



# Mundell's trilemma: Policy trade-offs within the middle ground <sup>☆</sup>



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## ABSTRACT

Mundell's trilemma makes strong categorical predictions on monetary policy trade-offs, where a small economy either has to adopt floating exchange rates or a closed capital account to establish interest rate autonomy. However, the trilemma is silent about a functional description of respective trade-offs for intermediate 'middle ground' policies. Accounting for the entire space of such policies, we study monetary autonomy in an unrestricted and continuous manner for 20 (mostly) developed economies. Evidence suggests that interest rate dependence almost linearly increases with the FX stability indicator under financial openness. Thereby, full independence would require an intensity of FX volatility which policymakers might hardly accept. However, this strong trade-off can be relaxed efficiently by a moderate reduction of financial openness. Hence, such a policy might offer some protection against the global financial cycle and leaves a considerable scope to combine a domestic monetary policy with a reduced FX rate variability.

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## 1. Introduction

Mundell's 'macroeconomic trilemma' suggests that an economy can only realize two out of the following three policy goals: monetary sovereignty, capital market openness and exchange rate stability. While this trade-off is formulated categorically, it predicts binding restrictions that apply if policymakers opt for so-called 'middle-ground' policies (Aizenman et al., 2008).<sup>1</sup> Under full capital mobility, for instance, aversion of policymakers to (excess) FX rate volatility is likely to be reflected in constraints on domestic interest rate settings.<sup>2</sup> As a consequence, the need to follow world rate movements should increase with the weight that is assigned to the objective of FX rate stability. Furthermore, one would expect that this link could be mitigated to the extent that monetary authorities impose measures to reduce financial openness. The more effective these measures are, the weaker should be the trade-off between FX rate stability and interest rate autonomy. Hence, policymakers

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<sup>1</sup> 'Middle-ground' policies consist of a balanced combination of imperfect realizations of all trilemma objectives.

<sup>2</sup> Such constraints apply directly if economies stabilize FX rates by means of market interventions. They apply indirectly if formally floating economies follow world market interest rate movements to prevent strong FX adjustments (Calvo and Reinhart, 2002).

likely face a continuous trade-off between the policy objectives, such that a given shift towards one of these objectives necessitates a drop in the weighted average of the other two (Aizenman et al., 2008). However, the specific functional form of this continuous trade-off is unknown.

History tells that most economies have either not been willing or able to pursue one of the trilemma's three 'textbook' corner solutions permanently. For instance, open pegs often cannot be sustained in the long run (Friedman, 1953; Obstfeld and Rogoff, 1995; Calvo, 2001; Coudert and Couharde, 2009). Pure floats, in turn, are hardly pursued due to policymakers' aversion to strong FX volatility (Calvo and Reinhart, 2002). While opting for closed capital accounts seems hardly favorable, an open capital account implies that the domestic economy is exposed to the capricious flows of money around the globe that trigger repeated patterns of boom and bust (Korinek, 2011; Rey, 2013).<sup>3</sup> In this context, the financial globalization paradigm which had characterized the monetary policy landscape since the 1980s has come under sustained attack. After the great recession, it has been argued that many economies could readjust their trilemma configuration towards the 'middle-ground' (Aizenman et al., 2010a,b; Aizenman and Sengupta, 2013), with putting more emphasis on capital controls (rather than on FX rate flexibility). Expectedly, fostered capital controls change the trade-off among interest rate autonomy and FX stability which had constrained monetary policies of small developed economies during the era of financial globalization. Unfortunately, however, the empirical literature is rather silent on the monetary policy implications of such gradual changes of trilemma configurations within the middle ground.

It is the aim of this paper to investigate the extent of monetary autonomy associated with a comprehensive set of policy configurations. For this purpose, we provide a detailed empirical analysis of short and long term interest rate dependence conditional on a continuum of FX regimes and capital account configurations. Our study relates to two main strands of empirical literature on the trilemma. The first strand is represented by studies such as Frankel et al. (2004), Shambaugh (2004), Obstfeld et al. (2005), Miniane and Rogers (2007) or Bluedorn and Bowdler (2010). Mostly addressing categorical trilemma configurations, this literature highlights that monetary dependence tends to be higher for pegs than for nonpegs, while capital controls seem to foster independence (e.g. Shambaugh, 2004; Obstfeld et al., 2005).<sup>4</sup> Focussing on the measurement of monetary independence, this literature only takes a stylized view on the set of trilemma configurations, especially when distinguishing alternative degrees of financial openness. The second strand of the literature originates from Aizenman et al. (2008). It focuses on (i) documenting the evolution of country specific trilemma configurations (in terms of the three metric trilemma variables) over time, (ii) testing their binding nature, and (iii) relating the trilemma positions to macroeconomic performance (Aizenman et al., 2008, 2010a,b, 2011; Aizenman and Ito, 2012, 2013; Aizenman and Sengupta, 2013; Patnaik et al., 2011; Wu, 2011; Hutchison et al., 2012; Hsing, 2012; Popper et al., 2013). In contrast to the first strand of literature, the trilemma is considered in a continuous (linear) fashion. Rather than focusing on the measurement of associated interest rate dependence patterns,<sup>5</sup> however, this strand of literature addresses the trilemma's implications in a more general macroeconomic context.

Acknowledging the importance of middle ground policies, firstly, we study the monetary policy implications of the trilemma in a granular and flexible fashion. Taking advantage of semiparametric functional coefficient methodology (Cai et al., 2000; Herwartz and Xu, 2009), we assess interest rate dependence conditional on continuous states of FX stability and capital mobility. Following the intuition in Frankel et al. (2004), Shambaugh (2004), Obstfeld et al. (2005) or Bluedorn and Bowdler (2010), we measure policy dependence in terms of a country's need to follow world interest rates. To acknowledge that observed linkages might also reflect that central banks independently choose a similar stance of monetary policy under business cycle synchronization (Frankel et al., 2004; Shambaugh, 2004), moreover, we control for deviations from potential domestic targets of inflation or output similar to Clarida et al. (1998). In contrast to related studies proceeding from a continuous trade-off (e.g. Aizenman et al., 2008), we do not impose a specific functional form a priori but consider local sample averages obtained by kernel smoothing. Moreover, we distinguish between interest rate dependence in the short- and the longer run. Thus, we provide an agnostic and differentiated look at the monetary policy implications of the current paradigm shift away from unrestricted capital mobility. The considered panel consists of quarterly data for 20 (mostly) developed economies for the period 1978q1–2008q2.

To preview some results, we show that, for small countries' policy configurations with open capital accounts (fixed FX rates), any gradual change towards higher FX stability (higher financial openness) comes along with an (almost) proportional increase in interest rate dependence. Moreover, evidence suggests that full monetary autonomy would require a FX variability that policymakers would hardly accept. In practice, therefore, fully open capital accounts always imply some lack of independence. In contrast, configurations with intermediate financial openness inherit considerable freedom to reduce FX variability before facing economically sizeable losses of monetary autonomy. Hence, besides providing some protection against the global financial cycle, moderate restrictions to capital flows might leave a considerable scope to combine a domestic monetary policy with a reduced FX rate volatility.

<sup>3</sup> Rey (2013, 2016) notes that monetary authorities are often not capable to address key variables in monetary policy transmission mechanisms such as credit creation, leverage or asset prices despite a floating FX rate. In this sense, the monetary policy of small floating economies would not be independent from foreign policies that determine such global conditions. Accordingly, 'full' autonomy could only be achieved by closing capital accounts. In this study, however, we focus on interest rate independence which is a necessary (though not sufficient) condition for monetary independence.

<sup>4</sup> Some studies, however, do not provide evidence that capital controls improve monetary autonomy (Miniane and Rogers, 2007).

<sup>5</sup> For instance, monetary dependence is measured in terms of interest rate correlations, while patterns of short and the long run dependence are typically not distinguished.

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