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BACKGROUND PAPER



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IMF Advice on Capital Flows: How Well is it Supported by Empirical Evidence?

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Contents	Page
Abbreviations _____	iv
I. Introduction _____	1
II. Origins of the Fund’s Pre-IV Pro-Liberalization Predisposition _____	3
A. Liberalization in Advanced Economies _____	3
B. Liberalization in Developing Economies _____	4
C. The Fund’s Perspective _____	5
III. Emergence of the “Institutional View” _____	6
A. Benefits and Costs of Capital Account Liberalization _____	6
B. Capital Account Restrictions as Part of the Stabilization Toolkit _____	11
C. Assessment _____	16
IV. The Post-IV Evidence _____	18
A. Benefits and Costs of Capital Account Liberalization _____	18
B. Effectiveness of Walls and Gates _____	20
C. Assessment _____	25
V. Conclusions _____	25
References _____	30

ABBREVIATIONS

AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
CFM	capital flow management measure
EM	emerging market economy
EMP	exchange market pressure
FDI	foreign direct investment
GDP	gross domestic product
GFC	global financial crisis
GMM	Generalized Method of Moments
IOF	tax on foreign financial investments (Brazil)
IV	Institutional View on the Liberalization and Management of Capital Flows
OECD	Organization for Economic Cooperation and Development
TFP	total factor productivity
VAR	vector autoregression

I. INTRODUCTION

1. The IMF's original Articles of Agreement did not give the institution jurisdiction over member states' capital account policies, reflecting the founders' views, based on pre-WWII experience, that volatile capital flows could be macroeconomically disruptive. That experience suggested that there was no necessary presumption that open capital accounts would be most conducive to prosperity. Yet the institution's perspectives on the potential role of capital account policies have evolved over time from this initial stance. Over most of the 1980s and 1990s, the Fund was perceived as a strong advocate of capital account liberalization. The institution's views have continued to evolve more recently as the result of a complicated interplay among the broader economics profession's views on this issue, research conducted by the Fund's own staff, and—perhaps most importantly—lessons drawn by both the profession and the staff from country experiences. Chief among the latter were the crisis experience of emerging economies dating from the mid-1990s to the early 2000s, as well as the broader international experience during the 2008–09 global financial crisis (GFC) and its aftermath.¹

2. This recent evolution was brought together into an officially approved Institutional View on the Liberalization and Management of Capital Flows (IMF, 2012), hereafter the IV. The articulation of the IV has received substantial attention because it marked a perceived regime shift at the institutional level on the potential appropriateness of capital account restrictions.

3. The IV is essentially composed of three key propositions:

- (i) Full capital account liberalization is not necessarily advisable for all countries at all times, though it is likely to be desirable once the appropriate domestic conditions are in place.
- (ii) Even for countries that have fully liberalized, it may be appropriate at times to introduce temporary capital account restrictions to help cope with large capital movements.
- (iii) But such restrictions should be resorted to in limited circumstances—in coping with large potential capital inflows, for example, they should be used only when the exchange rate is not initially undervalued, the economy is not operating below capacity, and international reserves are already adequate. Even in such cases, they should be removed when the inflow episode subsides.

4. It was the first two of these components that attracted the most attention, because they implied an official institutional receptivity on the part of the Fund to the use of capital account

¹ It is not unusual for paradigm shifts in macroeconomics to be driven by dramatic, unexpected events, as appears to have been the case with the Fund's approach to capital account restrictions. The advent of Keynesian macroeconomics during the Great Depression, its demise in favor of "new classical" and "real business cycle" perspectives in the context of the stagflation and supply shocks of the 1970s, the reemergence of "New Keynesian" models in the wake of the Volcker disinflation of the early 1980s, and the prominence of financial market phenomena in post-GFC macro models are all cases in point.

restrictions that represented a break with the previous perceived stance of the institution's management, if not that of the Articles or even of all of its staff.²

5. The objective of this paper is to examine the role of empirical evidence, both in the form of systematic research done outside and inside the Fund as well as country experience, in the evolution of the Fund's views on capital account policies. I will argue that the empirical grounding for the IV is at best indirect—not so much because the staff of the Fund has failed to take into account work done by the profession at large on the issue of capital account restrictions, but rather because that work has not been up to the task of providing systematic policy guidance: while it has shed light on some relevant issues, it has fallen short of doing so on others. In the absence of such guidance, analytical reasoning, interpretations of lessons learned from specific capital flow episodes, and empirical investigations of the effects of specific restrictions—not always meeting the serious methodological and measurement challenges that such investigations face—have played prominent roles.

6. The perspective I will adopt in the paper is that the 1997–98 Asian financial crisis marked a turning point in the Fund's views on capital account policies. My contention is that, while the IV was *codified* in 2012, it emerged gradually and organically from the crisis experience of the late 1990s and early 2000s, supplemented by empirical research by both the profession and the staff during that time, and that the emerging view, at least with respect to the first two components of the IV, was subsequently supported by the experience of the GFC and its aftermath. Indeed, the eventual approval of the IV in 2012 is best understood not as the result of new information that became available around that time, but rather as the delayed response to the IEO's (2005) call for the systematic articulation, for the sake of clarity and uniformity of treatment, of the post-1998 evolving views of the Fund on capital account liberalization and capital flow management measures (CFMs). Where the empirical support is lacking, however, is with respect to the third component of the IV: the conditions under which the deployment of temporary capital account restrictions may be desirable. In my view, the conditions stipulated under the IV, which have the effect of considerably restricting the scope of circumstances in which the use of restrictions may be appropriate, are not fully justified by empirical evidence or recent experience and are best understood simply as a vestige of the institution's pre-IV hostility to the use of restrictions.

7. The structure of the paper is as follows: Section II will describe the basis of the Fund's negative perspective during the 1980s and early 1990s on the use of capital account restrictions. As mentioned above, the 1997–98 Asian financial crisis was a key turning point. The key questions are what changed after the crisis, and what role empirical evidence played in shaping the specific content of what emerged as the IV during its long period of gestation between that crisis and its specific articulation in IMF (2012). These issues are taken up in Section III. Section IV examines how the policy perspectives incorporated into the IV have fared in light of empirical

² IEO (2005) documented diverse views on this issue within the staff.

evidence and experience after the IV was articulated. The paper concludes with a critical assessment of the empirical support for the policy guidance encapsulated in the IV.

II. ORIGINS OF THE FUND'S PRE-IV PRO-LIBERALIZATION PREDISPOSITION

8. Since at least the early 1960s, the professional theoretical literature has suggested that capital account liberalization has the potential to provide a broad range of benefits for the liberalizing economy.³ These include:

- The ability of the liberalizing economy to support additional high-return investment beyond what can be financed from domestic saving (for capital importers), or to earn a higher return on domestic saving than is available at home by investing abroad (for capital exporters).
- The opportunity for the liberalizing economy to achieve greater income stability as the result of the international diversification of risk.
- Its ability to undertake riskier, but higher-expected-return, investment as the result of such diversification opportunities or the transfer of technology, thus enhancing total factor productivity growth.
- The enhanced opportunity that financial openness provides to increase domestic consumption smoothing through international borrowing and lending.
- The promotion of domestic financial development.
- The promotion of domestic institutional reform.
- The potential for enhanced discipline on domestic macroeconomic policies.

A. Liberalization in Advanced Economies

9. These theoretical arguments made a strong case for capital account liberalization, which was given expression by the Code of Liberalization of Capital Movements agreed by the Organization for Economic Cooperation and Development (OECD) members in 1961. That case was buttressed by the ensuing experience of the Fund's advanced member countries. The liberalization and increasing sophistication of domestic financial markets in those countries during that time created the conditions for financial capital to move more readily among them, increasing *de facto* international capital mobility among advanced countries despite the fact that many of them retained a variety of *de jure* restrictions on capital flows. By the late 1960s the degree of capital mobility among the major countries was such that capital flow pressures made it increasingly difficult to sustain clearly misaligned exchange rates, and the fact that such

³ See, for example, Obstfeld (1998), as well as Mishkin (2007, 2009).

misalignments emerged in severe form during the decade of the 1960s forced a transition to floating exchange rates among the major economies by the early 1970s.

10. The elimination of pressures to defend official exchange rate parities, and the difficulty of making *de jure* restrictions on capital movements effective in the face of increased *de facto* capital mobility, together with the theoretical arguments emphasizing the potential benefits of free capital movements, contributed to modifying attitudes toward capital account restrictions among the advanced economies, and beginning in the 1970s a process of *de jure* capital account liberalization was undertaken by many of those countries, culminating by the early 1990s in the elimination of the vast majority of restrictions on capital movements among advanced economies. The consensus that emerged during the 1980s—based essentially on analytical arguments such as those above rather than on empirical evidence—was that capital account liberalization was indeed appropriate for advanced economies.⁴

B. Liberalization in Developing Economies

11. No such consensus existed, on the other hand, for developing economies. It is notable that the Washington Consensus articulated by Williamson (1990)—which was designed to articulate the *professional* (not just international financial institutions') consensus that existed at the time on pro-growth policies for developing countries—intentionally did *not* include among its ten market-friendly policy principles the advocacy of free international capital movements.⁵ The fact that it was not a component of the Washington Consensus suggests that liberalization of the capital account did not muster the same degree of professional agreement for developing economies as did, say, trade liberalization.

12. Why not? As in the case of advanced economies, professional views on this issue did not seem to be based on systematic empirical evidence, but unlike in the case of advanced economies, these views were also not based on *a priori* analytical reasoning: after all, these capital scarce, poorly diversified economies with poorly developed domestic financial systems and often unstable macroeconomic policies should have been expected, on the basis of the analytical arguments above, to have potentially been in a position to reap large benefits from financial openness. Instead, the hesitation was based on episodic evidence, specifically on the adverse experience of Southern Cone experiments with financial openness in the late 1970s and early 1980s, as well as on the subsequent debt crisis and capital flight phenomena that doomed many Latin American countries—both inside and outside the Southern Cone—to a “lost decade” during the 1980s.

⁴ Professional empirical research on the macroeconomic effects of capital account liberalization began to emerge only subsequently (e.g., with Alesina, Grilli, and Milesi-Ferretti, 1994).

⁵ The consensus, as perceived by Williamson, favored the liberalization of FDI flows, but not of other types of capital flows. Williamson subsequently (2004) was explicit on the point that no professional consensus existed as of 1990 on the desirability of full capital account liberalization for developing countries.

13. Capital account liberalization among developing countries was certainly high on the professional research agenda. The policy response of the heavily indebted countries to the debt crisis of the 1980s, as well as the challenges of transition to the market in the formerly centrally planned economies during the early 1990s, gave the question of appropriate macroeconomic reforms in middle- and low-income countries—including capital account liberalization—a prominent place on the agenda. This resulted in a literature on the proper sequencing of macroeconomic and financial reforms that considered specifically the role of capital account liberalization in such a sequence. This work reached the view that the case for liberalization needed to be a nuanced one, recognizing that severe domestic price distortions, malfunctioning domestic financial systems, and deficient macroeconomic frameworks were likely to undermine the benefits that developing countries could hope to reap from liberalizing their capital accounts. This literature thus concluded that liberalization would be appropriate only after reforms in other areas had been put in place.⁶ As discussed below, two decades later this perspective was incorporated, essentially *in toto*, into the Fund's IV in the form of its "integrated approach" to capital account liberalization.

14. By the early 1990s, despite some professional ambivalence, not only had many advanced economies liberalized their capital accounts but many emerging and transition economies had done so as well. Their subsequent experience contributed a second reason for professional agnosticism about the wisdom of liberalization in such economies during the early 1990s post-Brady Plan clean-up of excessive bank debt. Many of them experienced a large surge of capital inflows to what now came to be known as "emerging economies"—for the first time driven primarily by portfolio (debt and equity) flows involving private agents on both sides of the transaction rather than public borrowing from commercial banks—an experience that was to be repeated episodically up to and beyond the Fund's adoption of the IV. These surges were perceived by the receiving countries as posing serious policy challenges—in the form of potential overheating, loss of competitiveness, and vulnerability to "sudden stops" and reversals—that raised the question of the potential role that capital account restrictions might play in meeting those challenges.

C. The Fund's Perspective

15. Somewhat surprisingly, despite the fact that capital account liberalization was not a component of the Washington Consensus as formulated in 1990 and despite the doubts raised for the profession by the early-1990s developments just described, by the mid-1990s the Fund had become associated with the advocacy of open capital accounts, not just in advanced economies, but also in developing ones.⁷

⁶ See Williamson (1991) and McKinnon (1993), as well as Fischer and Reisen (1994).

⁷ The October 1994 Interim Committee Madrid Declaration, for example, encouraged member countries to remove restrictions on capital flows.

16. This view was based in part on the benefits that capital account liberalization theoretically offered to developing countries in terms of increased access to external capital, in part on the perception that current account convertibility in developing countries, a larger presence of multinational firms in those countries, and the ongoing capital account liberalization in the advanced economies, had all combined to make restrictions on capital flows in developing countries less effective, and in part on the perception that the costs of restrictions could be large (see Mathieson and Rojas-Suarez, 1993, as well as Quirk and Evans, 1995).⁸ Doubts on effectiveness were based partly on empirical research both inside and outside the Fund.⁹ It is clear that during this time the Fund generally viewed *de jure* capital account restrictions in middle-income developing countries unfavorably. Indeed, the issue of amending the Articles to give the Fund a mandate in this area was actively discussed at the time, including at the 1998 Annual Meetings in Hong Kong SAR.¹⁰

III. EMERGENCE OF THE “INSTITUTIONAL VIEW”

17. This perspective is in contrast to what later emerged as the IV. What changed, and what role did empirical evidence play in the change? This section considers this question from the perspective of the three components of the IV: capital account liberalization (the removal of longstanding and comprehensive restrictions on capital flows, or “walls” in the terminology of Klein (2012)); the imposition of temporary restrictions as stabilization tools (“gates”); and the conditions under which it might be appropriate to deploy “gates.”

A. Benefits and Costs of Capital Account Liberalization

Pre-IV professional evidence

18. While tests of the effectiveness of capital account restrictions could frequently be found in the professional literature by the middle of the 1990s, somewhat surprisingly empirical tests of the various benefits suggested by theory from the removal of such restrictions are hard to find before this time.¹¹ This changed with the obvious challenges that increased capital mobility posed in the form of the dramatic outflows associated with the UK’s sudden exit in 1992 from the European Exchange Rate Mechanism and with the 1994 Mexican crisis, as well as of large inflows

⁸ Perceived costs included the postponement of needed reforms, administrative costs, encouragement of rent-seeking activities, and the possibility that evasion effects could spill over into other activities, expanding the size of the informal economy.

⁹ Some of the relevant work on the effectiveness of controls is cited in Mathieson and Rojas-Suarez (1993). See also Johnston and Ryan (1994) and the survey by Dooley (1995). The perceived costs of restrictions, by contrast, were not documented empirically—at least not in any systematic way—but were rather reasoned to be likely to exist on *a priori* grounds.

¹⁰ See Quirk and Evans (1995), as well as Fischer and others (1998).

¹¹ As mentioned above, Alesina, Grilli, and Milesi-Ferretti (1994) was one of the first papers to investigate the real effects of capital account restrictions/liberalization.

to emerging economies (the “capital inflow problem”) in the post-Brady Plan early 1990s.¹² By the mid-1990s the profession had begun to generate a large empirical literature testing the various hypothesized benefits of capital account liberalization. The somewhat surprising upshot from this literature was that the evidence supporting the theoretical arguments for such benefits did not prove to be clear cut.¹³

19. In particular, by the mid-1990s the professional literature had begun to recognize that the extent to which those benefits were likely to be realized in any specific liberalizing economy was likely to be highly context-specific, thereby qualifying some of the theoretical arguments for the benefits of capital account liberalization. In particular, the empirical literature suggested that liberalizing economies were more likely to reap those benefits if they were characterized by a strong domestic institutional environment, a reasonably well developed domestic financial system, and coherent and well-functioning domestic macroeconomic stabilization policies. Precisely because these characteristics could be expected to differ between advanced and developing economies, this empirical work supported the theoretical arguments of the earlier “sequencing” literature that the case for capital account liberalization needed to be highly nuanced.¹⁴

20. The Asian financial crisis that erupted in the second half of 1997 proved to be a turning point both for the profession and the Fund. The countries involved were the most successful emerging economies in the world, and had been very large recipients of capital inflows throughout the early 1990s, but especially in 1995–96.¹⁵ The enormous capital flow reversals that these countries (primarily Thailand, Indonesia, Malaysia, the Philippines, and Korea) underwent at the time, and their associated severe contractions in economic activity, bore out the concerns of early-1990s analysts of the “capital inflow problem” that large inflows carried with them the possibility of large and disruptive reversals.¹⁶ Indeed, many professional observers argued that premature capital account liberalization contributed to the emergence of the crisis in those countries, because countries in the region that had *not* liberalized their capital accounts appeared

¹² The term is from Calvo, Leiderman, and Reinhart (1994).

¹³ See, for example, overviews of this literature by Kraay (1998), Eichengreen (2001), and Edison and others (2004). It is worth keeping in mind that, while one possible interpretation of these findings is indeed that liberalization fails to generate the promised benefits, they are also consistent with the possibilities that, in keeping with the IMF’s view at the time, restrictions were largely ineffective or that the empirical proxies for them used in the literature were very noisy, biasing their coefficients toward zero in estimated regressions. Forbes (2004) agreed that the “macroeconomic literature has had limited empirical success to date in providing robust evidence on the benefits of capital account liberalization” but argued that there was stronger evidence in studies based on micro data.

¹⁴ It also helped to explain, of course, why the liberalization issue was much less controversial for advanced economies—which tended to meet the requisite conditions—than for developing ones, which often did not.

¹⁵ The perception at the time of the performance of these economies was well captured by the title of a large World Bank study published just four years before the crisis, *The East Asian Miracle*.

¹⁶ See Calvo, Leiderman, and Reinhart (1994).

to perform better during the crisis than those that had, and because at least one country (Malaysia) appeared to have used outflow restrictions effectively in response to the crisis.¹⁷

21. The Asian financial crisis was followed quickly by a succession of other emerging market crises, in Russia (1998), Brazil (1999), Ecuador (1999), Turkey (2001), and Argentina (2002). Moreover, several emerging economies that had previously liberalized their capital accounts (Brazil, Chile, Colombia, the Czech Republic, Malaysia, Thailand, and others) adopted new capital account restrictions to help them manage specific capital account shocks. In the meantime, there was an enormous volume of professional research, both on the consequences of capital account liberalization as well as on the effectiveness of capital account restrictions used by previously liberalized economies for the purposes of CFMs.¹⁸

22. Consistent with the earlier sequencing literature, and with the staff's emerging views on the proper pace of liberalization, the empirical professional literature at this time provided substantial evidence that the growth benefits of liberalization were indeed likely to be conditional. Several studies found that such effects depended importantly on per capita income, on institutional quality, and on the degree of domestic financial development.

23. In particular, Edwards (2001) confirmed that developing countries were less likely to benefit from liberalization than advanced ones; Klein (2003) found an inverted U-shaped relationship between the growth effects of openness and several indicators of government quality; Fratzscher and Bussiere (2004) found that the long-run growth effects of liberalization depended on institutional quality; Bailliu (2000) concluded that positive growth effects depended on the level of financial development; and Alfaro and others (2004) found that while "FDI alone plays an ambiguous role in contributing to economic growth ... countries with well-developed financial markets gain significantly from FDI."

24. Consistent with the last of these, a finance-oriented literature from this time, which tended to use stock market openness as the indicator of capital account liberalization, was much more optimistic about the effects of liberalization on growth (see Henry, 2000; Bekaert, Harvey, and Lundblad, 2001; Chari and Henry, 2004). Since active stock markets in which foreigners are eager to participate presuppose a sufficient degree of domestic financial development, these findings are consistent with those of Bailliu (2000).¹⁹ Another strand of the literature acknowledged that more open economies were more prone to crises but argued that they

¹⁷ A Fund staff study by Ariyoshi and others (2000) analyzed the relatively much more favorable experiences of the relatively closed China and India during the crisis.

¹⁸ Eichengreen (2001) surveys the former, and Magud and Reinhart (2006) the latter.

¹⁹ While the role of these factors commanded wide agreement within the profession, not everyone was on board with the view that liberalization could promote growth under the right conditions. For example, Edison and others (2002) could find no evidence that financial integration promoted growth, even after conditioning on factors such as those listed above.

enjoyed higher growth over the longer run despite the effects of the crises because of the benefits openness conferred (Ranciere, Tornell, and Westermann, 2008).

Pre-IV staff studies

25. Although the Fund did not immediately turn away from advocacy of capital account liberalization in response to the crisis experience and the new research, it became more cautious about “disorderly” capital account liberalization and more pragmatic *de facto* in its views on the use of restrictions as gates in previously liberalized economies.²⁰ Both perspectives—on the desirability of removing walls as well as of the potential value of imposing gates after walls had been removed—eventually formed part of the Institutional View.

26. With respect to the removal of walls, by 1998 the staff had already absorbed many of the messages of the early sequencing literature, in light of the mainstream interpretation of the destabilizing role of capital flows in the Mexican and Asian financial crises. A 1998 Fund Occasional Paper prepared by a staff team from the Research Department (Mussa and others, 1998) recognized that the case for capital account liberalization needed to acknowledge that unregulated flows under the wrong domestic circumstances carried the risk of severe financial crises such as those experienced in both Mexico and Asia. Those risks were perceived as arising both from the inherently volatile nature of international capital flows (as the result of herding phenomena caused by information asymmetries) and from deficiencies in the domestic economic environment. The still overall pro-liberalization, but somewhat chastened and thus more nuanced, view of the staff as captured in this paper is well summarized by the quote:

“... despite experiences with financial crises in a number of cases, the decisions of many countries to proceed with financial liberalization are important evidence that such liberalization, including capital account liberalization, is generally beneficial *when carried out under the appropriate safeguards.*” (p. 3, italics added).

27. It is safe to say, however, that the staff’s response to this more nuanced analysis was not to be less favorably disposed to capital account liberalization, but rather to increase emphasis on the urgency of implementing domestic financial and macroeconomic reforms that would indeed put the “appropriate safeguards” in place. Nonetheless, it is clear that already in 1998, while the ultimate goal of full liberalization continued to be endorsed by the staff, the crisis experience resulted in the increased recognition in the Fund and elsewhere in the profession that the *pace* of liberalization needed to be contingent on progress made in domestic institutional, financial, and macroeconomic reforms. The discussion of sequencing in Mussa and others (1998), for example recommended: (i) reforming the domestic banking system to ensure proper regulation and

²⁰ By 2002 Economic Counsellor Ken Rogoff, after noting that the Fund may not have been forceful enough in warning countries with weak financial systems and inadequate macro frameworks against premature liberalization, stated, “These days, everyone agrees that a more eclectic approach to capital account liberalization is required” (Rogoff, 2002). It is worth noting that in expressing this view, Rogoff cited the preceding eight-to-ten years of empirical academic research that had failed to provide unequivocal evidence for the benefits of liberalization.

capitalization before or in conjunction with capital account liberalization, (ii) giving primacy in inflow liberalization to FDI flows, (iii) liberalizing portfolio flows only after the appropriate domestic institutional infrastructure is in place, and (iv) liberalizing outflows only after macro disequilibria and severe domestic financial distortions (e.g., financial repression) are removed.²¹ These crisis-based lessons were only reinforced by the additional emerging market crises listed above, by professional empirical research on the conditions under which the benefits of capital account openness would be likely to be beneficial, and perhaps even more importantly, by empirical research done by the staff itself.

28. Research by the staff between the Asian crisis and the issuance of the IV focused on two issues: the effectiveness of walls in containing capital flows and the macroeconomic consequences of their removal. Regarding the first of these, one way to assess whether capital account restrictions have indeed been effective is to assess the extent to which *de jure* restrictions help to explain *de facto* integration, using simple correlations. Dell’Ariccia and others (2008) did just this for large country aggregates. They found that in a cross-section of 74 countries, “liberalized” countries (those with lower than average *de jure* restrictions over 1975–2005 using the Schindler (2009) definition) had gross external assets and liabilities nearly twice as high as non-liberalized countries, suggesting that controls may have made a substantial difference. Similarly, for time series:

- The “least liberalized” countries (those with controls in the upper decile of intensity) saw smaller increases in *de facto* integration than those with less restrictive regimes over their sample period.
- Countries that switched from above- to below-average restrictions from the first to the second half of their sample saw increases in integration comparable to those of the most liberalized countries.
- For countries that tightened controls, integration converged to the lower and flatter trend of countries that had been closed throughout.

29. The implication of the view that restrictions can be effective is that capital account liberalization can indeed have real consequences. Staff empirical research during this time on the macroeconomic consequences of liberalization included Prasad and others (2003), who reviewed the existing professional empirical literature on the potential benefits of globalization, documenting its ambiguous conclusions, and provided their own original evidence that liberalization did not necessarily reduce the volatility of consumption relative to income in developing countries, contrary to the putative consumption-smoothing benefit of globalization. The empirical work in this paper supported the view that good institutions and macro frameworks were required for developing countries to reap the growth and stability benefits of liberalization. Similarly, Kose, Prasad, and Terrones (2008), who investigated the effects of

²¹ Compare these prescriptions, for example with the subsequent “integrated approach” adopted by the IV (IMF, 2012, p. 14).

financial liberalization on total factor productivity growth, found that inflows of foreign direct investment and portfolio equity had positive effects on total factor productivity (TFP) growth, but the effects of debt-related flows were actually negative. In keeping with the nuanced findings of the broader literature, however, they found that these latter negative effects were attenuated in countries with better institutions and higher levels of financial development. Kose, Prasad, and Taylor (2009) tested for specific threshold phenomena in the effects of liberalization on growth, and consistent with the evidence of Kose, Prasad, and Terrones for TFP, they confirmed the existence of clearly identifiable thresholds for institutional quality and financial development beyond which the effects of liberalization on growth were positive. Interestingly, these thresholds were lower for FDI and portfolio equity flows than for debt flows.

30. It is clear that by this time the staff, chastened by the crisis experience of countries that had liberalized prematurely, had absorbed the lessons of the sequencing literature as well as of systematic empirical research both outside and inside the Fund: reaping the potential benefits of removing walls to capital flows—i.e., of liberalizing the capital account—was contingent on the domestic institutional, financial, and macroeconomic environment in the liberalizing economy. Nonetheless, the staff at this time also contributed work that added some further nuances to this perspective. Kose and others (2009) argued that these conditional findings need not imply a strict sequencing—that is, that strong institutions, a well-developed financial sector, and a robust macroeconomic framework need not be in place before capital account liberalization would prove beneficial—simply because capital account liberalization itself could be beneficial precisely by promoting institutional and financial sector development as well as by imposing discipline on macroeconomic policies. They surveyed professional research on those potential channels and found some suggestive (but by no means conclusive) evidence of their presence. Unfortunately, they did not resolve the tension between the role that domestic institutional, financial, and macroeconomic conditions could play in generating positive effects from capital account liberalization and the role of capital account liberalization could itself play in generating those conditions.

B. Capital Account Restrictions as Part of the Stabilization Toolkit

31. Whatever the resolution of the broad issue of capital account liberalization, it leaves in place the separate question of whether reintroducing some types of restrictions on a temporary basis could be useful in helping to manage capital flows in economies that have already liberalized. The flood of emerging-market financial crises that spanned the period from 1994 to 2002 appears to have been more influential in altering the Fund's views on the need to broaden the toolkit of policies to manage capital flows than the "surge" episode of the early 1990s had been. Somewhat ironically, the sudden stops and capital flow reversals associated with these crises called attention to the vulnerability risks created by large *inflow* episodes, and the potential role of inflow restrictions in managing them, while at the same time the extreme challenges of crisis management raised the possibility that temporary *outflow* restrictions could have a role to play in some cases.

32. The arguments for these state-contingent restrictions, and the extent of their effectiveness, need not, of course, be the same as those that applied to walls. The objective of these restrictions was to help cope with capital inflow surges or sudden capital account reversals, and they tended to be imposed in emerging economies with relatively well developed domestic financial systems and with previously existing post-liberalization channels for capital to flow in and out. For this reason, and because many of them did not apply comprehensively to all capital flows, it was not clear that evidence on the macroeconomic effects of the removal of walls would be pertinent to the evaluation of the potential usefulness of gates.

Pre-IV professional evidence on the effectiveness of gates

33. A necessary condition for gates to be desirable is that they be effective. Typically, effectiveness is assessed along three metrics: impact on the overall volume of capital flows, the composition of flows, and the impact on monetary policy autonomy. It is worth noting, however, that empirical tests of effectiveness face serious econometric challenges, not only because of the difficulty of measuring such restrictions, as mentioned previously, but also because the imposition of restrictions—at least in the form of gates—is likely to depend on anticipated capital flows and because the behavior of flows in the presence of restrictions depends on what other policies are implemented at the same time. The role of the exchange rate regime is a case in point: the behavior of the nominal exchange rate in the presence of restrictions is likely to depend on the intervention policies that the central bank is pursuing in the foreign exchange market.²²

34. Cross-country studies at this time were broadly consistent with the effectiveness of emerging-economy restrictions in altering the volume and composition of flows, as well as enhancing monetary autonomy:

- An early post-Asian crisis study by Reinhart and Smith (1998) examined the experiences of Brazil (1993), Chile (1991), Colombia (1994), the Czech Republic (1994), and Malaysia (1994). They found that inflow restrictions were successful in reducing the *volume* of inflows within a relatively short period of time in Chile, the Czech Republic, and Malaysia, but they did not find similar declines in Colombia or Brazil. The restrictions were associated with a lengthening of maturities in Colombia and Malaysia, but not in Brazil.²³
- Montiel and Reinhart (1999) attempted to assess the effects of inflow restrictions on the volume and composition of such flows for a group of 15 emerging and developing countries during the decade of the 1990s, controlling for the effects on inflows of domestic financial depth and monetary policy, as well as for the influence of international

²² These challenges have not always been confronted in the literature to be reviewed here, but it is beyond the scope of this paper to assess the extent to which they have been so in the individual studies to be discussed below.

²³ They argued that an important determinant of the apparent success of these policies was the stance adopted by monetary policy at the same time—specifically, the abandonment of aggressive sterilization of inflows, thereby allowing reduction in interest rates which reduced the attractiveness of domestic financial assets.

financial conditions. They found that inflow restrictions tended to significantly reduce the share of short-term flows, but that the evidence for effects on the overall volume of capital flows was much weaker (the relevant coefficient bore the right sign but was not statistically significant at conventional levels).

- Edison and Warnock (2003) examined the effects of restrictions on access by foreigners to equity markets in five Asian and four Latin American emerging market economies (EMs) on portfolio equity flows from the United States during 1989–99. Their annual panel regressions indicated that US holdings of equities in emerging economies were indeed affected by capital inflow restrictions, as emerging economies with lower capital account restrictions experienced greater portfolio equity flows from the United States during the decade—an effect that they found to be economically important in magnitude.
- Kaminsky and Schmukler (2000) looked at the effects of capital inflow restrictions imposed by five emerging economies (Brazil, Chile, Colombia, Malaysia, and Thailand) during the 1990s. They found that changes in an index of Brazilian capital account restrictions had short-run impacts on both the volume and composition of private capital inflows (portfolio flows were reduced relative to FDI), but that the impact peaked after about six months and died out thereafter.

35. Gates episodes were also extensively studied in individual EMs during this period. By and large, these individual country studies of inflow gates implemented during the 1990s tended to find that inflow restrictions were successful in preserving some degree of monetary autonomy and in altering the composition of inflows in favor of longer-term flows, and had at least temporary effects on the total volume of inflows in countries including Brazil, Chile, Colombia, and Malaysia.²⁴ Effects on broader macroeconomic objectives, like resisting real exchange rate appreciation, proved harder to detect.²⁵

Pre-IV staff studies on the effectiveness of inflow gates

36. Research by the staff at the Fund tended to find results consistent with those of the broader literature:

- An important staff study (Ariyoshi and others, 2000) concerned the experiences of five emerging economies (Brazil, Chile, Colombia, Malaysia, and Thailand) with the use of inflow gates and of three other countries (Spain, Malaysia, and Thailand) with outflow

²⁴ On Brazil see, for example, Cardoso and Goldfajn (1997), and on Colombia, Cardenas, and Barrera (1997). There were many studies on Chile's unremunerated reserve requirement during this time (e.g., Valdes Prieto and Soto, 1996; Edwards, 1999; De Gregorio, Edwards, and Valdes, 1999; Gallego, Hernandez, and Schmidt-Hebbel, 1999; and the survey by Nadal De-Simone and Sorsa, 1999).

²⁵ Most of these studies, however, did not control for the exchange rate regime that was in place at the time the gates were implemented.

controls during the 1990s. The conclusions from these case studies were varied: inflow controls allowed countries to maintain a wedge between domestic and foreign interest rates, in some cases (Malaysia and Thailand) reduced the level and altered the composition of inflows, in others (Chile and Colombia) altered the composition of inflows, but not necessarily the level, and in Brazil they were largely ineffective.²⁶ Outflow controls appeared to be effective in Malaysia, but only temporarily so in Spain and Thailand.

- Later gates episodes in emerging economies were studied by Baba and Kokenyne (2011), who evaluated the experiences of Brazil (2008), Colombia (2007–08) and Thailand (2006–08). They found that inflow restrictions reduced the volume and increased the maturity of inflows in Colombia and Thailand, but not in Brazil, yet restrictions helped increase monetary autonomy in all three countries. On the other hand, those effects proved to be temporary in all cases, and in none of the countries did restrictions help to restrain real exchange rate appreciation. They interpreted their results as indicating that controls are more likely to be effective when they cover a broader range of capital account transactions, and less likely to be so when the domestic financial sector is well developed. They also argued that since the effectiveness of controls was likely to be temporary, gates are more suited to help cope with transitory inflow surges than with longer-lasting ones.
- Habermeier, Kokenyne, and Baba (2011) covered a larger group of emerging economies and examined both macroprudential measures and liberalization of outflow restrictions, using a methodology similar to Baba and Kokenyne's. Their results for the additional episodes covered were mixed, with inflow gates being at least temporarily effective in Croatia, but not in Peru, the Philippines, Uruguay, and Vietnam.

37. Other studies by the staff at the time bear on the issue of the effectiveness of restrictions, but do not distinguish between walls and gates:

- Dell'Ariccia and others (2008), for example, found that after controlling for standard gravity variables, a one-standard deviation increase in the index of capital controls (from the average Latin American value to the average East Asian value), using the Schindler (2009) indicator, reduced total bilateral liabilities per capita by 17 percent.
- Cardarelli, Elekdag, and Kose (2010) found that inflow restrictions had a negative impact on total private capital inflows in a sample of 109 surge episodes in 52 countries during 1987–2007, though they did not find that use of such restrictions was associated with better macroeconomic outcomes.

²⁶ It is hard to imagine, however, how inflow restrictions could succeed in maintaining a wedge between domestic and foreign interest rates without affecting the total magnitude of inflows.

- Ostry and others (2010) provided indirect evidence that restrictions mattered, finding that countries that used controls fared better during the global financial crisis than those that did not. Some potential reasons for this association were investigated by Ostry and others (2011), who found that the existence of capital account restrictions tended to be associated with a smaller share of debt liabilities in total external liabilities, as well as lower domestic borrowing in foreign exchange.

38. In short, the inflow evidence suggested that restrictions could often—but by no means always—be effective in restraining inflows and generally succeeded in shifting the composition of inflows toward less risky equity and longer maturity debt flows. Where explicitly tested, their effects on the total volume of inflows often proved to be temporary.

Pre-IV evidence on the effectiveness of outflow gates

39. The likely effectiveness of gates in moderating capital flow episodes is likely to depend on the intensity of the incentives motivating such flows. Because the incentives for outflows are greatest at times of anticipated or actual financial crises, evidence on the effectiveness of inflow restrictions in normal times may have little to say about the feasibility of outflow restrictions to play a useful role as part of the stabilization toolkit at times of stress.

40. The professional evidence on this issue has not always spoken very clearly. First, it has not frequently distinguished between outflow restrictions as walls or gates, and second, findings have been mixed. For example:

- In an early study, Eichengreen, Rose, and Wyplosz (1994) found that capital account restrictions reduced the probability of currency crises.
- On the other hand, Rossi (1999) explored the effects of inflow and outflow restrictions on both banking and currency crises in a 15-country sample from 1990 to 1997. He found that countries with more restrictions on *inflows* were less prone to currency crisis, though the liberalization of outflows appeared to have no effect.
- At the other extreme, Glick and Hutchison (2000), who used a sample of 160 currency crises that they identified in 90 developing and emerging-market economies over the 1975–97 period to investigate the effects of capital account restrictions on vulnerability to currency crises, concluded that capital account liberalization *reduced* the likelihood of a currency crisis in their sample of developing countries, but not in the emerging economy subset of their sample.

41. These studies, with their conflicting results, did not specifically address whether newly introduced outflow gates could be useful in coping with episodes of capital flow reversals—rather they addressed whether the presence of restrictions influenced the likelihood that an identifiable reversal episode would emerge at all. Reinhart and Edison (2001) focused more

specifically on the effectiveness of outflow restrictions in the context of crises, examining the experiences of Spain in 1992, Thailand in 1997, Malaysia in 1998, and Brazil in 1999, using daily financial data. Overall, they concluded that outflow controls did not reduce interdependence in Brazil and Thailand but did so in Malaysia.

42. It is, of course, possible that outflow gates could—at least to some degree—succeed in restraining outflows, but would nonetheless impose costs that would on balance make them inadvisable to deploy. The literature has not provided much evidence on whether outflow gates have in net terms proved beneficial in the countries using them. One notable exception is an ambitious study by Kaplan and Rodrik (2001) on Malaysia’s 1998 experience. Using a novel, but controversial, time-shifted difference-in-differences estimator to construct a counterfactual for Malaysia’s macroeconomic performance after it imposed outflow controls in the wake of the Asian crisis in September of 1998, they found that compared to Korea, Malaysia had a smaller drop in industrial production, in manufacturing employment, in real wages, and in the stock market, as well as a larger reduction in interest rates, less exchange rate depreciation, a larger increase in reserves, and a smaller increase in inflation. Except for the last, all these effects were statistically significant. They concluded not just that Malaysia’s outflow restrictions were effective, but also that they had beneficial effects on the country’s macroeconomic performance.²⁷ Loungani and Mauro (2001) found that the imposition of capital controls in Russia in 1998 possibly brought some short-run benefits by mitigating the volatility of capital flows but controls were unable to stem capital flight over a medium-term horizon and may have had considerable costs through increased corruption.

C. Assessment

43. In short, while the somewhat traumatic experience of the Asian crisis proved to be a turning point in the Fund’s perspective on policies toward the capital account, the institution’s reformed views as articulated in IMF (2012) were broadly in step with the empirical evidence produced both by the profession at large and by the staff itself over the post-Asia crisis period. This was clearly the case with respect to the “integrated approach” to capital account liberalization, which both followed the professional consensus on sequencing quite closely and was consistent with most of the empirical evidence on the conditions under which the potential benefits to be expected from liberalization were likely to be forthcoming.

44. The link to empirical evidence is less close with respect to the deployment of restrictions as inflow gates. The IV’s acceptance of the potential usefulness of inflow gates was consistent with professional evidence available at the time that such measures could be effective in reducing the volume and composition of inflows and enhancing monetary autonomy. Its

²⁷ Even if methodologically valid this is not, of course, a direct test of the effectiveness or desirability of outflow restrictions, since the differences between Malaysia and the comparator countries included many other policies, not just outflow restrictions.

emphasis on the *temporary* use of restrictions was also consistent with the evidence in studies that explicitly tested for the duration of effectiveness. But:

- While evidence that restrictions *could* be effective in moderating the volume of flows and enhancing monetary autonomy was certainly available, dissenting views existed, and the literature provided little insight into what types of restrictions were most likely to be how effective under what circumstances and for how long.
- The IV's perspective on the *conditions* under which it would be advisable to deploy gates was not similarly based on such evidence. Specifically, the IV's view that restrictions could have a role to play in response to inflow surges when the exchange rate is not undervalued, the economy does not have spare capacity, and reserve accumulation is adequate, was not based on systematic empirical evidence. At the time of the adoption of the IV, the literature had simply not provided empirically-based guidance on when the use of inflow restrictions might be beneficial in the sense described in the introduction—i.e., by providing benefits (in the form of the closer achievement of macroeconomic objectives while reducing the costs of deploying other policies) that exceed the costs of implementing such restrictions. In the absence of such guidance, it is hard to resist the conclusion that the staff's perspective was based on *a priori* reasoning, and that the content of that reasoning, which circumscribes the conditions rather narrowly under which inflow gates might be appropriate, was influenced by the Fund's longstanding resistance to capital account restrictions.
- Finally, the IV paid relatively little attention to the effects of restrictions on the *composition* of inflows, even though it was a fairly robust result in the empirical literature that inflow restrictions appeared generally to have been successful in shifting the composition of inflows toward longer-maturity instruments. This is an important channel through which restrictions can potentially affect macroeconomic and financial vulnerability. Yet this potential effect of restrictions did not factor into the IV's analysis of the conditions under which the use of inflow restrictions may be appropriate.

45. Professional evidence on the effectiveness of outflow gates is substantially weaker, except perhaps in the case of Malaysia, but it is worth noting that IMF (2012) did not specifically articulate a view on this issue, in contrast with that of inflow restrictions. In this respect, the IV appears to be close to the prevailing staff view prior to 2012 with respect to liberalization and inflow restrictions: the Fund has been open to the use of outflow restrictions in specific cases, but policy advice in this area has been provided without a fully articulated IV.²⁸

²⁸ The Fund issued a brief guidance note in 2015 (IMF, 2015) intended to address this gap, but it did not offer a distinct analytical framework, instead largely adopting a perspective for outflows that was closely modeled on that offered in IMF (2012) for inflows.

IV. THE POST-IV EVIDENCE

46. How has the policy advice captured in the IV fared in light of the subsequent evolution of empirical research both by the profession at large and Fund staff? It is of some interest that after the articulation of the IV, there was an outpouring of research by the staff on capital account policies, so much so that the staff made a disproportionately important contribution to the professional empirical literature on these issues after the issuance of the IV compared to what it had done previously. Nevertheless, in more recent years, the cutting edge of research on capital account matters has been located more prominently among academics, although promising new work is now under way at the Fund as part of a research program to develop an integrated policy framework to deal with external shocks.²⁹ This section summarizes notable developments in empirical research on capital account policies during recent years to assess whether such research carries lessons that would suggest modifications to the IV.

A. Benefits and Costs of Capital Account Liberalization

Professional evidence

47. The most comprehensive recent study conducted outside the Fund on the potential benefits of capital account liberalization was contained in a book dedicated to the topic by Jeanne, Subramanian, and Williamson (2012), published at about the same time that the IV was approved. The empirical component of this work is of particular interest, because it contained a meta-analysis encompassing several dimensions of previous empirical work on this issue. The authors identified seven ways in which previous studies of the relationship between liberalization and growth differed (measures of financial openness used, levels vs. changes in those measures, disaggregation into different types of flows, time horizons in cross sections and panels, threshold effects, conditioning variables, and data sources). They examined all combinations of those seven factors in a total of 2340 regressions. The effect of financial liberalization on growth was positive and significant (at the 10 percent level of significance) in only 7 percent of those regressions when appropriate GMM methods were used for estimation, and, consistent with earlier literature, was significant in at least 50 percent of the estimated regressions only under two circumstances: (i) when the sample consisted of advanced economies and financial openness was proxied by a de facto stock measure; and (ii) in the broader sample, when openness was defined by the stock of portfolio equity assets and liabilities relative to GDP. As in the earlier literature, this suggests that positive effects on growth depend on levels of institutional and financial development.

²⁹ See for example recent working papers by Gelos and others (2019) and Mano and Sgherri (2020), which explore the effect, interaction, and tradeoffs of such integrated policies and how country characteristics have influenced countries' choices of targets and instruments. This work program is still very much in progress and is not assessed in this paper.

48. Work on the implications of the removal of walls has been scarcer during recent years in the profession at large, perhaps because, based on earlier work, the conditional nature of the potential benefits from capital account liberalization has become widely accepted. In this sense, the IV is broadly in line with what has become conventional wisdom. A paper by Binder, Georgiadis, and Sharma (2016), for example, confirms the finding of the earlier literature that the growth benefits of capital account openness depend on whether the quality of the domestic institutional environment and the state of its financial development exceed specific thresholds, and if they do, those effects are positive and increase with the level of institutional and financial market development. But among the developing countries in their 1970–2009 sample that failed to exceed those thresholds, the growth benefits were “at best economically insignificant.”

49. Other post-IV professional work has progressed beyond examining direct effects of liberalization on growth and investigated some of the potential “ancillary” benefits of capital account openness, as well as some other potential implications of liberalization that were not part of the traditional analysis. For example:

- Islamaj and Kose (2016) investigated the effects of financial integration on the volatility of consumption relative to income. As predicted by theory, they found that integration helped to reduce the volatility of consumption relative to income in their country sample as a whole, but, consistent with the research on growth effects, this favorable effect was weaker for the developing countries in their sample than for advanced and emerging economies.³⁰
- Gallagher, Lagarda, and Linares (2017) introduced a new dimension into the analysis of the real effects of capital account liberalization: its potential effects on the distribution of income. In parallel with the growth literature, they found that in the context of high institutional and domestic financial development, liberalization could be conducive to a reduction in income inequality, but when these features were absent, and especially when liberalization was associated with crises, inequality could be aggravated.³¹

Post-IV staff studies

50. In contrast to research on the effectiveness of “gates,” discussed below, staff research on the benefits and costs of capital account liberalization has been more limited in recent years. Furceri, Loungani, and Ostry (2018) revisited the growth effects of capital account liberalization, finding that positive output effects are more likely when the financial sector is well developed,

³⁰ However, they were unable to explain the strength of the effect on the basis of specific characteristics of the countries involved.

³¹ These findings appear to have been confirmed in more recent research. Li and Su (2020) found that capital account liberalization is associated with a very persistent rise in inequality, Baek and Chia (2020) suggest that debt-creating flows are more associated with increased inequality than other flows, and Liu, Spiegel, and Zhang (2020) find differential impacts for inflows and outflows: increases in private capital inflows raise income inequality while increases in outflows reduce it.

financial inclusion is high, and liberalizing economies are able to avoid subsequent crises. Like Gallagher, Lagarda, and Linares (2017), they also considered the effects of liberalization on inequality, examining effects both on countrywide Gini coefficients as well as on industry-specific labor shares. They found increasing inequality on average as the result of liberalization, with more pronounced effects on inequality when the domestic financial system is poorly developed as well as when liberalization is followed by crises. Andreasen, Schindler and Valenzuela (2019) found that capital controls raise the cost of corporate debt for companies with more restricted access to alternative sources of financing.

B. Effectiveness of Walls and Gates

Post-IV professional evidence

51. The post-IV professional literature has provided somewhat more refined tests of the effectiveness of capital account restrictions than had been conducted previously. Some of these studies have raised questions about the effectiveness of gates. in particular:

- Forbes and Warnock (2012) distinguished between the direction of capital movements as well as the roles of residents and non-residents, focusing on the effectiveness of controls in ameliorating the extreme flow events that have been of special policy concern. Specifically, they examined the effectiveness of restrictions in containing episodes of large disaggregated gross (as opposed to net) flows by residents (“flight” for outflows and “retrenchment” for inflows) as well as by non-residents (“surges” for inflows and “stops” for outflows), using several measures of restrictions, based on quarterly data for 58 countries over 1980–2009. They did not distinguish between walls and gates, however. They found no evidence that restrictions, however measured, contributed to the amelioration of any of these types of extreme capital flow episodes.
- Klein (2012), who originally proposed the “walls” and “gates” terminology used in this study, used annual data from 1995 to 2010 for 23 advanced economies and 21 emerging markets to study the contrasting effects of structural inflow controls (“walls”) and state-contingent ones (“gates”). Using an original AREAER-based measure of such controls, he found that structural controls (which also tended to be more comprehensive across types of flows) were much more effective than state-contingent ones both in reducing the probability of a surge in inflows and in discouraging the emergence of several measures of financial vulnerability.
- Forbes, Fratzscher, and Straub (2015) examined the effects of *changes* in restrictions on inflows, outflows, and macroprudential policies on a broad range of macro and financial variables in a sample of weekly data from 60 countries during 2009–11; they dated changes in capital account policies from information contained in the AREAER. They used a propensity score matching methodology to control for the endogeneity of such changes, using countries with similar characteristics that did *not* implement changes as a

control group. They found that increased inflow restrictions had little effect on total capital inflows and several other macro variables but did reduce private credit growth, and that reducing outflow controls could induce depreciation of the real effective exchange rate.

52. Taken at face value, Klein's work supports the perspective that walls are generally more effective than gates, while the Forbes and Warnock; Klein; and Forbes, Fratzscher, and Straub results together obviously raise questions about the potential usefulness of capital account restrictions as gates. However, interpreting these results is not straightforward. They are from multi-country studies that of necessity not only have to paint with a very broad brush, but also that are especially vulnerable to issues of selection, endogeneity, and measurement error that are likely to bias results in the direction of a "no effect" finding.³²

53. Not least because of these methodological challenges, the robustness of these results with respect to alternative country samples and sample periods, estimation methodologies, and measures of restrictions (including how to distinguish empirically between walls and gates) is open to question. Many other studies have provided evidence that is more favorable to the effectiveness of gates.³³ For example:

- Ahmed and Zlate (2014) examined the effects of restrictions on capital inflows into 12 Asian and Latin American EMs over the period 2002:Q1 to 2013:Q3. They found specifically that new capital control measures introduced after the GFC in these EMs had a significant effect in discouraging both total and portfolio gross and net inflows.
- Hwang, Park, and Park (2017) examined the effects of capital account restrictions, using an AREAER-based measure, on gross and net liabilities as well as asset-driven surge and reversal episodes in a quarterly sample of 16 EMs during 1999–2013, controlling for a variety of global and domestic factors.³⁴ They found that inflow restrictions reduced the probability of liability-driven gross and net flow episodes (both surges *and* reversals), while outflow restrictions reduced the probability of asset-driven gross and net reversals, but not surges. On the other hand, they found no effects of capital account restrictions on the volumes of gross or net flows in normal times. Their conclusion was that such measures could protect against extreme flow events without distorting flows in more normal times.
- Erten and Ocampo (2017) examined the effects of inflow and outflow restrictions, foreign exchange-based restrictions, and financial sector-based restrictions on exchange market pressure (EMP), real exchange rate appreciation, and crisis resilience, using annual panel

³² See, for example, the comments by Forbes and Werning on Klein (2012).

³³ And the previously cited meta-regression results of Jeanne, Subramanian, and Williamson (2012) certainly give one pause.

³⁴ Like Forbes and Warnock, they did not distinguish between walls and gates.

data for 51 emerging economies from 1995 to 2011. Notably, they dealt with endogeneity concerns by instrumenting with the presence of bilateral trade agreements with the United States and EU membership, both of which strictly limit the use of capital account restrictions. They found that restrictions reduced EMP and real appreciation by statistically and economically significant amounts.³⁵ They showed that Klein's (2012) results were reversed when advanced countries were excluded from the sample, developing countries were included, and measures of restrictions were entered separately in their regressions, rather than together, to reduce multicollinearity. They also found that countries that had implemented inflow restrictions prior to the GFC had more favorable post-crisis growth performance.

- Like Forbes and Warnock, Pasricha and others (2018) also used *changes* in restrictions to estimate the effectiveness of gates in a sample of 16 EMs using quarterly data over the period 2001–12, applying a panel vector autoregression (VAR) methodology that allowed them to account for the potential endogeneity of restrictions. They found that inflow restrictions had statistically significant negative effects on gross inflows (the increase in external financial liabilities of residents), albeit not on net inflows (the increase in residents' external financial liabilities minus that in their external financial assets).
- Lepers and Mehigan (2019) distinguished between walls and gates based on the narrative explanation of the motivation for policy changes contained in the AREAER in a quarterly dataset with both advanced and emerging economies during 2000–15. They found that gates focused on portfolio or credit inflows as well as changes in reserve requirements on foreign exchange liabilities of banks were effective in reducing total non-FDI inflows, while equity-based gates were not, even after controlling for macroprudential policies as well as other types of both currency-based and residency-based measures.
- A comprehensive study by Magud, Reinhart, and Rogoff (2018) looked at more than 30 empirical papers on the effectiveness of capital account restrictions, both multi-country and single-country studies. They examined the effectiveness of controls on inflows as well as outflows. They concluded that controls on inflows seemed to make monetary policy more independent, to alter the composition of capital inflows in favor of longer maturities, and to reduce appreciation pressures on the real exchange rate, but that whether they reduced the total volume of net inflows was less clear. Regarding controls on outflows, they found little evidence of success outside of Malaysia: "there is Malaysia and there is everyone else."
- Finally, in a broad survey, Erten, Korinek, and Ocampo (2019) concluded that the evidence suggests that the use of gates has been conducive to increasing monetary autonomy in a number of emerging economies both in the 1990s and 2000s, and that, in

³⁵ Except in the case of financial sector-based restrictions, where the relevant coefficients had the right signs but were statistically insignificant.

contrast with some ambiguity in earlier work, the more recent cross-country studies have also found that inflow gates have been successful in reducing real exchange rate appreciation.

54. The broad-brush nature of multi-country studies leaves unanswered the critical questions of precisely what types of capital account restrictions—if any—can operate effectively as gates, as well as the specific conditions under which they may do so. Together with the methodological challenges faced by these studies, one interpretation of these results is that country-specific studies of particular “gates” episodes may be important to complement and enrich results from multi-country panels.³⁶

55. Alfaro, Chari, and Kanczuk (2017) conducted such a study for the important case of Brazil, which experienced substantial capital inflow surges following the adoption of the various quantitative easing policies by the U.S. Federal Reserve in the wake of the GFC. Beginning in October 2009, Brazil imposed a series of tax measures (the IOF) on several types of capital inflows. Using an event study methodology, Alfaro and her coauthors found that those tax measures had substantial real effects, increasing the cost of capital for Brazilian firms, and more so for firms more dependent on external finance with overall negative effects on investment, as would be expected. They also found that taxes on equity flows had larger negative effects on equity returns than those on debt flows.

Post-IV staff studies

56. Post-IV multi-country research by the staff, too, has generally tended to be supportive of the effectiveness of capital account restrictions. Reinhardt, Ricci, and Tressel (2013), for example, used a panel regression with non-overlapping five-year averages to examine the effects of the Quinn-Toyoda measure of capital account restrictions on total capital inflows over 1982–2006 for a large number of countries. Their study controlled for several other potential drivers of inflows, but like many other studies it did not distinguish between walls and gates. They found such restrictions to have powerful effects on total inflows, to the point that they interpreted the presence of restrictions as explaining the Lucas paradox—i.e., the failure of capital to flow in sufficiently large quantities from rich countries, where it is abundant, to poor countries where it is scarce and thus presumably offers a much higher return.

57. Other work by the staff, like the professional work outside the Fund, added nuance to the pre-IV work by distinguishing between types of restrictions and types of flows:

- Ostry and others (2012) also distinguished among types of restrictions, but focused on their effects on indicators of vulnerability, rather than on total flows. In particular, they

³⁶ Klein used a multi-country panel with annual observations on a dummy variable coded “1” in all years for countries with “walls,” and separated “gates” into two types captured by two dummies depending on the specific flows targeted, coding each annual observation “1” if a restriction of the relevant type was present in that country in that year, and “0” otherwise.

examined the effects of three types of restrictions (foreign exchange related prudential measures, domestic prudential measures, and financial sector specific capital controls) on several indicators of vulnerability (foreign exchange denominated lending by domestic banks, the share of debt in external liabilities, and domestic credit booms) for 51 EMs during 1995–2008, controlling for institutional quality and a composite measure of vulnerability to capital account crises. They found that foreign-exchange-related prudential measures and capital controls both reduced the share of foreign exchange lending by domestic banks and the share of debt in external liabilities.

- Ghosh, Qureshi, and Sugawara (2014) examined the effects on bilateral bank flows of both source and recipient country capital account restrictions, using a gravity model to control for other factors driving such flows. They examined separately the effects of overall capital account restrictions, restrictions on bond inflows, FDI and portfolio equity inflows, and financial credit inflows in the recipient countries, finding that aggregate measures, as well as restrictions on bond flows, had significantly negative effects on bank flows; the financial credit inflow restrictions were marginally insignificant, while restrictions on equity inflows were insignificant.
- Of special interest, Saborowski and others (2014) is one of the few studies that attempt to explore the determinants of the effectiveness of controls. To allow for the potential endogeneity of outflow restrictions, the authors used panel VARs for 37 countries estimated over 1995–2010 to examine the effect of outflow restrictions on capital outflows in those countries. They found that outflow restrictions did not reduce net outflows on average, but these average effects obscured some country heterogeneity. When VAR responses were conditioned on macro fundamentals, institutional quality, and the comprehensiveness of restrictions, outflow restrictions were found to reduce outflows for countries with strong fundamentals, good institutions, or comprehensive previously existing restrictions.
- Most recently, Cerdeiro and Komaromi (2019) noted that alternative empirical measures of countries' financial openness tend to agree with each other more consistently across the cross-section than the time-series dimension, and exploited this fact to assess the effectiveness of capital account restrictions by examining the effects on different types of capital flows of financial openness interacted with conventional "push-pull" drivers of such flows. They found that effects differ for different types of flows and different "push-pull" factors. Capital flows in more financially open economies are more sensitive to some, but not uniformly all, "push-pull" factors.

58. Finally, post-IV staff work has taken up the challenge of country-specific research on the effectiveness of capital account restrictions as gates. For example, Chamon and Garcia (2016) looked at the Brazilian 2009–11 inflow experience. Using daily interest rate, stock price, and exchange rate data, they found that the Brazilian IOF (an inflow tax) and other measures were able to segment the domestic fixed-income and equity markets from their international

counterparts (i.e., the measures created sustained return wedges between the two markets), but that effects on the exchange rate—which motivated the adoption of the IOF, were negligible until the full panoply of CFMs had been implemented in 2011. They therefore concluded that capital controls can be effective, but only if they are comprehensive.

C. Assessment

59. All in all, there are recurring themes in the most recent work that echo those of the pre-IV professional research both outside and inside the Fund:

- Consistent with the IV, the benefits from liberalization tend to be highly dependent on conditions in the liberalizing economy, notably domestic institutional, financial sector, and macroeconomic conditions.
- Evidence on the effectiveness of gates is mixed, and the nuances introduced in the most recent work have not contributed to the emergence of a consensus. Yet, despite the methodological challenges in multi-country work (especially measurement error, simultaneity, and heterogeneity), which could be expected to favor “no effect” findings, studies still find important real effects from the imposition of both walls and gates.
- What remains true, however, is that recent empirical work both outside and inside the Fund has shed little light on whether the conditions stipulated in the IV for the adoption of gates would be justified from a purely macroeconomic perspective. The requirements for providing such evidence are stringent. As indicated in the introduction, doing so would necessitate the use of a model that quantifies the costs of missing macroeconomic targets, of deploying other instruments to attempt to achieve such targets, and of implementing capital account restrictions. To date, such models are not at hand.
- On the other hand, recent evidence *has* shed much more light on a role for capital account restrictions that did not feature prominently in the IV: as a macroprudential tool. The evidence is both direct and indirect: the direct evidence suggests that restrictions have been instrumental in reducing indicators of vulnerability such as growth in domestic bank credit and the share of debt in a country’s external liabilities; indirectly, the empirical evidence has long indicated that restrictions have been effective in shifting the composition of external liabilities toward equity and longer maturity debt, a factor that has long been associated with reduced crisis vulnerability.

V. CONCLUSIONS

60. Taking the pre- and post-IV research, as generated both outside and inside the Fund, the state of play with regard to the empirical evidence on capital account restrictions can be summarized as follows:

- Walls appear to be effective in reducing the volume of capital flows. Much (but not all) of the recent evidence is consistent with this conclusion.
- While the removal of walls may potentially generate important growth benefits for low-income countries, the evidence that these benefits have indeed been reaped by countries that have liberalized is weak at best. The most reasonable interpretation of the evidence is that reaping the benefits of capital account liberalization is contingent on domestic circumstances in the liberalizing economies.
- In particular, benefits are more likely to be forthcoming when the domestic institutional environment is strong, the domestic financial system is efficient and robust, and the macroeconomic framework is conducive to stability. These findings are consistent with the revealed preference for capital account openness in high-income countries and with the more ambivalent view of capital account liberalization in low- and middle-income ones. It is also consistent with the messages of the “sequencing” literature on liberalization.
- There is also some but weaker evidence that removing walls may improve growth performance over a longer time frame through “collateral benefits” in the form of improved domestic institutions, enhanced financial development, and increased macroeconomic discipline.
- Regarding the effects of gates on the volume of *inflows*, many studies of the effects of gates in the form of inflow restrictions in specific EMs do find negative effects on the total volume of inflows at least temporarily. Among studies that do *not* find such effects, many nevertheless suggest that gates have been successful in enhancing monetary autonomy, though they tend not to explain how the absence of effects on the volume of inflows can be compatible with the enhancement of monetary autonomy.
- There is stronger evidence that inflow gates can be employed to alter the *composition* of inflows away from debt toward equity, and from short-term to longer-term debt, under a variety of country circumstances. Gates also seem to improve a variety of other indicators of vulnerability.
- Nonetheless, we know relatively little about:
 - The types of inflow gates that are likely to be most effective.
 - How strong those effects might be, for any specific type of gate.
 - The specific conditions under which inflow gates can have significant effects on total inflows.

- We also lack strong evidence about how long either the volume or compositional effects on capital flows might be expected to last under which specific circumstances.
- Regarding outflow gates, the research evidence is much more limited. There clearly appear to be cases in which outflow restrictions have been effective, but the number of such cases is limited, and there is little evidence of long-lasting effects. Indeed, outflow gates are typically deployed for brief crisis periods, and then gradually removed.
- Considering inflow and outflow gates together, many of the papers reviewed here contain lists of the likely costs of deploying capital account restrictions, but there is little empirical evidence about the magnitude of such costs. For example, there appears to be little evidence on whether the mere deployment of gates of either type has long lasting effects on the attractiveness of a country as a destination for capital inflows, one way or the other.

61. How should we evaluate the IV in light of this evidence? Several conclusions seem warranted. With respect to the process of capital account liberalization, involving the removal of walls in countries that have traditionally maintained them, the “integrated approach” of the IV is broadly consistent with the professional consensus that came out of the “sequencing” literature of the 1990s. Recent research seems to have added little beyond what emerged out of that literature. We know relatively little, for example, about:

- How to evaluate operationally the qualitative criteria judged to be important for the success of capital account liberalization (strong institutions, a strong domestic financial sector, and an appropriate macroeconomic framework).
- The potential tradeoffs among the various conditions that are likely to make liberalization succeed. Can a strong domestic financial sector, for example, compensate for deficiencies in domestic macroeconomic institutions?
- The extent to which capital account liberalization may itself accelerate the processes of reform on which the success of liberalization is itself dependent, and if it does, what the implications of these bidirectional effects might be for the appropriate sequencing of liberalization.

62. With respect to capital account restrictions as gates, the IV essentially acknowledges that under certain circumstances, restrictions can play a useful role in helping countries to address the challenges posed by large and volatile capital flows, but it provides limited guidance beyond that. Does the empirical evidence suggest that it should (or could)? My conclusions are that in some ways, despite its reticence, it actually goes too far, in others it does not go far enough, and in yet others its reticence is justified:

- In my view, the IV goes beyond what is justified by the empirical evidence in its perspective on the conditions under which inflow gates might be useful. As argued in

Section III, its call for the use of such gates in response to capital inflow surges only when certain outcome conditions are met (e.g., with respect to the GDP gap, exchange rate misalignment, and reserve adequacy) does not have a solid empirical basis. Similarly, its guidance that use of capital flow measures should be strictly temporary and in the context of a surge, and not preemptive, does not have solid empirical foundations. Analytically, the IV is incompatible with a broader perspective in which all available policy instruments have benefits and costs and are in principle substitutable for each other. (For further discussion, see the background paper by Korinek (2020) for the present evaluation.) In particular, there is no empirical basis, for example, on which to judge whether continuing to accumulate reserves would not be preferable to imposing inflow gates, even when reserves appear to be adequate, or whether imposing an inflow gate would not be preferable to fiscal tightening even when the economy is already operating at or near full employment and such tightening is called for based on long-term fiscal sustainability considerations.

- In other ways, the IV does not go as far as the empirical evidence suggests it could. The empirical evidence is fairly strong, for example, both that inflow gates can influence the *composition* of inflows, orienting it away from short-term debt flows and toward longer-term flows and equity, and that large stocks of short-term foreign exchange denominated liabilities are often implicated in crises. While the IV does recognize that inflow gates might be desirable for financial stability reasons, it nevertheless prescribes that they should only be used temporarily rather than as a regular instrument in countries' toolkit to manage the composition of inflows.
- Finally, in other ways the IV justifiably does not prescribe beyond what the empirical evidence might support. For example, it does not offer the staff guidance on the *types* of restrictions that may be appropriate in specific circumstances. While suggesting that gates should explicitly be temporary, it does not offer operational guidance on what that may specifically mean. It provides limited specific guidance on the relationship (not definitional, but operational) between capital account restrictions and macroprudential policies. In all of these cases, going further than the general principles enunciated in the IV would be hard to justify on the basis of the existing empirical evidence.

63. It is clear that the IMF's policy guidance can potentially be substantially improved by more empirical work on many of these issues. In the case of walls, a partial list of important topics includes the relationship between *de jure* and *de facto* capital account openness in specific country circumstances, the role that *de facto* liberalization can play in generating the potential ancillary benefits of capital account liberalization (such as promoting institutional reforms and policy discipline), and the tradeoffs that may exist among the potential "preconditions" that the literature has identified for successful liberalization. In the case of gates, a partial list would certainly include the benefit and cost calculations involved in responding to capital flow fluctuations by complementing other macroeconomic policies with capital account restrictions

(including the costs of deviations from macroeconomic objectives and the potential costs of alternative policy responses), as well as the conditions under which specific types of inflow and outflow restrictions can be effective in reducing flows (including just *how* effective they can be and for how long).

64. The Fund's country expertise, access to data, and highly qualified staff place the institution in a unique position to contribute to such a work agenda. Indeed, the Fund staff is now at work on an integrated policy framework to consider how monetary policy, foreign exchange intervention, macroprudential policies, and CFMs can best be combined to provide a robust toolkit to deal with capital flow shocks. While it is still early to make an assessment of this work, it is starting to yield relevant new research that shows promise.

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