

Supplement
to the
Capital Adequacy
Principles
paper

Supplement to the Capital Adequacy Principles paper Illustrative Examples

Introduction

The Joint Forum on Financial Conglomerates, in the *Capital Adequacy Principles* paper, identified three techniques of capital measurement which are capable of yielding comparable and consistent assessments of the capital adequacy of financial conglomerates: the "**building-block prudential approach**", the **risk-based aggregation method** and **risk-based deduction method**. In addition the "total deduction" technique can also be of value, especially in addressing problems of double/multiple gearing.

The approach of the Joint Forum was to identify measurement techniques for the assessment of capital adequacy on a group-wide basis for heterogeneous financial conglomerates rather than to promote a single technique for universal application. As indicated in the paper, the measurement techniques have been found useful by a number of supervisors in assessing group-wide capital or in evaluating the impact of certain practices on regulated entities. Supervisors should have the flexibility to utilise the techniques appropriate for the specific circumstances of the particular financial conglomerates with which they deal.

The annexes to the *Capital Adequacy Principles* paper describe and provide examples of the measurement techniques.

The following theoretical examples illustrate situations that can be faced by supervisors in practical applications of the techniques. The purpose of the examples is to illustrate in a numerical way situations such as those described in the text of the *Capital Adequacy Principles* paper. The examples cross-refer to relevant text in that paper.

Only one technique, the risk-based aggregation method, is used in examples 3, 4, 5 and 6. It should be noted that similar problems to those depicted when using that technique would arise if the other techniques were used.

1. Double and multiple gearing.

This example illustrates a situation of double and multiple gearing as described in paragraphs 17 to 20 of the *Capital Adequacy Principles* paper

The parent is an insurance company which has a 100% participation in a bank which in turn has a 100% participation in a securities firm.

Insurance Company A1 (Parent)			
Assets		Liabilities	
Investments	5,000	Capital	1,000
Book value participations in:		General reserves	500
Bank B1	500	Technical provisions	4,000
Total	5,500	Total	5,500
Solvency requirement	800		
Bank B1 (Dependant)			
Assets		Liabilities	
Loans	8,750	Capital	500
Book value participations in		General reserves	400
Securities C1	250	Other liabilities	8,100
Total	9,000	Total	9,000
Solvency requirement	800		
Securities Firm B2 (Dependant)			
Assets		Liabilities	
Investments	4,000	Capital	250
		Reserves	250
		Other liabilities	3,500
Total	4,000	Total	4,000
Solvency requirement	400		

Without provisions to account for this corporate structure in measures of capital adequacy, it appears that solo capital requirements for the individual entities in this group are met. However, it is clear that a portion of the capital of the parent insurance company, i.e. the amount of 500 invested in bank B1 is levered twice, once in the parent and again in bank B1(double gearing). Furthermore, the amount invested by B1 in the securities firm B2 (250) which has already been levered twice is now being levered a third time, in the securities firm (when capital is being levered more than twice, it is said to be an instance of multiple gearing).

On the face of it, the group has total capital and reserves of 2,900 to cover total solvency requirements of 2,000. If the multiple gearing is eliminated the adjusted capital and reserves reduce to 2,150 leaving a surplus of only 150 over the capital requirements of 2,000. All three techniques should yield these results.

2. Undercapitalised unregulated holding company.

This example illustrates a situation of an undercapitalised group resulting from an undercapitalised unregulated parent holding company as described in paragraphs 23 and 25 of the *Capital Adequacy Principles* paper.

An unregulated holding company with two regulated 100% subsidiaries and one unregulated 100% subsidiary. Both regulated entities meet their solo requirements.

Unregulated Holding Company A1			
Assets		Liabilities	
Book-value participations in:		Capital	300
Bank B1	800	Other liabilities (long term loan)	800
Insurance company B2	200		
Leasing company B3	100		
Total	1,100	Total	1,100

Bank B1 (Subsidiary)			
Assets		Liabilities	
Loans	900	Capital	800
Other assets	400	Other liabilities	500
Total	1,300	Total	1,300

Insurance Company B2 (Subsidiary)			
Assets		Liabilities	
Investments	7,000	Capital	200
		General reserves	100
		Technical provisions	6,700
Total	7,000	Total	7,000

Unregulated Leasing Company B3 (Subsidiary)			
Assets		Liabilities	
Leases	2,000	Capital	100
		Other liabilities	1,900
Total	2,000	Total	2,000

Group (consolidated)			
Assets		Liabilities	
Bank loans	900	Capital	300
Other bank assets	400	General reserves	100
Insurance investments	7,000	Other bank liabilities	3,200
Leases	2,000	Technical provisions	6,700
Total	10,300	Total	10,300

(i) Assume the solo capital requirements/solvency margins of the regulated companies are as follows:

	<u>Requirement</u>	<u>Actual Capital</u>	<u>Surplus/(Deficit)</u>
Bank B1	100	800	700
Insurance Company B2	300	300	0
"notional" capital proxy for the Leasing Company B3	150	100	(50)

(ii) Under the **building-block prudential approach**, the aggregated solo capital requirements and proxies (B1 : 100; B2 : 300; B3 : proxy of 150: Total : 550) are to be compared with the consolidated capital (300 + 100 = 400). The group has a solvency deficit of $550 - 400 = 150$.

(iii) Under the **risk-based aggregation** method, the solo capital requirements and proxies are again aggregated (550); the total requirements are compared to the sum of the capital held by the parent and its subsidiaries, deducted from the amount of the intra-group holding of capital [300 (parent) + 800 (B1) + 300 (B2) + 100 (B3) - 1,100 (participations) = 400]. Again, the group has a solvency deficit of 150.

(iv) Under the **risk-based deduction method**, in the balance sheet of the parent the book value of each participation is replaced by its surplus or deficit value, i.e. total assets minus liabilities and minus capital requirement/proxy of the subsidiary. The book-values of B1 (800), B2 (200) and B3 (100) are replaced by the solo surplus/deficit identified under (i): B1 (700), B2 (0), B3 (-50).

The revised balance sheet of the parent holding company is then as follows:

Assets		Liabilities	
Participations in:			
B1	700	Capital	-150
B2	0	Other liabilities	800
B3	-50		
Total	650	Total	650

Again, the result of the calculation shows a group solvency deficit of 150.

(v) When there is an unregulated holding company, the total deduction method is not applicable.

(vi) Conclusions

Although both regulated entities meet their own solo or sector solvency requirements, the financial conglomerate on a group-wide basis is undercapitalised. The explanation is twofold: first, there is excessive leverage in the group, as the parent has downstreamed debt to its subsidiaries in the form of equity capital, and secondly there is an undercapitalised unregulated entity in the group.

As explained in the main text, the undercapitalisation of the group is a potential risk for both regulated entities. As shown in the example, the undercapitalisation can be revealed by applying appropriate measurement techniques for the assessment of capital adequacy at group level.

3. Minority interests and double gearing.

This example shows that where minority interests are present the choice between full integration and pro-rata integration can have a material effect on the assessment of group capital adequacy, as described in paragraphs 35 and 36 of the *Capital Adequacy Principles* paper. Paragraphs 28-37 provide guidance to supervisors on these issues.

Under all methods described in Annexes 1 and 2 of the *Capital Adequacy Principles* paper a decision has to be made, explicitly or implicitly, as to how to deal with minority interests in the various entities of the group. Essentially, the question is whether to include them by using full integration or to exclude them by using a pro-rata approach.

The example, using the risk-based aggregation method, demonstrates that full consolidation may yield a less conservative result than the pro-rata approach in cases where there are important surpluses and no deficits at solo level elsewhere in the group and thus, may mislead supervisors about the situation of the group.

Consider first a regulated parent and its 100% participation in a regulated subsidiary.

Parent	
Capital	100
Capital requirements	- 90
Participation 1 (historic cost)	40
SOLO SURPLUS	10
 Subsidiary 1 (100%)	
Capital	40
Capital requirement	- 25
SOLO SURPLUS	15
 Group (Parent + Subsidiary 1)	
Capital	140
- parent	100
- subsidiary	40
Capital requirement	- 115
- parent	- 90
- subsidiary 1	- 25
Participation (book value)	- 40
GROUP DEFICIT	- 15

Both institutions (parent and subsidiary 1) comply with their respective capital requirements at solo level. The assessment of capital adequacy at group level however reveals that there is an element of double gearing which would call for regulatory action from the parent's regulator. As a result the parent would have to increase its capital or to reduce its risk or the subsidiary's risk. (Since the parent has a 100% stake in the first subsidiary there is no difference between full and pro-rata integration).

Consider a situation where the parent also has a 60% participation in a second subsidiary with a considerable surplus at solo level.

Subsidiary 2 (60 %)

Capital	100
- parent	60
- minority interest	40
Capital requirements	- 25
SOLO SURPLUS	75

The group position would be as follows:

Group (Parent + Subsidiary 1 + Subsidiary 2)

	full integration	pro rata integration
Capital	240	200
- parent	100	100
- subsidiary 1	40	40
- subsidiary 2	100	60
	(60 parent's share; 40 minority interests)	
Capital requirement	- 140	- 130
- parent	- 90	- 90
- subsidiary 1	- 25	- 25
- subsidiary 2	- 25	- 15
Participation 1 (book value)	- 40	- 40
Participation 2 (book value)	- 60	- 60
GROUP DEFICIT	0	- 30

While pro-rata integration reveals a deficit at group level, full integration of the second subsidiary in the group calculation reveals no deficit because the second subsidiary's surplus compensates for the previous deficit at group level. This is because full integration regards capital elements attributable to minority shareholders as available to the group as a whole unless supervisors decide to limit the inclusion of the excess capital of this subsidiary. Of course, if the second subsidiary had a capital deficit at solo level then full integration would reveal a larger deficit at group level than pro-rata integration because full integration has the effect of placing full responsibility for making good the deficit on the controlling shareholder (the parent).

4. Inadequate distribution of capital

This example, which uses the risk-based aggregation method, illustrates, as did example 3, the implications of using a full-integration or a pro-rata approach. Paragraphs 28-37 of the *Capital Adequacy Principles* paper provide guidance to supervisors on these issues. At the same time, it shows the application of a notional capital proxy to an undercapitalised unregulated entity whose business activities are similar to those of the regulated entities, as described in paragraph 25 of the paper.

The existence of solo requirements should normally prevent deficits at solo level in firms of the group. In cases where one entity of the group has a solo deficit, supervisors should consider whether excess capital in other firms of the group can cover such solo deficit. In the following example this excess capital is needed to cover notional deficits in an unregulated entity.

Parent

Capital	100
Capital requirement	75
Participation	25 (historic cost)

Subsidiary 1 (50% participation)

Capital	60
- equity	50
- reserves	10
Capital requirement	10
SOLO SURPLUS	50

Group

	Pro rata aggregation	Full aggregation
Capital parent	100	100
Capital subsidiary	30 (50% of 60)	60
Capital requirement		
- parent	-75	-75
- subsidiary	-5 (50% of 10)	-10
Participation	-25 (book value)	-25
GROUP SURPLUS	25	50

The surplus at group level stems exclusively from the partly-owned subsidiary. However, in the event that the parent also had a participation in an undercapitalised unregulated entity, the group position would be as follows:

Unregulated Subsidiary 2 (100% participation)

Capital	20
- equity	10
- reserves	10
Notional capital requirement	-50
Notional solo deficit	-30

Group	Pro rata aggregation	Full aggregation
Capital	150	180
- parent	100	100
- subsidiary 1	30 (50% of 60)	60
- subsidiary 2	20 (100% of 20)	20
Capital requirements	-130	-135
- parent	-75	-75
- subsidiary 1	-5	-10
- subsidiary 2	-50	-50
Participation 1	-25	-25
Participation 2	-10	-10
GROUP SURPLUS	-15	10

Under the full integration approach, the surplus in subsidiary 1 is regarded as available to the group as a whole and it thus more than compensates for the deficit in subsidiary 2. The pro-rata approach on the other hand, only takes account of that part of the surplus in subsidiary 1 which is attributable to the parent and, as shown, this is not sufficient to offset the deficit in subsidiary 2 and the parent would either have to reduce its own risks, to increase its own capital or to renounce to the acquisition of the second firm.

5. Suitability of capital structure

The following example shows it is possible, at group level, that insurance risks are covered by banking capital (or vice-versa), even when the bank and the insurer that constitute the group each fulfil their solo capital requirements. Definitions of capital eligible for regulatory purposes differ considerably between regulatory disciplines and regulators carrying out an analysis of capital adequacy at group level should duly take into account these differences when assessing the suitability of capital elements to cover certain risks, as described in paragraph 37 of the *Capital Adequacy Principles* paper.

- A parent life insurance company has own funds of 500, of which 200 is paid-up share capital (also recognised by banking regulators);
- The remaining 300 stems from profit reserves appearing in the balance sheet and future profits, capital components which are only recognised by insurance regulators;
- The insurance company has a 100% participation in a bank subsidiary with a book value of 250. It therefore complies with its capital requirement of 250.
- In addition to the 250 paid-up share capital furnished by the insurance parent, the banking subsidiary has hidden reserves and reserves for general banking risk of 50 which - by definition - are not elements recognised as liable funds by insurance regulators. Its capital requirement is 300.

An undifferentiated, purely quantitative, calculation, based on the risk-based aggregation method, identifies a balanced capital position at group level with the sum of the capital elements equalling the capital requirements:

Capital of Insurance Parent		Capital of Banking Subsidiary	
Profit Reserves,	300	Paid-Up Share	250
Future Profits		Capital	
Paid-Up Share	200	Hidden Reserves and	50
Capital		Reserves for General	
		Banking Use	
Less Book Value of	250		
Participation			
Net Capital	250	Net Capital	300
Capital Req't	250	Capital Req't	300

Analysis reveals a deficit in group-wide capital for banking risk; leaving the question of overall capital adequacy to each individual supervisor:-

		Capital Requirements	
		Banking Risk	Insurance Risk
			Excess/Deficit
Insurance Capital	300	300	250
Banking Capital	50	50	250
"All-round" Capital	200	200	50
Excess/Deficit		- 50	0

The capital charge for insurance risk of 250 is more than covered by the 300 units of capital recognised only by insurance regulators; there is an excess of 50 units. The capital charge for banking risk of 300 is covered by 50 units of capital recognised only by banking regulators and by 200 units of capital recognised under both supervisory regimes; but the remaining charge of 50 is effectively covered by insurance capital - i.e. by capital components which banking regulators have deemed unsuitable for covering banking risks.

6. Quality of capital

As the previous example demonstrated, the divergence of capital definitions complicates the assessment of capital adequacy at group level in the sense that it introduces a qualitative element. The following example, using the risk-based aggregation method, shows that the importance of the qualitative aspect is not limited to the case of diverging capital definitions.

Parent

Capital	110
Capital requirement	90
Participation (historic cost)	20
SOLO SURPLUS	0

Subsidiary (100% participation)

Capital	50
- equity	20
- subordinated debt	30
Capital requirement	20
SOLO SURPLUS	30

Both, the parent's and the subsidiary's regulator recognise subordinated debt as capital elements eligible for regulatory purposes.

Group

Capital	
- parent	110
- subsidiary	50 (100% of 50)
Capital requirements	
- parent	-90
- subsidiary	-20 (100% of 20)
Book value of participation	-20
GROUP SURPLUS	30

The solvency surplus at group level stems from the subsidiary's subordinated debt. Although subordinated debt is an acceptable form of capital under the parent's own regulatory rules as well, the group surplus in this example is arguably only available to the subsidiary, in which case the regulator of the parent will need to guard against the possibility that this excess is used to cover risks at group level (e.g. a notional deficit in an unregulated entity). The use of subordinated debt capital to cover losses is limited to the institution which has issued it. Its integration in a group wide assessment of capital adequacy raises the same type of issues as the inclusion of minority interests.