

Schoenmaker, Dirk

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## **The Financial Trilemma**

*Dirk Schoenmaker*

*Duisenberg School of Finance, Amsterdam & Finance Department, VU University Amsterdam.*

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Duisenberg school of finance  
Gustav Mahlerplein 117  
1082 MS Amsterdam  
The Netherlands  
Tel.: +31(0)20 525 8579

# The Financial Trilemma

By

Dirk Schoenmaker\*

Duisenberg School of Finance  
Amsterdam  
&  
Finance Department  
VU University Amsterdam

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## Abstract

The financial trilemma states that financial stability, financial integration and national financial policies are incompatible. Any two of the three objectives can be combined but not all three; one has to give. This paper develops a model to underpin the financial trilemma. Our findings for financial integration suggest that the financial trilemma is in particular at work in Europe.

*JEL codes:* F33, G28, H41.

*Keywords:* Financial Stability, Public Good.

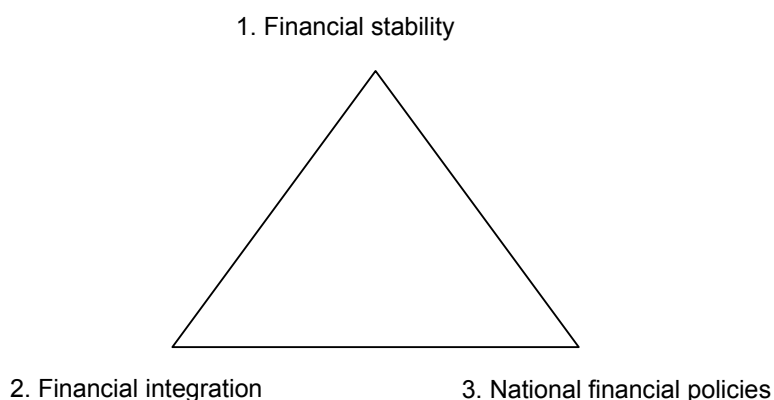
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## 1. Introduction

The 2007-2009 financial crisis highlights the need to manage financial stability. The question is how we can achieve financial stability in a world of cross-border banking. Financial stability is clearly a public good, as the producer cannot exclude anybody from consuming the good (non-excludable) and consumption by one does not affect consumption by others (non-rivalness). A key issue is whether governments can still produce this public good at the national level in today's globalised financial markets. In moving towards a solution, we put forward the idea of the financial trilemma. The financial trilemma states that (1) financial stability, (2) financial integration and (3) national financial policies are incompatible. Any two of the three objectives can be combined but not all three; one has to give. Figure 1 illustrates the financial trilemma. Rodrik (2000) provides a lucid overview of the general working of the trilemma in an international environment. As international economic integration progresses, the policy domain of nation states has to be exercised over a much narrower domain and global federalism will increase (e.g. in the area of trade policy). The alternative is to keep the nation state fully alive at the expense of further integration.

**Figure 1. The financial trilemma**



Central banks combine the tasks of monetary stability and financial stability. It is fair to say that the academic literature on monetary stability is far more advanced than that on financial stability. The classical monetary trilemma is built on the Mundell-Fleming model of an open economy under capital mobility (Mundell, 1963). The monetary trilemma famously states that (1) a fixed exchange rate, (2) capital mobility and (3) national monetary policy cannot be achieved at the same time; one policy objective has to give. Under capital mobility and national monetary policy, fixed exchange rates will invariably break down (Obstfeld et al., 2005). On the financial stability side, Thygesen (2003) and Schoenmaker (2005) suggest the possibility of a financial trilemma as financial integration is ongoing in the European Union (EU). However, they do not provide a theoretical underpinning of the financial trilemma. The lack of a rigorous underpinning is related to the lack of a clear and consensus definition of financial stability.

Financial stability is closely related to systemic risk, which is the risk that an event will trigger a loss of economic value or confidence in a substantial portion of the financial system that is serious enough to have significant adverse effects on the real economy. De Bandt and Hartmann (2002) provide an extensive discussion of the concept of systemic risk. A key element is that a considerable number of financial institutions or markets are affected by a systematic event. In a similar vein, Acharya (2009) defines a financial crisis as systemic if many banks fail together, or if one bank's failure propagates as a contagion causing the failure of many banks (see also Allen and Gale (2000) on contagion). In Acharya's model, the joint failure of banks arises from correlation of asset returns. Acharya (2009) finds that contagion leads to a reduction of aggregate investment in an economy.

## 2. *Modelling the trilemma*

We build on the model of Freixas (2003) to formalise the systemic effects of bank failure. The policy instrument in this model is a contribution of funds  $t$  by the authorities to refund a failing bank. The Freixas-model considers the ex post decision whether to refund or to liquidate a bank in financial distress. The choice to continue or to close the bank is a variable  $x$  with values in the space  $\{0, 1\}$ . Moreover,  $B$  denotes the social benefits of a refunding and  $C$  its costs. Among other things, the benefits of a refunding may include those derived from maintaining financial stability and avoiding contagion (Allen and Gale, 2000; Acharya, 2009). A minor, idiosyncratic, bank failure (e.g. Barings) would pose no systemic problem. If the direct cost of continuing the bank activity is denoted by  $C_c$  and the cost of stopping its activities by  $C_s$ , we only deal with the difference,  $C = C_c - C_s$ .

A social planner refunds a failing bank only when the total benefits of an intervention are larger than the net costs:  $B - C > 0$ . In a multi-country setting, the social benefits can be decomposed into the benefits in the home country, denoted by  $H$ , with fraction  $\alpha_h$  of benefits, and in foreign countries,  $F$ , which sum up to fraction  $\alpha_f = \sum_{j \in F} \alpha_j$ . The sum of  $\alpha_h$  and  $\alpha_f$  is 1. A cross-border bank is refunded only if a sufficient contribution from the different countries can be collected. This is an interpretation of improvised co-operation: the different countries meet to find out how much they are ready to contribute to the refunding, denoted by  $t$ . If the total amount they are willing to contribute is larger than the cost, the bank is refunded.

The optimal decision for each independent country  $j$  is to maximise:

$$x^*(\alpha_j \cdot B - t_j) \tag{1}$$

so that

$$\begin{cases} x^* = 1 & \text{if } \sum_j t_j - C > 0 \\ x^* = 0 & \text{if } \sum_j t_j - C < 0 \end{cases} \quad (2)$$

This game may have a multiplicity of equilibria, and, in particular, the closure equilibrium  $t_j = 0$ ,  $x^* = 0$  will occur provided that for no  $j$  we have:

$$\alpha_j \cdot B - C > 0 \quad (3)$$

that is, no individual country is ready to finance the refunding by itself. Obviously, if this non-cooperative equilibrium<sup>1</sup> is selected, the policy is inefficient as banks will almost never be refunded. The fact that in most cases the closure equilibrium will occur can be explained by the fact that part of the externalities fall outside the home country. In the spirit of Acharya (2009), these externalities result from forced asset sales impacting negatively on aggregate investment in a country. We assume that the country with the highest social benefits of a refunding is the home country of the ailing bank. The home country may not be prepared to meet the costs of refunding a failing bank in its entirety.

**Proposition 1.** *In a setting of improvised co-operation, the efficiency of the refunding scheme depends on the size of  $\alpha_h$ . Only when the social benefits of the home country are sufficiently large  $\alpha_h \in \langle C/B, 1 \rangle$ , national financial policies will produce an efficient outcome.*

**Proof of Proposition 1.** The efficient solution is  $x^* = 1$  if  $B > C$  and  $x^* = 0$  if  $B < C$ . Using (1) and (2), the first best decision will be implemented in case  $\alpha_h = 1$ . Given that  $\alpha_h > \alpha_j \forall j \in F$ , a refunding ( $x^* = 1$ ) will only happen if the social benefits in the home country are larger than the total costs:  $\alpha_h \cdot B - C > 0$ . The home country refunds the entire financial institution:  $\alpha_h \in \langle C/B, 1 \rangle$ .

Otherwise  $\alpha_h < C/B$ , the closure equilibrium occurs ( $x^* = 0$ ), even when refunding is the optimal strategy:  $B > C$ .  $\square$

This proposition clearly states that when integration increases ( $\alpha_f \uparrow$  and  $\alpha_h \downarrow$ ), national financial policies will not produce a stable financial system. Cross-border banks in difficulties will be closed, even when it is optimal to refund these ailing banks to maintain financial stability. The model pinpoints

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<sup>1</sup> The repeated game solution is not applicable. While financial supervision is an ongoing exercise (repeated game), crisis management is a rare event (non-repeated game) with high financial stakes.

the public good dimension of collective refunding and shows why improvised co-operation (*ex post* negotiations) will lead to underprovision of refundings.

In terms of the financial trilemma, the model shows that financial stability and national financial policies are compatible in the case of no, or only limited, financial integration ( $\alpha_h \in \langle C/B, 1 \rangle$ ). When more substantial financial integration ( $\alpha_h < C/B$ ) and national financial policies are combined, financial stability can no longer be obtained.

### 3. Degree of financial integration

The model highlights the trade-off between financial integration and national financial autonomy. As financial integration increases measured by the spread of activities abroad ( $\alpha_f$ ), national policies become less effective (Proposition 1). How integrated is the banking system? There are several indicators to measure the spread of banking activities over different countries (Sullivan, 1994). An often used indicator is the Transnationality Index (TNI), which is calculated as an unweighted average of (i) foreign assets to total assets, (ii) foreign income to total income and (iii) foreign employment to total employment. Schoenmaker and Van Laecke (2007) report the TNI for the largest 60 banks using 2005 figures.

**Table 1. Geographical spread of activities for top 60 banks**

	Home country: $\alpha_h$	Foreign countries: $\alpha_f$
American banks	78%	22%
Asian-Pacific banks	86%	14%
European banks	53%	47%

Source: Schoenmaker and Van Laecke (2007)

Table 1 indicates that American and Asian-Pacific banks are primarily domestically oriented ( $\alpha_h \approx 0.8$ ). The degree of financial integration is limited. So, financial autonomy is still a viable strategy for American and Asian-Pacific countries. By contrast, the cross-border penetration of the European banks is close to 50% ( $\alpha_f \approx 0.5$ ). The model suggests that the European level of integration may lead to coordination failure in a setting with national financial autonomy.

A first policy option for the EU is to reverse the current level of integration. Some would argue to reinforce local control and ring-fence the cross-border operations of financial institutions (Pomerleano, 2009). To maintain direct control over systemically important operations from banks headquartered in another EU country, the authorities would then require these banks to establish locally incorporated subsidiaries endowed with their own capital instead of branches. The home country supervises the



parent bank, while the host country supervises the local subsidiary. The refunding of ailing banks would be allocated on a similar basis. A major drawback of this national approach is that it foregoes the benefits of financial integration (Abiad et al., 2009).

A second policy option is to take the financial trilemma to its logical conclusion and move powers for financial policies (regulation, supervision and stability) further to the European level. This would imply a European-based system of financial supervision, as proposed by De Larosière (2009). Crisis management operations to maintain financial stability should also be based on a European footing (Goodhart and Schoenmaker, 2009).

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