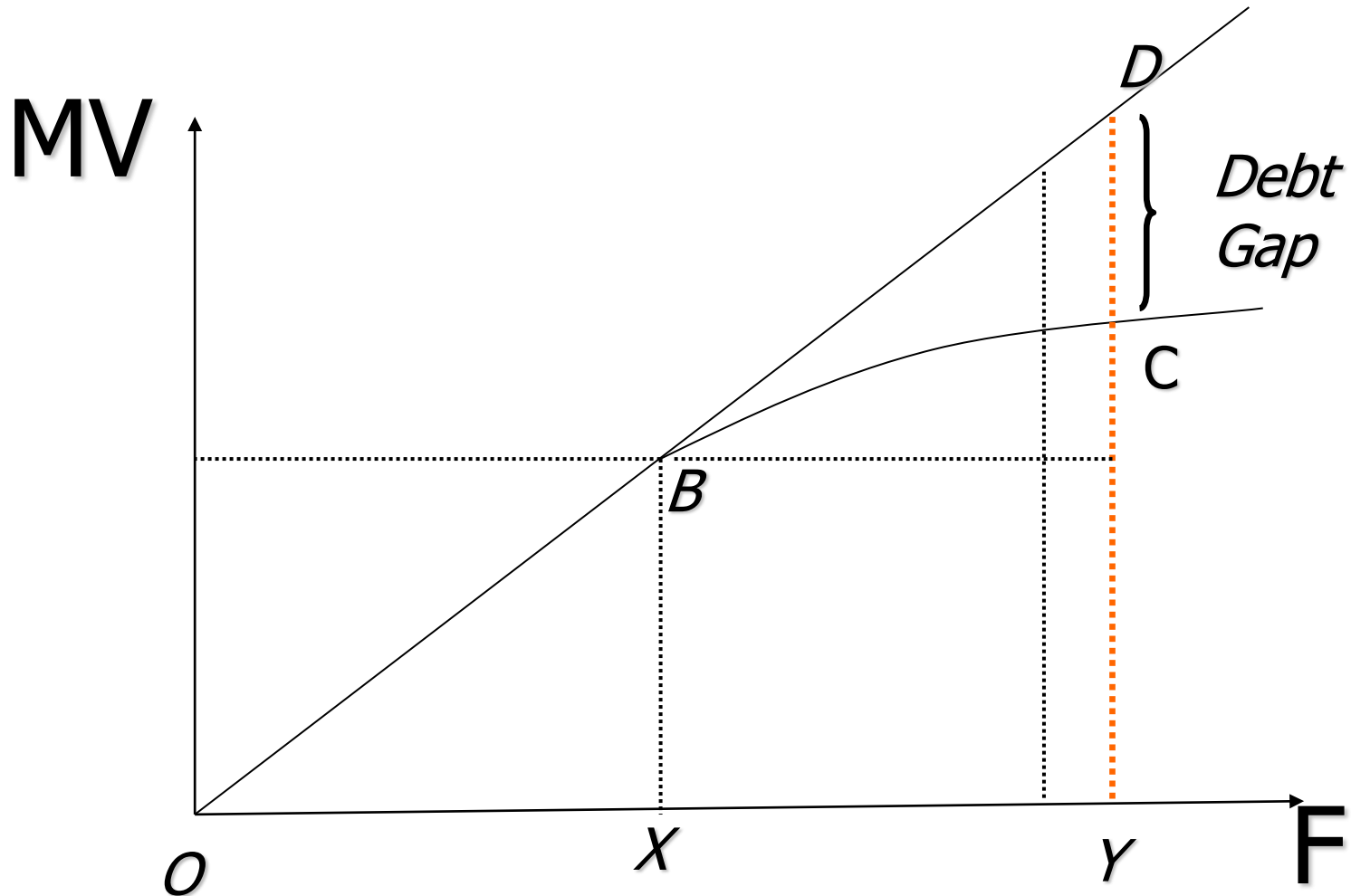- The gap F-MV creates ADDITIONAL Problems to high debt itself

Continued

- via Debt Overhang. The Market Value of Debt (V) = the Present Value of Future EXPECTED Debt Service. If V arises from a PARTIAL service of a larger debt (I.e. Face Value>Market value) then the ACTUAL level of Future Debt service is uncertain. IF the Economy does well it is HIGHER than if the economy does badly. This acts as a disincentive for Debtor countries to achieve strong/improved performance. The effect is equivalent to a large TAX on good performance as this pays of creditors more rapidly.(F-MV)

- In addition, there is a crowding-out effect in the Current Period. Greater outlays on debt service mean lower outlays on other Govt. goods and services. This is more easily resolved via more concessional lending in the current period. (F)

References P-R Agenor and P. Montiel, *Development Macroeconomics*, Ch.15

D. Rodrik in *Journal of Development Economics* (JDE)1991

S. Claessens, World Bank Policy Research Paper, No 1147, 1993.

The Free Rider Problem

Topic 4:
Simple Model of Debt Relief

Source: W. Easterly "How Did Highly Indebted Poor Countries Become Highly Indebted?" World Bank 1999, Web Site For a Partial Counter see Tony Addison, paper to 2001 WIDER Conference on Debt. www.wider.unu.edu

GDP = rA

GNP = rA - rL

Net Worth (Country) = A – L = W

So Debt (L) = A – W

And

$$\overset{*}{L} = \overset{*}{A} - \overset{*}{W} \quad \text{in} \quad \text{Flow terms}$$

Individual Maximise Utility from Consumption over an Infinite Horizon

$$Max \int_{0}^{\infty} \frac{e^{-\rho t} C^{1-\sigma}}{1-\sigma}.dt \quad \text{where} \quad \rho = \text{the discount rate}$$

σ= inter-temporal elasticity of substitution (present for future consumption)

Continued….

Maximisation is subject to:

$$C = rW - (\dot{A} - \dot{L}) \qquad [4]$$

The optimum long term consumption is where:

$$\frac{\dot{C}}{C} = \frac{r - \rho}{\sigma} \qquad [5]$$

Note that the long term growth rate of C is harmed by (i) a high discount rate(ρ) and (ii) a low rate of inter-temporal substitution (1/σ)

Continued

Using [4] and [5] we can solve for the optimum ratio of the country's wealth (W) to its consumption (C)

$$\frac{A-L}{C} = \frac{1}{r[1 - \frac{1}{\sigma}] + \frac{\rho}{\sigma}} \qquad [7]$$

Note (important) that the optimum is defined in relation to A-L and NOT in relation to L alone

Debt Relief

This reduces "L" but does not change the parameters that fix the OPTIMAL value of A-L/C

So for GIVEN values of ρ, σ and r, the country/government responses will be to borrow again to restore the optimal that is temporarily disturbed by a lower stock of debt. This is good in the sense the while the debt is rebuilt, the country can live just a bit better. BUT is does not mean that the country's tendencies to incur debt will go away.

To solve the debt problem more fundamentally it is essential the the terms and conditions of the debt relief somehow force/require a change in (say) ρ

Hence the conditions placed on HIPC countries

Figure 1: External Debt/GDP (present value terms) and per capita income in Highly Indebted Poor Countries

MEASURE OF "L"

PROXY FOR "A"

PROBLEM LOOKS LIKE ONE OF
DECLINING PRODUCTIVE POTENTIAL (CONSISTENT
WITH HIGH P) AND NOT ONLY INCREASED BORROWING,

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95% Confidence Interval for median
Current Account Balance/GDP in HIPCs

EXTERNAL

Budget deficits excluding grants,
confidence interval for median for HIPC

FISCAL

NO CLEAR
IMPROVEMENT

Budget deficits including grants, confidence
interval for median for HIPCs

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Topic 5

The HIPC Initiative

Chart 2
THE HEAVILY INDEBTED POOR COUNTRIES (HIPC) DEBT INITIATIVE
Summary

First Stage

- Paris Club provides flow rescheduling as per current Naples terms, i.e. rescheduling of debt service on eligible debt falling due during the three-year consolidation period (up to 67 percent reduction on eligible maturities on a net present value basis).

- Other bilateral and commercial creditors provide at least comparable treatment.

- Multilateral institutions continue to provide adjustment support in the framework of a World Bank/IMF-supported adjustment program.

- Country establishes first three-year track record of good performance.

Decision Point

Exit

- Either ... Paris Club stock-of-debt operation under Naples terms (up to 67 percent present value reduction of eligible debt) and comparable treatment by other bilateral and commercial creditors is adequate for the country to reach sustainability by the completion point -- country not eligible for HIPC Debt Initiative.

Eligible

- Or ... Paris Club stock-of-debt operation (on Naples terms) not sufficient for the country's overall debt to become sustainable by the completion point -- country requests additional support under the HIPC Debt Initiative, and World Bank/IMF Boards determine eligibility.

Second Stage

- Paris Club goes beyond Naples terms to provide more concessional debt reduction of up to 80 percent in present value terms.
- Other bilateral and commercial creditors provide at least comparable treatment.
- Donors and multilateral institutions provide enhanced support through interim measures.
- Country establishes a second track record of good performance under Bank/IMF- supported programs.

Completion Point

- Paris Club provides deeper stock-of-debt reduction of up to 80 percent in present value terms on eligible debt, so as to achieve an exit from unsustainable debt.

- Other bilateral and commercial creditors provide at least comparable treatment on stock-of-debt.

- Multilateral institutions take such additional measures, as may be needed, for the country's debt to be reduced to a sustainable level, each choosing from a menu of options, and ensuring broad and equitable participation by all creditors involved.

Borderline

- Or ... for borderline cases, where there is doubt about whether sustainability would be achieved by the completion point under a Naples terms stock-of-debt operation, the country would receive further flow reschedulings under Naples terms.

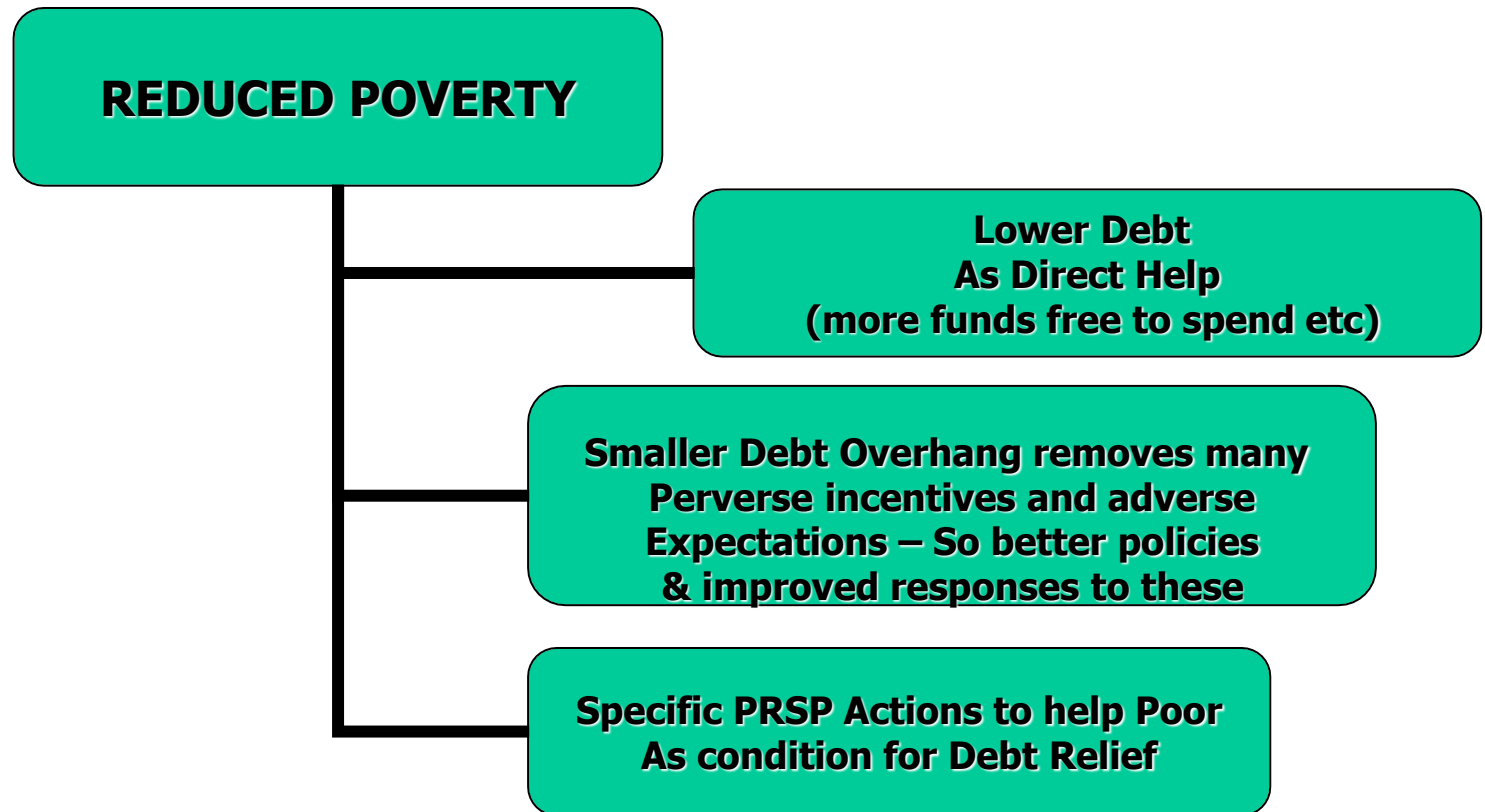If the outcome at the completion point is better than or as projected, the country would receive a stock-of-debt operation on Naples terms from Paris Club creditors and comparable treatment from other bilateral and commercial creditors.

If the outcome at the completion point is worse than projected, the country could receive additional support under the HIPC Debt Initiative, so as to achieve exit from unsustainable debt.

Principles

1. Reduce Debt Levels to those that can be SUSTAINABLY Financed – Rule of thumb is Debt(NPV)/XGS<150%
2. Funds released by Debt Relief committed against clear Poverty Reduction agenda as defined in Poverty Reduction Strategy Paper (PRSP). These are informed by the improvements needed to meet the Millennium Development Goals by 2015.
3. Monitoring of Macroeconomic Performance determines whether country has achieved conditions for HIPC eligibility (see Chart from Boote and Thugg)
4. Also at each stage if rule of thumb met using conventional debt reduction methods (e.g. Paris Club) then country does not need additional HIPC relief

The Logic of HIPC and Gleneagles

REDUCED POVERTY

**Lower Debt
As Direct Help
(more funds free to spend etc)**

**Smaller Debt Overhang removes many
Perverse incentives and adverse
Expectations – So better policies
& improved responses to these**

**Specific PRSP Actions to help Poor
As condition for Debt Relief**

Two Further Angles on the Debt Problem

1.Where do high discount rates come from and why are HIPCS so badly affected?

(research from Addison and Rahman www.wider.unu.edu 2001)

2.How does Corporate Debt get involved in crises and how does this impact the Fiscal Situation?

(research by Michael Pomerleano, *World Bank Policy Research Paper* No 1990, 1998

High Discount Rates-Competing Explanations

- Bad policies (governments force their own high DRs on the rest of society via high taxation, large hidden taxes (structural distortions)

OR

- Rules governing competition between different social groups (ethnic, geographical, political) lead to opportunistic behaviour patterns that negatively impact investment decisions and shorten time horizons

The Addison-Rahman Explanation

- All societies have differentiated social groups but stable societies have invested heavily in rules and institutions that ensure fair competition over resources (jobs, markets) as well as political freedoms

- In all HIPCs these rules are embryonic and legal rules are either absent or very difficult to enforce (e.g. rights to pledge land) – allowing room for tribal rivalries, and sustained economic fragmentation linked in many case to "ethnic capital"

- In 11 of the 41 HIPCS this situation is manifest in outright civil war

- State agents (central and local) look to their own ethnic capital to achieve results (for themselves or the system) and reduce investments in building the stable institutions of other societies

- Ethnic diversity is NOT the problem (I.e. no reduction in growth from this variable in full democracies but up to 3% per annum in dictatorships) –Collier (2001)

The Model

$$NPV_i = \frac{\Sigma(Q_i(P_i - \sigma_i) - C_i}{(1+r)^t}$$

Where Q is the output of an investment (i), P is the price of that output, and C is its costs of production. σ is the dilution of the price of the output caused by the extra transaction costs associated with poor enforcement of contracts and

unregulated social competition more generally

All three effects reduce aggregate investment but some (especially "r") impact differentially on investment in tradeables as compared to non-tradeables. Why? Longer term horizon needed for former (cocoa, coffee tea etc) than former (subsistence foods and services).

The effects spread contagion across all actors (private, community, state) –see Figure

Estimation

Probit models were used to assess probability of becoming a HIPC as explained by (a) the impacts of Bad Policy versus (b) inadequate frameworks for Social Competition over Resources

Results show:

• the importance of the social mal-function

• the loss of statistical significance of some conventional macro indicators when social malfunction variables are

included

Corporate Debt and the Asian Crisis

Look at Michael Pomerleano. *The East Asia Crisis and Corporate Finances: The Untold Micro Story*, World Bank Policy Research Working Paper, No. 1990, 1998

Corporate Characteristics in Asia - pre Crisis

	Leverage 1992-96 (Average	Debt Raised (% of Investment) 1992-96 Average	Altman's Fragility Index 1995/96	ROCE-Lending Rate 1995/96
Crisis Countries				
Indonesia	92%	67%	2.6	-9%
Korea	132%	69%	1.55	-2%
Thailand	155%	78%	1.5	-8%
Malaysia	62%	45%	3.9	3%
Philippines	69%	25%	3.4	-9%
Comparator Countries				
Hong Kong	39%	45%	6.9	12%
Latin America	31%	19%	1.9	na
Germany	58%	6%	na	-8%
USA	90%	8%	na	4%

A Typical Asian Corporation

Table 4: Interest Rate Impacts on a Typical Company								
Combined Operating and P&L Account								
	Year 1	**Year 2 (A)**	**Year 2 (B)**	**Year 2(C)**		**Year 1**	**Year 2 (A)**	**Year 2 (B)**	**Year 2 (C)**
Costs					Revenues				
Wages	150	165	165	165	Sales	490	539	539	539
Materials	50	55	55	55					
Interest Charges	80	88	176	220					
Depreciation	130	143	143	143					
Balance-Profit	80	88	0	-44					
Totals	490	539	539	539	Totals	490	539	539	539
Balance-Sheet									
	Year 1	**Year 2 (A)**	**Year 2 (B)**	**Year 2(C)**		**Year 1**	**Year 2 (A)**	**Year 2 (B)**	**Year 2 (C)**
Fixed Assets	1300	1287	1287	1287	Loans	800	880	880	880
Cash	80	231	143	99	Shareholder Funds	500	500	500	500
					Revaluations	0	50	50	50
					Retained Profits	80	88	0	-44
Totals	1380	1518	1430	1386	Totals	1380	1518	1430	1386
ROC						**5.80%**	**6.38%**	**0.00%**	**-3.19%**
Revaluation Profit									
Fixed Assets		130							
Loans		-80							

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