

“A study of regional trends in external debt in developing economies”

AUTHORS

Mihir Dash

ARTICLE INFO

Mihir Dash (2016). A study of regional trends in external debt in developing economies. *Investment Management and Financial Innovations*, 13(3), 22-34. doi:[10.21511/imfi.13\(3\).2016.02](https://doi.org/10.21511/imfi.13(3).2016.02)

DOI

[http://dx.doi.org/10.21511/imfi.13\(3\).2016.02](http://dx.doi.org/10.21511/imfi.13(3).2016.02)

RELEASED ON

Tuesday, 23 August 2016

JOURNAL

"Investment Management and Financial Innovations"

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

0



NUMBER OF FIGURES

0



NUMBER OF TABLES

0

© The author(s) 2026. This publication is an open access article.

Mihir Dash (India)

A study of regional trends in external debt in developing economies

Abstract

This study examines the trends in external debt in developing countries across different regions. The variables considered were gross external debt, public and public guaranteed external debt, short-term external debt, and variable rate external debt. The data were collected from the joint BIS-IMF-OECD-World Bank statistics on external debt, pertaining to the period 1995-2014.

The results of the study highlight significant regional imbalances in external debt, which may contribute to the risk of sovereign-debt default. East Asia & Pacific region had high level of gross external debt and high percentage of short-term external debt. Europe & Central Asia region had high level of gross external debt, high gross external debt growth rate, high percentage of variable rate external debt, high ratio of short-term external debt relative to GDP, and high ratio of variable rate external debt relative to GDP; perhaps reflecting the ongoing European Sovereign Debt Crisis. Latin America & Caribbean region had high level of gross external debt and high percentage of variable rate external debt. Middle East & North Africa region had high percentage of public and public guaranteed external debt. South Asia had high gross external debt growth rate, high public and public guaranteed external debt growth rate, high short-term external debt growth rate, and high variable rate external debt growth rate in the post-crisis period. Sub-Saharan Africa region had high percentage of public and public guaranteed external debt and high variable rate external debt growth rate in the post-crisis period. Thus, each of the regions had specific types of risk. The individual developing economies in the regions need to be examined carefully to isolate their contribution to regional sovereign-debt default risk.

Keywords: gross external debt, public and public guaranteed external debt, short-term external debt, variable rate external debt.

JEL Classification: H63.

Introduction

The risk of sovereign default is not a new phenomenon. In the 1970s, when the oil prices rose steeply and inflation was in double-digits, the Lesser Developed Countries (LDCs) experienced difficulties in fulfilling their external debt obligations. This led to the Debt Trap of the Latin American economies in the late 1970s, particularly Argentina and Brazil, which, in turn, led to a chain of defaults. In 1982, the Mexican government declared a freeze on its interest payments and the multinational banks (both US and European) were left with a large number of non-performing assets. This crisis led to a new opportunity, the US and European banks started swapping their non-performing loans which got established as a systematic market. The outcome of this was the Brady Plan where bonds were issued by the less developed countries as tradable securities backed by specific assets and cash flows. Banks were, thus, able to convert their outstanding LDC loans into Brady bonds, which were tradable instruments.

In the 1990s, the world economy experienced a major shift. The liberalized markets in China, India and Southeast Asia were rapidly evolving into high-growth, affluent economies. Portfolio capital flowed away from the developed countries into these rapidly evolving economies which were renamed as the emerging economies.

However, the market growth outpaced the implementation of a sound legal and economic infrastructure. Financial fragility and weak banking systems made these countries susceptible to external shocks. In 1997, the Thai Baht depreciated by more than half; the Korean Won followed with a 70% plunge. The swinging currencies and market uncertainties led to huge capital flight which, in turn, led to a plunge in the stock market and local bonds. This was not limited to Asia. The ripples of this crisis were felt across Eastern Europe and Latin America, as investors started bailing out their assets/holdings from the emerging markets. There was massive global financial meltdown. The Asian crises, in stark contrast to those of Latin America in the early 1980s, were the result of private and investment-related problems, instead of public and consumption-related difficulties.

After the crises of the 1980s and 1990s, the Greek crisis began in the 2000's. Greece has been going through a financial meltdown for years. In 2001, Greece was given a chance to join the Eurozone and enjoy similar legitimacy in global markets as countries like Germany. To do so, Greece falsified its government expenditure data. Once it was able to join the Eurozone, the country started overspending.

Greece became the epicenter of Europe's debt crisis after the Global Financial Crisis in 2008. With global financial markets in turmoil, Greece announced in October 2009 that it had been understating its deficit figures for years, raising alarms about the soundness of Greek finances. Suddenly, Greece was shut out from borrowing in

© Mihir Dash, 2016.

Mihir Dash, Professor, Head of Department, Department of Economics & Quantitative Methods, School of Business, Alliance University, Bangalore, India.

the financial markets. By the spring of 2010, it was veering toward bankruptcy, and had set off a new financial crisis.

The ongoing European Sovereign-Debt Crisis has brought to the forefront the dangers of high levels of sovereign debt. The Greek case is, indeed, peculiar, with serious under-reporting and deliberate falsification of economic data on the part of the Greek government. However, this may actually just be the tip of the iceberg. Several economies have experienced increased debt exposure with the global financial crisis of 2008, and the 'PIGS' (Portugal/Ireland/Greece/Spain) may not be the only economies in distress.

Methodology

The objective of the study was to assess the trends in gross external debt of developing economies region-wise. The regions were taken as per the World Bank¹ definitions, viz. East Asia & Pacific, Europe & Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia, and Sub-Saharan Africa. The study period selected was 1995-2014. The data for the study were collected from the joint BIS-IMF-OECD-World Bank statistics on external debt².

The variables considered were gross external debt, public and public guaranteed (PPG) external debt, short-term (ST) external debt, and variable rate (VR) external debt. According to the International Monetary Fund (IMF), "gross external debt is the amount, at any

given time, of disbursed and outstanding contractual liabilities of residents of a country to nonresidents to repay principal, with or without interest, or to pay interest, with or without principal". The percentage of public and public guaranteed external debt represents the exposure of the economy to sovereign-debt default risk. The percentage of short-term external debt represents the exposure of the economy to liquidity risk. The percentage of variable rate external debt represents the exposure of the economy to interest rate risk. The sustainability of external debt and its components was examined by considering the ratios of the variables to the gross domestic product (GDP).

The trends in the variables were examined through time series methods. Growth rates were calculated by regressing the logarithms of the focus variables on the year variable, and including a dummy for post-crisis years in order to test for difference in growth rates pre- and post-crisis. The determinants of external debt and its components were examined using fixed-effects panel regression, with regions as the fixed factors, and GDP and net FDI inflows as the covariates.

Analysis

The region-wise break-up of the gross external debt and the percentage of public and public guaranteed, short-term, and variable rate external debt in developing economies are presented in Tables 1-4 and Figures 1-4 below.

Table 1. Trends in total gross external debt region-wise^{1 2}

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	455.49	124.00	448.07	161.50	150.92	234.11
1996	493.97	133.73	456.32	157.19	150.02	228.64
1997	526.31	147.53	465.22	145.19	149.28	223.33
1998	533.25	166.97	529.35	153.38	158.28	226.44
1999	536.27	179.24	543.26	148.68	163.86	214.69
2000	497.36	203.29	524.44	143.66	162.42	212.09
2001	514.39	212.11	528.58	140.72	158.74	202.49
2002	514.11	239.41	525.38	151.03	170.35	221.22
2003	545.23	273.68	543.71	161.33	189.00	241.51
2004	597.65	316.95	544.17	171.62	196.20	256.31
2005	641.53	357.89	517.45	150.58	189.90	233.42
2006	683.82	477.69	529.59	144.69	234.32	197.17
2007	768.50	641.32	613.84	156.28	288.90	224.71
2008	815.55	743.98	650.34	148.71	323.36	226.71
2009	938.73	777.72	677.24	160.64	364.81	255.72
2010	1105.66	837.07	827.24	167.92	411.31	281.61
2011	1314.80	873.85	948.46	165.68	463.93	311.87
2012	1514.40	926.40	1068.67	172.51	530.22	352.00
2013	1684.47	1030.61	1204.57	188.94	572.59	374.96
2014	1816.59	1023.99	1346.82	187.88	613.38	402.81

Note: F Stat = 48.1214, p = 0.0000 for difference between regions, controlling for years.

¹ <http://data.worldbank.org/>.

² http://www.bis.org/publ/r_debt.htm?m=6%7C34.

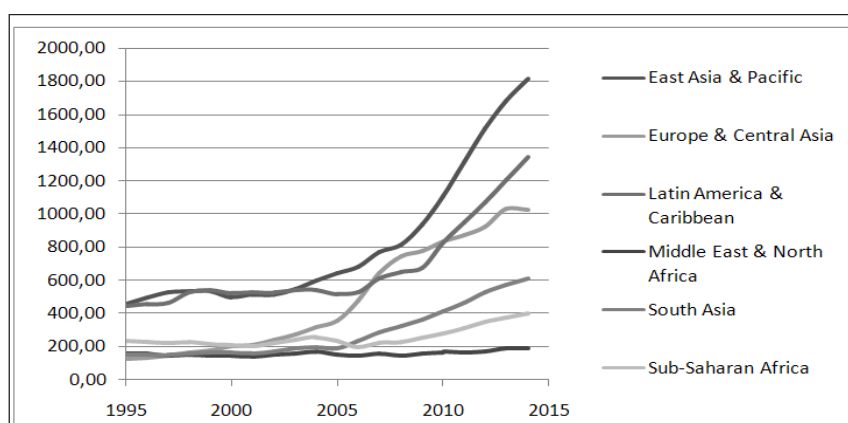


Fig. 1. Trends in total gross external debt region-wise

The gross external debt of developing economies in the East Asia & Pacific region has consistently been the highest among the regions, and has trebled in the last ten years; that of Latin America & Caribbean

developing economies ranks second highest, and has doubled in the last five years. Another disturbing trend is that of Europe & Central Asia, for which the gross external debt has also trebled in the last ten years.

Table 2. Trends in PPG external debt as a percentage of total gross external debt region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	56.07%	70.18%	62.12%	86.72%	84.99%	74.64%
1996	51.76%	64.38%	60.13%	85.80%	84.26%	74.43%
1997	50.38%	59.87%	53.97%	84.13%	84.80%	75.44%
1998	51.48%	57.29%	51.66%	82.68%	86.87%	75.30%
1999	53.64%	54.38%	50.15%	80.26%	87.12%	72.77%
2000	54.49%	51.21%	51.50%	78.20%	82.88%	76.03%
2001	51.09%	47.88%	53.82%	79.26%	82.28%	75.87%
2002	51.95%	46.94%	56.50%	80.49%	81.19%	76.91%
2003	49.85%	44.80%	57.76%	80.64%	66.72%	77.53%
2004	46.32%	40.70%	58.44%	78.54%	66.06%	75.33%
2005	43.23%	33.07%	60.68%	76.64%	61.40%	74.54%
2006	41.67%	26.58%	55.84%	74.83%	54.29%	62.44%
2007	38.42%	23.22%	49.79%	74.54%	50.08%	58.23%
2008	38.98%	20.87%	48.60%	74.18%	48.33%	59.28%
2009	36.72%	22.05%	47.56%	70.09%	46.52%	57.70%
2010	30.57%	23.02%	44.28%	67.91%	46.22%	56.19%
2011	25.71%	23.83%	41.04%	67.92%	43.95%	56.49%
2012	26.79%	24.86%	42.36%	70.31%	44.21%	56.79%
2013	24.73%	25.29%	42.57%	72.28%	41.87%	59.31%
2014	23.77%	26.57%	43.72%	70.14%	44.67%	60.68%

Note: F Stat = 106.9737, $p = 0.0000$ for difference between regions, controlling for years.



Fig. 2. Trends in PPG external debt as a percentage of total gross external debt region-wise

There has been a trend decline in the public and public guaranteed external debt as a percentage of total gross external debt across all the regions. The percentage of public and public guaranteed external debt is highest for Middle East & North Africa region, followed by

the Sub-Saharan Africa region, suggesting the possibility of sovereign debt risk. On the other hand, the percentage of public and public guaranteed external debt has declined by more than two-and-a-half times in the Europe & Central Asia region.

Table 3. Trends in ST external debt as a percentage of total gross external debt region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	23.88%	16.93%	20.92%	11.38%	6.00%	17.29%
1996	26.05%	17.78%	18.82%	11.73%	6.87%	18.24%
1997	25.08%	19.18%	17.97%	12.41%	5.50%	18.18%
1998	15.83%	18.34%	14.77%	13.78%	4.49%	18.58%
1999	13.57%	18.18%	13.07%	14.42%	4.29%	18.79%
2000	12.35%	19.64%	12.57%	16.63%	3.73%	14.81%
2001	20.20%	17.40%	11.24%	15.33%	3.32%	14.12%
2002	21.58%	15.10%	12.37%	14.16%	4.26%	12.29%
2003	24.95%	17.11%	11.89%	14.03%	4.79%	11.88%
2004	28.34%	19.17%	11.89%	16.60%	5.06%	13.31%
2005	31.00%	22.43%	12.66%	17.81%	6.12%	14.44%
2006	32.76%	22.39%	12.57%	19.52%	12.16%	21.45%
2007	36.06%	21.65%	15.03%	20.19%	14.30%	21.27%
2008	34.31%	19.73%	13.55%	19.94%	15.50%	21.39%
2009	37.58%	17.03%	12.54%	20.43%	14.75%	16.58%
2010	45.43%	20.15%	16.35%	22.50%	16.18%	15.41%
2011	49.58%	20.67%	13.29%	22.29%	19.04%	13.35%
2012	48.50%	21.45%	13.20%	19.41%	20.02%	14.20%
2013	51.40%	22.48%	13.12%	17.48%	19.08%	14.03%
2014	50.97%	21.05%	13.63%	19.35%	16.86%	14.64%

Note: F Stat = 37.2136, p = 0.0000 for difference between regions, controlling for years.

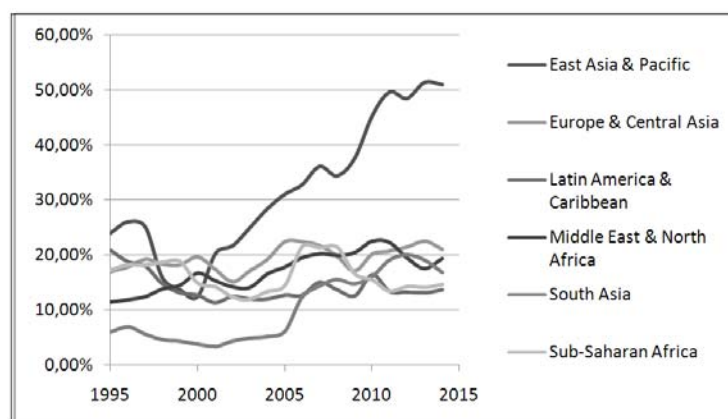


Fig. 3. Trends in ST external debt as a percentage of total gross external debt region-wise

The short-term external debt as a percentage of total gross external debt has been relatively stable between 10% and 20% across the regions, except for East Asia & Pacific region. The percentage of short-term external debt for East Asia & Pacific region has increased five-fold over the last fifteen

years, crossing 50% in recent years, suggesting a higher possibility of liquidity risk at a regional level. On the other hand, the Latin America & Caribbean and Sub-Saharan Africa regions have the least percentage of short-term external debt in recent years.

Table 4. Trends in VR external debt as a percentage of total gross external debt region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	34.09%	37.82%	44.05%	28.21%	18.14%	15.69%
1996	35.26%	39.01%	47.38%	26.84%	20.09%	14.76%
1997	38.92%	41.11%	50.32%	26.42%	22.91%	13.82%
1998	46.42%	42.82%	53.85%	24.47%	22.42%	12.89%

Table 4 (cont.). Trends in VR external debt as a percentage of total gross external debt region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1999	44.70%	39.74%	55.78%	23.32%	21.22%	13.38%
2000	45.98%	40.98%	54.80%	21.83%	26.75%	13.36%
2001	42.07%	41.37%	54.65%	22.16%	26.10%	13.58%
2002	39.71%	40.98%	49.54%	21.89%	23.47%	16.07%
2003	36.68%	40.14%	48.35%	22.29%	36.94%	17.04%
2004	35.17%	43.25%	48.66%	21.62%	37.18%	17.83%
2005	34.53%	48.58%	51.69%	23.44%	41.08%	19.61%
2006	34.45%	55.37%	55.29%	20.38%	41.91%	25.38%
2007	33.27%	60.28%	58.84%	20.35%	45.14%	29.54%
2008	34.55%	63.47%	62.41%	19.01%	45.39%	28.96%
2009	30.85%	62.19%	57.36%	17.61%	46.43%	28.62%
2010	29.35%	57.68%	57.86%	17.12%	47.30%	31.10%
2011	29.64%	56.98%	62.98%	17.88%	46.93%	34.15%
2012	29.49%	56.34%	62.73%	20.58%	46.56%	33.53%
2013	28.74%	56.69%	62.37%	21.81%	49.66%	33.31%
2014	30.25%	57.86%	61.16%	21.55%	53.87%	33.22%

Note: F Stat = 74.1795, $p = 0.0000$ for difference between regions, controlling for years.

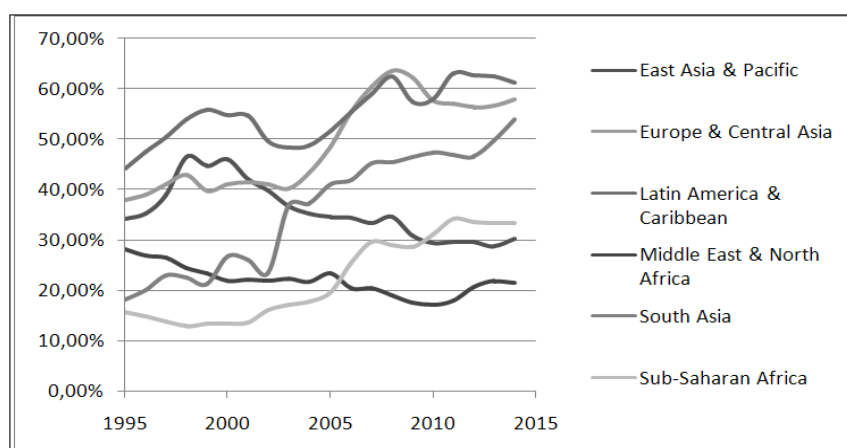


Fig. 4. Trends in VR external debt as a percentage of total gross external debt region-wise

The variable-rate external debt as a percentage of total gross external debt has shown very diverse trends across the regions. The percentage of variable rate external debt for Latin America & Caribbean region has been consistently highest among the regions, followed by that for the Europe & Central Asia region, reaching close to 60% in recent years, suggesting the possibility of interest rate risk. Also, the percentage of variable rate external debt for South

Asia has increased by two-and-a-half times over the last fifteen years, crossing 50% in recent years, again suggesting the possibility of interest rate risk. On the other hand, the Middle East & North Africa region has consistently had the least percentage of variable rate external debt, at around 20%. The growth of external debt seems to have accelerated particularly in the post-crisis period. The growth rates are presented in Table 5 below.

Table 5. Growth rates of total gross external debt, PPG external debt, ST external debt, and VR external debt region-wise

		East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
Ext Debt TTL	Entire period	4.80%	12.28%	3.26%	0.54%	5.45%	1.22%
	Post-crisis period	48.96%	31.49%	34.17%	6.02%	59.19%	23.87%
	P-value	0.0086	0.1327	0.0393	0.3523	0.0003	0.0830
Ext Debt PPG	Entire period	1.42%	5.11%	2.74%	-0.48%	1.25%	0.20%
	Post-crisis period	18.91%	24.04%	12.08%	2.12%	40.42%	8.26%
	P-value	0.0091	0.0170	0.3932	0.7144	0.0050	0.5906
Ext Debt ST	Entire period	9.85%	14.34%	0.18%	4.06%	10.69%	0.01%
	Post-crisis period	91.71%	20.90%	71.28%	4.43%	214.20%	31.78%

Table 5 (cont.). Growth rates of total gross external debt, PPG external debt, ST external debt, and VR external debt region-wise

		East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
	P-value	0.0500	0.6943	0.0079	0.9580	0.0059	0.0707
Ext Debt VR	Entire period	3.49%	14.87%	4.31%	-1.02%	13.05%	6.33%
	Post-crisis period	32.30%	44.42%	44.64%	1.43%	45.00%	52.35%
	P-value	0.0709	0.2005	0.0270	0.8384	0.0323	0.0247

The growth rates of external debt and its components were higher in the post-crisis period, and statistically significantly higher for the South Asia, East Asia & Pacific, and Latin America & Caribbean regions. Europe & Central Asia has had the highest overall rate of growth of gross external debt, as well as the highest overall growth rate of PPG external debt, ST external debt, and VR external debt. However, in the post-crisis period, South Asia has experienced the highest growth rate of gross external debt, followed by East Asia & Pacific. Similarly, in the post-crisis period, South Asia has experienced the

highest growth rate of PPG external debt and ST external debt, followed by East Asia & Pacific. On the other hand, in the post-crisis period, Sub-Saharan Africa has had the highest growth rate of VR external debt, followed by South Asia, Latin America & Caribbean, and Europe & Central Asia.

The region-wise ratio of the total gross external debt, public and public guaranteed external debt, short-term external debt, and variable rate external debt to gross domestic product (GDP) in developing economies are presented in Tables 6-9 and Figures 5-8 below.

Table 6. Trends in total gross external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	34.68%	34.82%	31.45%	47.74%	31.11%	70.37%
1996	32.74%	36.15%	29.32%	40.04%	28.27%	66.46%
1997	33.69%	37.81%	27.42%	36.01%	26.81%	62.81%
1998	37.26%	35.60%	31.19%	37.46%	28.03%	67.51%
1999	34.07%	42.15%	36.50%	34.34%	27.08%	63.66%
2000	28.68%	47.04%	31.39%	32.01%	25.81%	58.71%
2001	27.85%	55.39%	32.60%	30.29%	24.58%	60.34%
2002	25.15%	54.10%	32.82%	33.50%	25.06%	61.26%
2003	23.60%	48.55%	33.38%	31.74%	23.83%	52.28%
2004	22.31%	43.88%	29.51%	29.48%	21.33%	44.74%
2005	20.72%	39.84%	23.16%	21.92%	18.02%	34.60%
2006	18.36%	45.42%	20.28%	18.13%	19.45%	25.00%
2007	16.32%	47.90%	19.94%	15.77%	18.93%	24.72%
2008	13.70%	46.35%	18.40%	12.13%	20.83%	21.96%
2009	14.56%	58.10%	20.62%	13.61%	21.37%	25.96%
2010	14.15%	54.78%	20.15%	12.35%	19.64%	21.29%
2011	13.77%	51.04%	19.96%	10.54%	20.31%	20.90%
2012	14.22%	52.91%	22.96%	10.21%	23.03%	22.51%
2013	14.36%	54.83%	25.30%	11.52%	24.25%	22.73%
2014	14.41%	56.35%	28.21%	12.19%	23.69%	23.29%

Note: F Stat = 29.5263, p = 0.0000 for difference between regions, controlling for years.

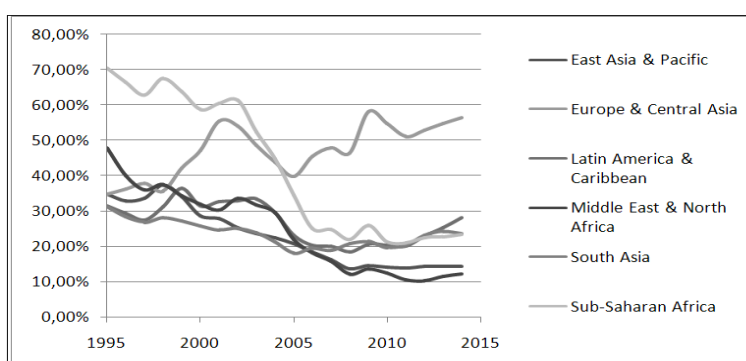


Fig. 5. Trends in total gross external debt to GDP region-wise

The ratio of gross external debt to GDP has generally decreased across the regions, except for Europe & Central Asia region. The gross external debt-GDP ratio for Europe & Central Asia region has been consistently above the 50% level in

recent years, suggesting the possibility of sovereign-debt risk. On the other hand, the Middle East & North Africa and South Asia regions have the lowest ratio of gross external debt to GDP in recent years.

Table 7. Trends in PPG external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	19.44%	24.44%	19.54%	41.40%	26.44%	52.53%
1996	16.94%	23.28%	17.63%	34.35%	23.82%	49.47%
1997	16.97%	22.64%	14.80%	30.29%	22.73%	47.38%
1998	19.18%	20.39%	16.12%	30.98%	24.35%	50.84%
1999	18.28%	22.92%	18.30%	27.56%	23.59%	46.32%
2000	15.63%	24.09%	16.17%	25.03%	21.39%	44.64%
2001	14.23%	26.52%	17.54%	24.01%	20.22%	45.78%
2002	13.06%	25.39%	18.54%	26.97%	20.35%	47.12%
2003	11.77%	21.75%	19.28%	25.59%	15.90%	40.53%
2004	10.33%	17.86%	17.25%	23.16%	14.09%	33.70%
2005	8.95%	13.17%	14.05%	16.80%	11.06%	25.79%
2006	7.65%	12.07%	11.32%	13.56%	10.56%	15.61%
2007	6.27%	11.12%	9.93%	11.75%	9.48%	14.39%
2008	5.34%	9.67%	8.94%	9.00%	10.06%	13.02%
2009	5.34%	12.81%	9.81%	9.54%	9.94%	14.98%
2010	4.32%	12.61%	8.92%	8.39%	9.08%	11.96%
2011	3.54%	12.16%	8.19%	7.16%	8.92%	11.81%
2012	3.81%	13.15%	9.72%	7.18%	10.18%	12.79%
2013	3.55%	13.87%	10.77%	8.33%	10.15%	13.48%
2014	3.42%	14.97%	12.33%	8.55%	10.58%	14.14%

Note: F Stat = 36.1656, p = 0.0000 for difference between regions, controlling for years.

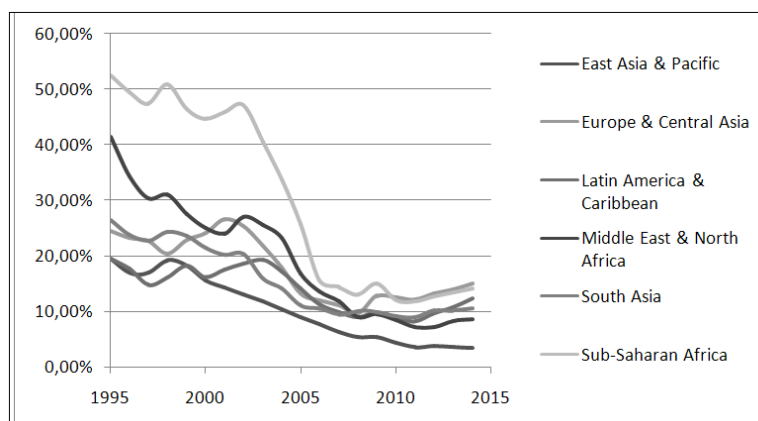


Fig. 6. Trends in PPG external debt to GDP region-wise

The ratio of public and public guaranteed external debt to GDP has consistently decreased across all of the regions, suggesting that the risk of sovereign-debt default has decreased overall at a regional level. The PPG external debt-GDP ratio for Sub-Saharan Africa

region has decreased from the 50% level to about 15% in recent years. South Asia has consistently had the least PPG external debt-GDP ratio, reaching below 5% in recent years, possibly indicating the least risk of sovereign-debt default at a regional level.

Table 8. Trends in ST external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	8.28%	5.90%	6.58%	5.43%	1.87%	12.17%
1996	8.53%	6.43%	5.52%	4.70%	1.94%	12.13%
1997	8.45%	7.25%	4.93%	4.47%	1.48%	11.42%
1998	5.90%	6.53%	4.61%	5.16%	1.26%	12.54%
1999	4.62%	7.66%	4.77%	4.95%	1.16%	11.96%

Table 8 (cont.). Trends in ST external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
2000	3.54%	9.24%	3.94%	5.32%	0.96%	8.69%
2001	5.63%	9.64%	3.66%	4.64%	0.82%	8.52%
2002	5.43%	8.17%	4.06%	4.74%	1.07%	7.53%
2003	5.89%	8.31%	3.97%	4.45%	1.14%	6.21%
2004	6.32%	8.41%	3.51%	4.89%	1.08%	5.95%
2005	6.42%	8.94%	2.93%	3.90%	1.10%	4.99%
2006	6.01%	10.17%	2.55%	3.54%	2.37%	5.36%
2007	5.88%	10.37%	3.00%	3.18%	2.71%	5.26%
2008	4.70%	9.14%	2.49%	2.42%	3.23%	4.70%
2009	5.47%	9.90%	2.59%	2.78%	3.15%	4.30%
2010	6.43%	11.04%	3.29%	2.78%	3.18%	3.28%
2011	6.83%	10.55%	2.65%	2.35%	3.87%	2.79%
2012	6.90%	11.35%	3.03%	1.98%	4.61%	3.20%
2013	7.38%	12.33%	3.32%	2.01%	4.63%	3.19%
2014	7.34%	11.86%	3.84%	2.36%	3.99%	3.41%

Note: F Stat = 33.5298, $p = 0.0000$ for difference between regions, controlling for years.

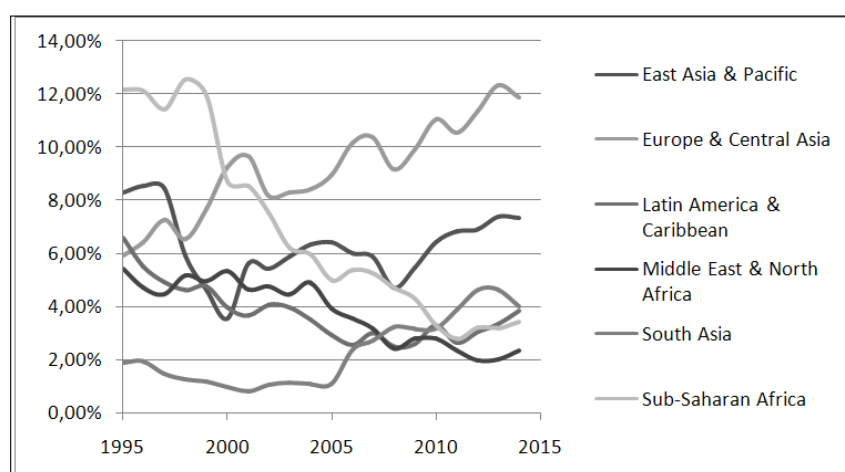


Fig. 7. Trends in ST external debt to GDP region-wise

The short-term external debt-GDP ratio has shown very diverse trends across the regions. Europe & Central Asia has experienced a trend increase in the short-term external debt-GDP ratio, reaching about 12% in recent years, consistently highest among the regions, suggesting a higher possibility of liquidity risk at a regional level. Sub-Saharan Africa has

reduced its short-term external debt-GDP ratio from above 12% to about 3%. South Asia had a consistently low level of short-term external debt-GDP ratio until recent years. Middle East & North Africa has the least short-term external debt-GDP ratio in recent years, suggesting a lower possibility of liquidity risk at a regional level.

Table 9. Trends in VR external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
1995	11.82%	13.17%	13.85%	13.47%	5.64%	11.04%
1996	11.55%	14.10%	13.89%	10.75%	5.68%	9.81%
1997	13.11%	15.54%	13.80%	9.51%	6.14%	8.68%
1998	17.29%	15.24%	16.80%	9.17%	6.28%	8.70%
1999	15.23%	16.75%	20.36%	8.01%	5.75%	8.52%
2000	13.19%	19.28%	17.20%	6.99%	6.90%	7.85%
2001	11.72%	22.92%	17.81%	6.71%	6.41%	8.19%
2002	9.99%	22.17%	16.26%	7.33%	5.88%	9.85%
2003	8.66%	19.49%	16.14%	7.07%	8.80%	8.91%
2004	7.85%	18.97%	14.36%	6.37%	7.93%	7.98%
2005	7.15%	19.36%	11.97%	5.14%	7.40%	6.79%
2006	6.32%	25.15%	11.21%	3.69%	8.15%	6.35%

Table 9 (cont.). Trends in VR external debt to GDP region-wise

Year	East Asia & Pacific	Europe & Central Asia	Latin America & Caribbean	Middle East & North Africa	South Asia	Sub-Saharan Africa
2007	5.43%	28.87%	11.73%	3.21%	8.55%	7.30%
2008	4.73%	29.42%	11.48%	2.31%	9.45%	6.36%
2009	4.49%	36.13%	11.83%	2.40%	9.92%	7.43%
2010	4.15%	31.60%	11.66%	2.12%	9.29%	6.62%
2011	4.08%	29.08%	12.57%	1.89%	9.53%	7.14%
2012	4.19%	29.81%	14.40%	2.10%	10.72%	7.55%
2013	4.13%	31.08%	15.78%	2.51%	12.04%	7.57%
2014	4.36%	32.60%	17.25%	2.63%	12.77%	7.74%

F Stat = 50.2091, p = 0.0000 for difference between regions, controlling for years.

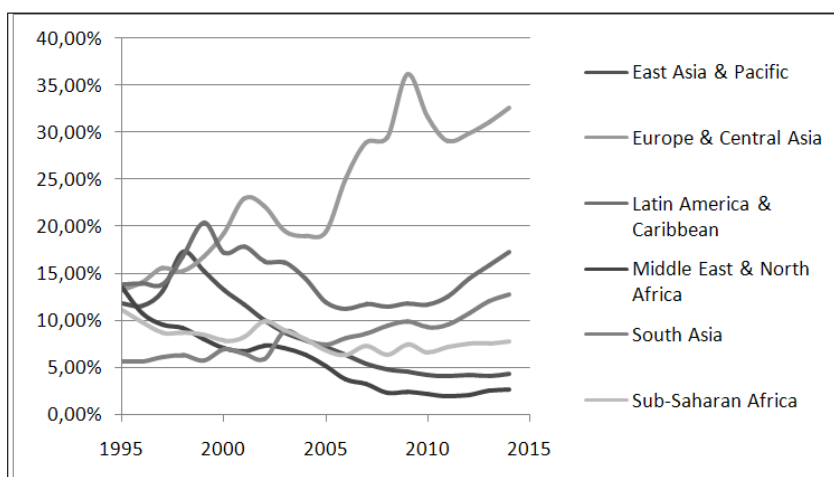


Fig. 8. Trends in VR external debt to GDP region-wise

The variable rate external debt-GDP ratio has been relatively stable between 5% and 15% across the regions, except for Europe & Central Asia region. The variable rate external debt-GDP ratio for Europe & Central Asia has doubled over the last twenty years, crossing 30% in recent years, suggesting a higher possibility of interest rate risk at a regional level. On the other hand, the Middle East & North Africa and

East Asia & Pacific regions have the least variable rate external debt-GDP ratio in recent years, suggesting a lower possibility of interest rate risk at a regional level. The results of the fixed-effects panel regression for logarithm of gross external debt, logarithm of public and public guaranteed external debt, logarithm of short-term external debt, and logarithm of variable rate external debt are presented in Table 10 below.

Table 10. Fixed effects panel regression for total external debt, PPG external debt, ST external debt, and VR external debt

	ln(Ext Debt TTL)		ln(Ext Debt PPG)		ln(Ext Debt ST)		ln(Ext Debt VR)	
Source	F Stat	p-value	F Stat	p-value	F Stat	p-value	F Stat	p-value
Corrected model	91.5290	0.0000	86.1595	0.0000	92.9611	0.0000	97.6572	0.0000
Intercept	0.0126	0.9109	2.0553	0.1545	8.8382	0.0036	1.1011	0.2963
Region	15.8190	0.0000	27.9471	0.0000	22.1149	0.0000	39.5161	0.0000
Post-crisis	1.4056	0.2383	3.5227	0.0632	0.5555	0.4577	0.8071	0.3709
ln(GDP at market prices)	8.0185	0.0055	0.1503	0.6990	24.6835	0.0000	3.3903	0.0683
ln(net FDI inflows)	0.1659	0.6845	4.2387	0.0419	6.3100	0.0135	0.2531	0.6159
Year	0.1506	0.6988	7.3502	0.0078	8.5749	0.0041	1.5819	0.2111
	R ² = 0.882		R ² = 0.876		R ² = 0.884		R ² = 0.889	
	adj R ² = 0.873		adj R ² = 0.866		adj R ² = 0.874		adj R ² = 0.880	
Parameter	coeff.	p-value	coeff.	p-value	coeff.	p-value	coeff.	p-value
Intercept	2.8734	0.9107	-23.8986	0.1547	112.9032	0.0036	-38.8219	0.2919
[East Asia & Pacific]	0.3148	0.2163	0.6759	0.0001	-0.6305	0.0960	0.8550	0.0203
[Europe & Central Asia]	0.3069	0.0004	-0.1983	0.0005	0.2924	0.0217	1.1487	0.0000
[Latin America & Caribbean]	0.3299	0.1090	0.7228	0.0000	-1.0004	0.0013	1.3074	0.0000

Table 10 (cont.). Fixed effects panel regression for total external debt, PPG external debt, ST external debt, and VR external debt

	ln(Ext Debt TTL)		ln(Ext Debt PPG)		ln(Ext Debt ST)		ln(Ext Debt VR)	
[Middle East & North Africa]	-0.4917	0.0000	-0.3765	0.0000	-0.4170	0.0020	-0.4349	0.0009
[South Asia]	-0.2127	0.0618	-0.1316	0.0764	-1.1424	0.0000	0.2939	0.0720
[Sub-Saharan Africa]	0(a)	.	0(a)	.	0(a)	.	0(a)	.
[Pre-Crisis]	-0.1157	0.2383	-0.1196	0.0632	-0.1079	0.4577	-0.1258	0.3709
[Post-Crisis]	0(a)	.	0(a)	.	0(a)	.	0(a)	.
ln(GDP at market prices)	0.4337	0.0055	0.0388	0.6990	1.1289	0.0000	0.4046	0.0683
ln(net FDI inflows)	0.0236	0.6845	-0.0778	0.0419	0.2156	0.0135	0.0418	0.6159
Year	0.0055	0.6988	0.0252	0.0078	-0.0620	0.0041	0.0257	0.2111

Note: a. This parameter is set to zero, because it is redundant.

All of the regressions were statistically significant, explaining at least 85% of the variation in the logarithm of gross external debt and its components. Further, there were significant differences in the logarithm of gross external debt and its components between the regions. Gross external debt for Europe & Central Asia was significantly higher than for Sub-Saharan Africa, and significantly lower for Middle East & North Africa than for Sub-Saharan Africa. Public and public guaranteed external debt was significantly higher for East Asia & Pacific and Latin America & Caribbean than for Sub-Saharan Africa, and significantly lower for Europe & Central Asia and Middle East & North Africa than for Sub-Saharan Africa. Short-term external debt was significantly higher for Europe & Central Asia than for Sub-Saharan Africa, and significantly lower for all other regions than for Sub-Saharan Africa. Variable rate external debt was significantly lower for Middle East & North Africa than for Sub-Saharan Africa, and significantly higher for all other regions than for Sub-Saharan Africa. Also, there

was significant positive trend in public and public guaranteed external debt, and significant negative trend in short-term external debt.

Further, GDP was significantly positively related with gross external debt and short-term external debt; while net FDI inflows was significantly positively related with short-term external debt and significantly negatively related with public and public guaranteed external debt. Thus, economic growth plays a driving role in the growth of external debt, particularly short-term external debt, and FDI inflows also stimulate short-term external debt, but have a substitution effect on public and public guaranteed external debt.

The results of the fixed-effects panel regression for public and public guaranteed external debt as a percentage of gross external debt, short-term external debt as a percentage of gross external debt, and variable rate external debt as a percentage of gross external debt are presented in Table 11 below.

Table 11. Fixed effects panel regression for PPG% external debt, ST% external debt, and VR% external debt

	Ext Debt PPG%		Ext Debt ST%		Ext Debt VR%	
Source	F Stat	p-value	F Stat	p-value	F Stat	p-value
Corrected model	145.5465	0.0000	54.8811	0.0000	52.0190	0.0000
Intercept	0.2186	0.6410	31.5264	0.0000	3.2340	0.0749
Region	76.9931	0.0000	51.4345	0.0000	61.3757	0.0000
Post-crisis	0.0916	0.7627	3.6830	0.0576	1.1948	0.2768
ln(GDP at market prices)	14.4459	0.0002	68.9316	0.0000	1.3686	0.2446
ln(net FDI inflows)	23.7912	0.0000	0.6938	0.4067	2.4895	0.1175
year	1.7305	0.1911	38.9827	0.0000	3.0607	0.0830
	R ² = 0.923		R ² = 0.818		R ² = 0.810	
	adj R ² = 0.916		adj R ² = 0.803		adj R ² = 0.794	
Parameter	coeff.	p-value	coeff.	p-value	coeff.	p-value
Intercept	-249.0284	0.6418	2294.0655	0.0000	-1227.7060	0.0723
[East Asia & Pacific]	6.6152	0.2137	-20.1199	0.0000	16.5005	0.0154
[Europe & Central Asia]	-24.0363	0.0000	-1.1667	0.3897	26.9937	0.0000
[Latin America & Caribbean]	8.3861	0.0518	-29.8336	0.0000	35.3745	0.0000
[Middle East & North Africa]	6.9959	0.0003	-0.9523	0.5037	1.4854	0.5292
[South Asia]	0.8834	0.7084	-15.6372	0.0000	16.6134	0.0000

Table 11 (cont.). Fixed effects panel regression for PPG% external debt, ST% external debt, and VR% external debt

	Ext Debt PPG%		Ext Debt ST%		Ext Debt VR%	
[Sub-Saharan Africa]	0(a)	.	0(a)	.	0(a)	.
[pre-crisis]	0.6174	0.7627	2.9912	0.0576	-2.8246	0.2768
[post-crisis]	0(a)	.	0(a)	.	0(a)	.
ln(GDP at market prices)	-12.1638	0.0002	20.3052	0.0000	-4.7435	0.2446
ln(net FDI inflows)	-5.8973	0.0000	0.7696	0.4067	2.4169	0.1175
Year	0.3921	0.1911	-1.4220	0.0000	0.6606	0.0830

Note: a. This parameter is set to zero, because it is redundant.

All of the regressions were statistically significant, explaining at least 80% of the variation in the percentage of the components of external debt. Further, there were significant differences in the percentage of the components of external debt between the regions. The percentage of public and public guaranteed external debt was significantly higher for Middle East & North Africa than for Sub-Saharan Africa, and significantly lower for Europe & Central Asia than for Sub-Saharan Africa. The percentage of short-term external debt was significantly lower for East Asia & Pacific, Latin America & Caribbean, and South Asia than for Sub-Saharan Africa. The percentage of variable rate external debt was significantly higher for all other regions except Middle East & North Africa than for Sub-Saharan Africa. Also, there was significant

negative trend in the percentage of short-term external debt.

Further, GDP was significantly positively related with the percentage of short-term external debt and significantly negatively related with the percentage of public and public guaranteed external debt; while net FDI inflows was significantly positively related with public and public guaranteed. Thus, economic growth also seems to play a substitution role for public and public guaranteed external debt.

The results of the fixed-effects panel regression for the ratios of gross external debt to GDP, public and public guaranteed external debt to GDP, short-term external debt to GDP, and variable rate external debt to GDP are presented in Table 12 below.

Table 12. Fixed effects panel regression for total external debt, PPG external debt, ST external debt, and VR external debt to GDP ratios

	Ext Debt TTL/GDP		Ext Debt PPG/GDP		Ext Debt ST/GDP		Ext Debt VR/GDP	
Source	F Stat	p-value	F Stat	p-value	F Stat	p-value	F Stat	p-value
Corrected model	26.2993	0.0000	53.3240	0.0000	22.8708	0.0000	33.4055	0.0000
Intercept	0.3032	0.5830	1.1303	0.2900	8.5701	0.0042	0.1628	0.6874
Region	11.9364	0.0000	15.4205	0.0000	21.0962	0.0000	46.6881	0.0000
Post-crisis	3.1403	0.0792	2.2665	0.1351	0.5416	0.4633	3.0335	0.0844
ln(GDP at market prices)	10.0431	0.0020	11.9636	0.0008	0.3030	0.5831	5.2243	0.0242
ln(net FDI inflows)	0.4637	0.4974	4.1178	0.0448	3.8069	0.0536	3.0849	0.0818
Year	0.0003	0.9857	0.0904	0.7643	7.6142	0.0068	0.4119	0.5223
	R ² = 0.683		R ² = 0.814		R ² = 0.652		R ² = 0.732	
	adj R ² = 0.657		adj R ² = 0.798		adj R ² = 0.623		adj R ² = 0.710	
Parameter	coeff.	p-value	coeff.	p-value	coeff.	p-value	coeff.	p-value
Intercept	479.5369	0.5804	541.3209	0.2860	546.4930	0.0041	-163.8599	0.6796
[East Asia & Pacific]	4.9011	0.5685	2.1599	0.6667	-3.2493	0.0811	6.3521	0.1080
[Europe & Central Asia]	7.4635	0.0104	-9.6889	0.0000	1.8811	0.0029	16.0891	0.0000
[Latin America & Caribbean]	3.7128	0.5922	0.7384	0.8551	-5.1298	0.0008	11.2855	0.0005
[Middle East & North Africa]	-15.5387	0.0000	-11.0173	0.0000	-2.6851	0.0001	-0.9072	0.5113
[South Asia]	-10.7353	0.0058	-10.2708	0.0000	-4.6731	0.0000	3.1734	0.0719
[Sub-Saharan Africa]	0(a)	.	0(a)	.	0(a)	.	0(a)	.
[pre-crisis]	-5.8556	0.0792	-2.9035	0.1351	-0.5239	0.4633	-2.6327	0.0844
[post-crisis]	0(a)	.	0(a)	.	0(a)	.	0(a)	.
ln(GDP at market prices)	-16.4316	0.0020	-10.4673	0.0008	0.6148	0.5831	-5.4214	0.0242
ln(net FDI inflows)	1.3338	0.4974	-2.3200	0.0448	0.8233	0.0536	1.5738	0.0818
Year	-0.0087	0.9857	-0.0847	0.7643	-0.2870	0.0068	0.1418	0.5223

Note: a. This parameter is set to zero, because it is redundant.

All of the regressions were statistically significant, explaining at least 65% of the variation in the ratios of gross external debt and its components to GDP. Further, there were significant differences in the ratios of gross external debt and its components to GDP between the regions. The ratio of gross external debt to GDP for Europe & Central Asia was significantly higher than for Sub-Saharan Africa, and significantly lower for Middle East & North Africa than for Sub-Saharan Africa. The ratio of public and public guaranteed external debt to GDP was significantly lower for Europe & Central Asia, Middle East & North Africa, and South Asia than for Sub-Saharan Africa. The ratio of short-term external debt to GDP was significantly higher for Europe & Central Asia than for Sub-Saharan Africa, and significantly lower for all other regions than for Sub-Saharan Africa. The ratio of variable rate external debt to GDP was significantly higher for Europe & Central Asia and Latin America & Caribbean than for Sub-Saharan Africa. Also, there was significant negative trend in short-term external debt.

Further, GDP was significantly negatively related with the ratios of gross external debt, public and public guaranteed external debt, and variable rate external debt to GDP; while net FDI inflows was significantly negatively related with the ratio of public and public guaranteed external debt to GDP. Thus, there is a negative size effect on the ratio of external debt to GDP, i.e., regions with higher economic growth tend to attempt to reduce their external debt in relation to their GDP. Again, FDI inflows had a substitution effect on public and public guaranteed external debt.

Discussion

The results of the study indicate some regional imbalances in external debt, which may increase the risk of sovereign-debt default.

East Asia & Pacific region was found to have a high level of gross external debt and a high percentage of short-term external debt, which suggests higher liquidity risk, as compared to other regions.

Europe & Central Asia region was found to have a high level of gross external debt, a high gross external debt growth rate, a high percentage of

variable rate external debt, a high ratio of short-term external debt relative to GDP, and a high ratio of variable rate external debt relative to GDP. This may be a reflection of the ongoing European Sovereign Debt Crisis, with the Greek economy in particular being forced to take rescue packages under increasingly stringent conditions.

Latin America & Caribbean region was found to have a high level of gross external debt and a high percentage of variable rate external debt, which suggests higher interest rate risk, as compared to other regions.

Middle East & North Africa region was found to have a high percentage of public and public guaranteed external debt, which suggests higher sovereign-debt default risk, as compared to other regions.

South Asia was found to have a high gross external debt growth rate, a high public and public guaranteed external debt growth rate, a high short-term external debt growth rate, and a high variable rate external debt growth rate in the post-crisis period. Thus, the region seems to have been most adversely affected by the Global Financial Crisis, as compared to other regions.

Sub-Saharan Africa region was found to have a high percentage of public and public guaranteed external debt and a high variable rate external debt growth rate in the post-crisis period, which suggests higher sovereign-debt default risk and interest rate risk, as compared to other regions.

Thus, each of the regions has some specific types of risk. The individual developing economies in the regions need to be examined carefully to isolate their contribution to regional sovereign-debt default risk.

The determinants of external debt and its components also need to be analyzed further. Though GDP and FDI were found to play a significant role in supporting external debt, and in particular in reducing public and public guaranteed external debt, other macroeconomic variables such as balance of payments would also be expected to play a role. Also, this would need to be analyzed at different levels. Thus, there is great scope for extending the study further.

References

1. Anderson, P.R.D., A.C. Silva and A. Velandia-Rubiano. (2010). Public Debt Management In Emerging Market Economies, *World Bank Policy Research, Working Paper 5399*.
2. Blancher, N., Mitra, S., Morsy, H., Otani, A., Severo, T. and Valderrama, L. (2013). Systemic Risk Monitoring ("SysMo") Toolkit – A User Guide, *IMF Working Paper 13/168*, (Washington: International Monetary Fund).
3. Brandao-Marques, L., Gelos, G. and Melgar, N. (2013). Country Transparency and the Global Transmission of Financial Shocks, *IMF Working Papers WP/13/156*, (Washington: International Monetary Fund).
4. Broner, F., Erce, A., Martin, A. and Ventura, J. (2013). Sovereign Debt Markets in Turbulent Times: Creditor Discrimination and Crowding-Out Effects, *NBER Working Paper Series No. 19676*.

5. International Monetary Fund (2006). Structural Changes in Emerging Sovereign Debt and Implications for Financial Stability, in *Global Financial Stability Report*, Washington DC (April 2006).
6. International Monetary Fund (2013). Staff Guidance Note for Public Debt Sustainability Analysis in Market-Access Countries, Washington DC, May.
7. World Bank and International Monetary Fund (2001). Developing Government Bond Markets: A Handbook, *World Bank Publications* (Washington: International Monetary Fund).

Appendix

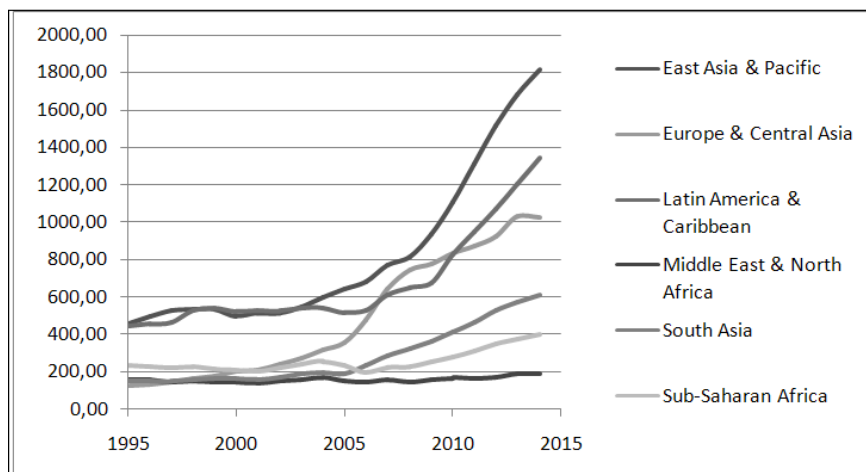


Fig. 9. Trends in total gross external debt region-wise