

Challenges to Achieving Price Stability\*  
Opening Remarks

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Good morning, I am Manuel Ramos-Francia, a Vice-Governor and Member of the Board at Banco de México. I am also currently the Chairman of the Deputies of the International Monetary and Financial Committee (IMFC) of the International Monetary Fund (IMF). I mention this because at the end of my remarks, I will briefly touch upon some of the topics that are being discussed at the IMFC concerning the role of the IMF in the global economy.

On behalf of Banco de México, I would like to extend everyone a warm welcome to the annual *International Journal of Central Banking (IJCB)* research conference, “Challenges to Achieving Price Stability.” I would also like to express my gratitude to the conference organizers, the *IJCB*, and the Research Division of Banco de México.

As all of you know, in response to the global financial crisis, central banks in major advanced economies (AEs) adopted a series of unconventional monetary policies (UMPs) with two main objectives.<sup>1</sup> The first was to restore the functioning of financial markets and intermediation. This included all the way from liquidity provision to being a “market maker of last resort,” and comprised purchases of private and public assets. The second objective was to provide further monetary accommodation at the zero lower bound (ZLB). This objective included purchases of government bonds, as well as forward guidance. The need for UMPs brought to light fundamental problems in the theoretical underpinnings of what was, at the time, considered mainstream central bank macroeconomic modeling.

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<sup>1</sup>IMF (2013b).

Willem Buiter (2009) has emphasized that central bank macro modeling mainly rested on a “complete-markets paradigm.” Indeed, default, bankruptcy, and insolvency are not possibilities in a world where there exists a set of securities that spans all periods and states of nature, and in which intertemporal budget constraints are satisfied. Consequently, with the exception of using some unusual assumptions, funding and market illiquidity are not possible in such a setup. More generally, in such a paradigm, banks are redundant institutions.<sup>2</sup>

On a related note, Buiter (2009) also stresses that the practice of linearizing models and of assuming additive shocks gave place to business-cycle dynamics that were, by construction, stable. Thus, it was a futile effort toward understanding financial stability issues.

These policies, many believe, have given rise to more questions than answers in that terrain where theory and policy are closely intertwined. Allow me to name some of the most prominent ones.

- Should long-term price stability continue to be the primary objective of monetary policy? Alternatively, should there be new objectives such as financial and external stabilities (these in conjunction with other policies)?<sup>3</sup>
- Should we rethink the monetary transmission channels and economic relationships such as the Phillips curve?<sup>4</sup>
- Will there be new challenges to central banks’ independence, because of both economic and political reasons?<sup>5</sup>
- How should monetary policy interact with macroprudential and capital flows management policies? Moreover, is there a justification for the implementation in some cases of the latter?<sup>6</sup>

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<sup>2</sup>Freixas and Rochet (2008).

<sup>3</sup>See, e.g., Smets (2014).

<sup>4</sup>This question has given place to a lively debate. On the one hand, e.g., Faust and Leeper (2015) argue that the relationship between “measures of economic slack, such as the unemployment rate, and inflation has never been very tight, and that standard measures of slack have never shown any real predictive power for where inflation is heading.” On the other hand, e.g., Mericle and Struyven (2015) argue that the Phillips curve seems “alive and well” in the United States, although inflation has fallen short of its target.

<sup>5</sup>See, e.g., Kohn (2014).

<sup>6</sup>See, e.g., Ostry, Ghosh, Habermeier et al. (2011).

- How should we think about monetary policy at the ZLB?<sup>7</sup>
- Is there scope for aggressive monetary policy since, as some believe, the Wicksellian natural real rate may be close to zero or even negative at this time?<sup>8</sup>
- Should we forget about the dangers of fiscal dominance in countries where UMPs have been implemented?<sup>9</sup>
- Should there be greater international cooperation in the sphere of monetary policy?<sup>10</sup>

Of course, during the last few years, academics and policy-makers alike have been working hard and diligently on many of these issues, potentially laying the foundations of new ways of thinking about monetary policy and its interactions with other policies. In fact, forums like the IJCB have actively contributed toward improving this debate and will surely keep doing so in the future.

Today, I want to concentrate on a couple of particular issues listed: whether under some circumstances capital controls are justified, and whether more international cooperation in monetary policy is warranted. Indeed, I believe that one of the most important issues that we have learned since the onset of the crisis is that, in a highly integrated world, monetary policy does not work in isolation in the country of origin. To be sure, many have argued that it is now necessary to think about the possible spillovers and, in tandem, spillbacks that monetary policy can in effect create.<sup>11</sup>

It is useful to recall that prior to the global financial crisis, the overall perception was that if each country maintained an adequate and orderly set of economic policies, then the world economy would take care of itself. The perception was that if one country made a policy mistake, any repercussions would be mostly limited to that same country. What was needed in order to maintain economic and financial stability was only the exchange of information. This concept was

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<sup>7</sup>See, e.g., Coenen and Warne (2014) and Caruana (2015).

<sup>8</sup>See, e.g., Hamilton et al. (2015), Lubik and Matthes (2015), Rachel and Smith (2015), and Williams (2015), among others.

<sup>9</sup>See, e.g., Bank for International Settlements (2012).

<sup>10</sup>See, e.g., Ramos-Francia and García-Verdú (2013).

<sup>11</sup>See, e.g., IMF (2013a, 2015a, 2015c), Bowman, Londono, and Sapriza (2014), Bluwstein and Canova (2015), and Nuguer (2015), among others.

dubbed the house-in-order doctrine.<sup>12</sup> Needless to say, the recent global financial crisis was a harsh reminder of how inadequate such a perception was.

Indeed, it was thought that cooperation was not of first-order importance. As a result, there was no genuine joint effort to even debate and, thus, possibly agree on measures to take cooperation to a higher footing. Nowadays, we should know better. In effect, the world economy is quite different from how it was generally perceived then.

Let me mention a couple of points in this regard.<sup>13</sup> First, the level of interconnectedness between economies has dramatically increased in today's world. Beyond the global nature of many firms and financial institutions, this interconnectedness has changed in many dimensions during the past several years. Accordingly, among others, it has potentially increased feedback effects across different economies due to macroeconomic shocks. Thus, policies should be designed acknowledging this, ineludibly calling for cooperation.

Second, big economies need to take into consideration the consequences their policies might have beyond their borders—in particular, in small open economies. In this respect, one could take for granted that the implementation of certain policies is suitable for the markets for which they are envisioned. Yet, they might have unintended consequences in other economies.<sup>14,15</sup>

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<sup>12</sup>Although documented by Padoa-Schioppa (2006), he did not advocate such a doctrine.

<sup>13</sup>We have seen what an inefficiently regulated, inadequately supervised, incessantly changing, and highly interconnected financial system can lead to. Thus, there is clearly a need to advance the cooperation agenda.

<sup>14</sup>In this context, it is convenient to recall, as way of an example, the Dodd-Frank law and, in particular, the Volcker rule. President Obama signed the Dodd-Frank Act into law on July 21, 2010. The final version of the Volcker rule was published in December 2013, and banks have had to comply with such norms starting in July 2015. In general, the Volcker rule prohibits an insured depository institution from engaging in proprietary trading (see, e.g., Board of Governors of the Federal Reserve System 2014). This measure intends to reduce systemic risk.

<sup>15</sup>The Volcker rule could affect financial markets (such as of government and corporate bonds, and of over-the-counter derivatives) within the referred economies. For instance, since financial institutions in emerging-market economies (EMEs) that are affiliated with banks in the United States are also subject to the restrictions required by that rule, their demand for local private-sector

Considering a broader perspective, I believe that few would dispute that today the world finds itself in a growth malaise. Different reasons have been given to explain this.<sup>16</sup>

- Some emphasize a persistent aggregate demand insufficiency, and that the ZLB and the latent financial instability avert a more active monetary policy, a situation which has been called “secular stagnation.”<sup>17,18,19</sup>
- Others have underscored a slowdown in total factor productivity growth.<sup>20</sup>

As Rajan (2015), currently the Governor of the Reserve Bank of India, has argued, it is difficult “to disentangle the effects of weak aggregate demand from slow growth in potential supply.” In this context, nevertheless, the ever-present need for growth for societies and, of course, for politicians, elected or otherwise, has become even more urgent. Adding to this, the possibility of deflation has increased for some central banks. In particular, given the high levels of debt maintained by some agents, among other factors, countercyclical policies have mainly proven to be ineffective in restoring growth. On the

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securities may be negatively affected. Furthermore, although the Volcker rule exempts from its proprietary trading prohibition the operations of subsidiaries of U.S. institutions with their host-country governments’ securities, when the U.S. financial institutions’ cross-border operations in EMEs have a material importance in the domestic markets of these economies, the restriction imposed by the rule could affect the demand for government assets by U.S. banks. This, accordingly, might affect the local governments’ financial capacity.

<sup>16</sup>Rajan (2015).

<sup>17</sup>Hansen (1939) originally coined the term in his presidential address for the American Economic Association in an era of sluggish growth for the U.S. economy. He questioned whether there would be sufficient investment demand to sustain economic growth (Teulings and Baldwin 2014).

<sup>18</sup>Summers brought back the “secular stagnation” term in a speech at the IMF (Summers 2013). See also Summers (2014, 2015, 2016).

<sup>19</sup>This interpretation emphasizes that levels rather than growth rates damage the economy’s potential output associated with a crisis (Teulings and Baldwin 2014).

<sup>20</sup>Gordon (2012) argues that technological progress has returned to its low historical norm. Beyond technology, he focuses on four headwinds: demography, education, inequality, and public debt; Gordon (2014) claims that about half of the U.S. decline in participation comes from aging (Teulings and Baldwin 2014).

other hand, structural reform policies usually take time to implement and to deliver benefits to society, not least because politically they are complicated, as there is usually the need to end vested and deep-rooted interests.

Given then the need for growth, what other instruments are there to achieve it? Well, as all of you know, there are exports.<sup>21</sup> This is not only for the reasons that I just mentioned, but both because the potential global market for goods and services is, by definition, bigger than any individual country's market, and also because service-led growth needs a high value-added services sector which, for example, seems highly unlikely in most EMEs. Under sluggish growth conditions, however, all countries trying to increase exports at the same time is unfeasible.

Under reasonable circumstances, what would one expect about the workings of the global economy? Given the need for consumption smoothing at levels higher than present ones on the part of EMEs, one would expect to observe capital to flow from AEs to EMEs. One would thus expect the latter to invest and, at the end of the day, to enhance their economic growth and consumption, thereby increasing their demand for goods and services from advanced economies.

As we can remember from the 1990s and the early 2000s, in no small measure due to macroeconomic mismanagement, this ended in severe crises in many cases. As a result, many EMEs decided to change track, running current account surpluses or substantially lowering current account deficits, and accumulating international reserves, both to maintain exchange rate competitiveness and to self-insure against sudden-stop type of events (see Rajan 2015).

On the other hand, since the outset of the crisis, for AEs the central macroeconomic tool has been UMPs, both for financial and macroeconomic stabilization purposes and for attempting to restore growth.<sup>22</sup> These have been designed to compress term premiums and, in combination with forward guidance signaling low expected short-term rates, have contributed to lower long-dated bond yields to

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<sup>21</sup>Rajan (2015).

<sup>22</sup>In fact, monetary policy has been referred to as "the only game in town." See, e.g., White (2012), Wolf (2012), Bini-Smaghi (2013), Jones (2014), Bernanke (2015), El-Erian (2016), and Roubini (2016).

historical minimums in many AEs. In tandem, they have precipitated a very active search-for-yield process.

Of course, this has meant record amounts of capital flowing to EMEs and, to varying degrees depending on the policies implemented by them, contributing to appreciate (unsustainably) their real exchange rates with the concomitant relative price distortions and, in many cases, leading to credit and/or consumption booms. An important reason for this was the perception on the part of many of these economies that, due to favorable terms-of-trade shocks over a long period of time in the form of high and increasing commodity prices, in combination with the readily available foreign capital, they would be able to sustainably consume more than was really the case. Clearly, this led to a deterioration of current accounts in many EMEs, and to their improvement in AEs.

Nevertheless, if domestic-demand-enhancing policies are not implemented along with UMPs, this amounts (as happened largely in the case of EMEs following their 1990s and early 2000s crises) to demand diversion and not to demand creation. In particular, UMPs seem to start losing traction at some point, which—together with the never-ending politically motivated quest for growth—can result in strong incentives to continue, and even enhance, these policies. Also, it can make recurring to “populist” economic policies very tempting.

On the other hand, if at some point the decision is reached for the need to start reversing these policies, then EMEs in particular face another daunting challenge: that of the possibility of strong capital outflows. Evidently, trying to prevent the worst effects of this leads EMEs to accumulate reserves.

In sum, both AEs and EMEs have incentives to be engaged in a quest to divert demand to their own economies through policies that alter central bank balance sheets and, in the case of EMEs, additionally to self-insure against sudden-stop type of events.<sup>23</sup> Indeed, if the global economy does find itself in a growth funk to begin with (e.g., in secular stagnation), incentives to seek growth and to excessively

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<sup>23</sup>This has also led to discussions related to the structure of incentives derived from the current international monetary system (IMS) (non-system?). See Mateos y Lago, Duttagupta, and Goyal (2009), Farhi, Gourinchas, and Rey (2011), and IMF (2011, 2016b).

use UMPs to try to achieve it, in combination with EMEs' need to self-insure through accumulating reserves, will only end up reinforcing both the low growth equilibrium and the latent financial instability.

In my following remarks, I will dwell on the particular dilemma that many EMEs are currently facing, which results from the stage of the game we are presently at: the possibility of abrupt, large, disruptive capital outflows.

There has been an enduring and heated debate on the topic of capital flows and/or controls. As I mentioned, it has taken place amidst the unprecedented monetary policy stances that have been set in place in many AEs. Of course, EMEs have felt some of their spillovers. On the matter, the IMF has published two relatively influential working papers (Ostry et al. 2010 and IMF 2012).<sup>24</sup>

Broadly speaking, they recommend that if an economy faces a situation where authorities become cognizant of macroeconomic risks accumulating due to, among others, excessive capital inflows, it should respond with the following policies, albeit their exact implementation depends on the particular circumstances faced by each economy.

- (i) Allow the exchange rate to appreciate.
- (ii) Accumulate international reserves.
- (iii) Intervene in the exchange rate market.
- (iv) Relax monetary policies and tighten fiscal policies.

If all these responses have been judged to be exhausted, only then should authorities consider using capital controls. In particular, they should not be used to postpone other, perhaps very much needed, policies. In a nutshell, they see capital controls only as a complementary policy tool.<sup>25</sup>

In this context, two externalities initially called much of the attention of policymakers and academics alike. First, many have

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<sup>24</sup>See also Ostry, Ghosh, Chamon et al. (2011), Ostry, Ghosh, Habermeier et al. (2011), and Ostry, Ghosh, and Korinek (2012).

<sup>25</sup>Needless to say, this was a significant shift in the IMF's stance on the subject. In effect, as stated in *The Economist* (2013), it was as "if the Vatican had given its blessing to birth control."

seen UMPs as experiments, with possible highly unknown repercussions.<sup>26</sup> In particular, one of the channels through which UMPs work is through exchange rates. Accordingly, there are terms that are closely associated with it: currency wars and competitive devaluation and/or easing.<sup>27</sup> Second, some EMEs, which are recipients of capital flows, have implemented capital controls. These have, quite possibly, brought about significant policy uncertainty. Moreover, such policy responses can lead to several further difficulties: for example, they can deflect capital flows toward other economies. Accordingly, even under the case in which capital controls could make sense from an individual perspective, from a multilateral one, they might turn out to be problematic.<sup>28</sup>

What is more, though capital controls have been advocated as a policy option under some conditions, they can in fact be easily circumvented most of the time. Since their significant enforceability issues are well known, I will not dwell on them.<sup>29</sup>

It is important to note that, evidently, the current rationale for implementing capital controls (or intervening in the foreign exchange market, for that matter) is precisely the opposite one that gave rise to the previous discussion: this time, it is the possibility of large, abrupt, capital outflows that has given rise to their renewed interest.

In this sense, it is useful to consider some of the economic rationales that have been put forward by the academic literature motivating the use of capital controls, this time around in order to mitigate the effects of sudden stops. In what follows, I will briefly review three of the main recent papers.<sup>30</sup> First, Farhi and Werning (2014) consider the possible occurrence of a sudden stop. In their model, capital controls are set as subsidies on capital inflows and taxes on outflows. The authorities have as an objective to mitigate the archetypal consequences of a sudden stop: exchange rate depreciations, interest rate increases, current account reversals, and drops

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<sup>26</sup>Rajan (2013).

<sup>27</sup>Rajan (2014).

<sup>28</sup>See, e.g., Ostry, Ghosh, and Korinek (2012).

<sup>29</sup>Habermeier, Kokenyne, and Baba (2011) review the literature on capital controls. The authors argue that capital controls have little effect on overall flows.

<sup>30</sup>See also Ramos-Francia (2014b).

in consumption. Thus, the rationale they put forward for capital controls is to smooth the stabilization process when a sudden stop takes place.

Second, in Bengui and Bianchi (2014) households are occasionally subject to a credit constraint. Hence, their access to credit depends on the value of their current income, which in turn is a function of tradable and non-tradable goods prices. Then, if sufficient debt stock accumulates and a sudden stop takes place, the contraction of capital flows and the depreciation of the real exchange rate feed on each other through the credit constraint. In their model, a pecuniary externality exists because agents ignore the fact that as their debt increases they are more exposed to a sudden stop. The authors maintain that their externality can be addressed with capital controls. The gist of their model is that controls cannot be enforced on a fraction of agents. Thus, as authorities tighten the financial regulation (by establishing capital controls), the fraction of unregulated agents knows there is less probability of a sudden stop, and they take on additional debt. While the planner cannot control unregulated agents, she does account for these leakages when solving for her planning problem. The authors find that, notwithstanding the imperfect enforcement, capital controls are welfare improving. But when implemented, their cost essentially falls on the regulated fraction of agents, while their benefits are shared by both fractions.

Third, Korinek and Sandri (2014) study how pecuniary externalities lead to financial amplification in a small open economy. In their model, borrowers are financially constrained and do not internalize the effect their decisions have on the relative price of the non-tradable good (i.e., the real exchange rate). In contrast, savers are not financially constrained. Also, foreigners borrow/save and buy/sell the tradable good with domestic agents. When the financial constraint binds, the real exchange rate is more sensitive to changes in the borrowers' endowment, in particular in light of a sudden-stop-like episode. This is so given that agents' endowments are valued in terms of the price of non-tradable goods, a relative price, which deteriorates in the case of a sudden stop. The borrowers' constraint and the pecuniary externality lead to an amplification mechanism. Their model has the same flavor as the celebrated Kiyotaki and Moore (1997) model of credit cycles, as they both

have an amplification mechanism through financial constraints and collateralized borrowing.<sup>31,32</sup>

In sum, recently, there has been a development in the literature that uses general equilibrium models in which, for the most part, pecuniary externalities are used to justify the implementation of capital controls. While the aforementioned papers have much merit, I believe they do not focus on the most salient difficulties policymakers, particularly in some EMEs, are facing today.<sup>33</sup>

In light of this, let me explain what I think are today some of the most important policy issues for EMEs. The main dilemma is the need to balance the possibility of large capital outflows and/or volatility with the need to try to restore higher growth coupled with reduced policy space.

In order to dwell further, let me first briefly describe the current setup. The first element to consider is how the process of normalization of monetary policy in the United States will take place. It goes without saying that this should not be understood as a statement regarding its adequacy. In fact, this is not the case here or elsewhere in my remarks today.

Second, broadly speaking, some of the key problems for policymakers in the context of capital flows can be divided into two stages. Initially, the low levels of interest rates in AEs, partially resulting from the implementation of QE policies, gave investors the incentives to perform carry-trade operations and, thus, increased the already quite large capital inflows to EMEs. Afterwards, in the prelude of the increase in the U.S. reference rate, there were episodes suggestive

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<sup>31</sup>As known, Kiyotaki and Moore's (1997) model has two types of agents: borrowers and lenders. Borrowers need collateral (i.e., capital), since no one can force them to repay their debts. The existence of collateral amplifies output fluctuations. To see this, consider that, for instance, in a downturn, income from capital decreases, leading to a fall in its price and making it less valuable as a collateral. Accordingly, a less valuable collateral bounds the firms' investment, amplifying the downturn.

<sup>32</sup>See also Ramos-Francia (2014a).

<sup>33</sup>In the context of possibly large and volatile capital outflows, see Rey (2013) for an interesting view. In particular, she argues that given the presence of a global financial cycle, which under capital mobility affects the national monetary policies, a free-floating exchange rate regime might not be sufficient to conduct an independent monetary policy. Thus, she advocates restricting excessive leverage and credit, and managing the capital account.

of the extent to which capital flows could leave EMEs in a disorderly fashion.<sup>34</sup>

Associated with both stages, some elements can exacerbate such problems. For instance, there is the size of the global asset management companies (GAMCs), which have become very relevant players in EMEs' financial markets, partially because they operate mainly in an unleveraged way, whereas other financial institutions such as banks are now subject to much more stringent regulation. In particular, capital flows from GAMCs are large when compared to the size of some EMEs' financial markets.<sup>35</sup> These companies tend to follow similar investment strategies in EMEs' financial markets, leaning toward investing in just a few instruments like exchange-traded funds (ETFs) and wide indices like the World Government Bond Index (WGBI), and also tend to use similar risk-management tools.<sup>36</sup> All of this may contribute significantly to increase crowded trades.<sup>37</sup> Most of these elements can be considered cross-sectional channels of systemic risk.<sup>38,39</sup>

One of the current main causes of concern for policymakers in EMEs is not only the possibility of large capital outflows but also the volatility and overall dynamics of those flows. In this context, one useful approach to understanding this is to think of it as an agency problem among the owners of capital and its managers, involving a global monetary game, as in Morris and Shin (2014). In their model, asset managers (think of GAMCs)—which are risk neutral—interact with households—which are risk averse—in a risky bond market. All

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<sup>34</sup>See, e.g., Ramos-Francia and García-Verdú (2016).

<sup>35</sup>Roxburgh, Lund, and Piotrowski (2011) provide an overview on how the global financial markets, including capital flows, had recovered since the global financial crisis.

<sup>36</sup>Moreover, a strand of the literature criticizes some of the risk-management tools that are still in use; e.g., see Rowe (2013).

<sup>37</sup>For instance, Pojarliev and Levich (2010) develop methods to measure the "crowdedness" of a trade. They underscore the importance of detecting crowded trades due to the risk they might pose to the global economy.

<sup>38</sup>Wagner (2014) argues that cross-sectional risk, being a dimension of systemic risk, can surge through various channels such as the use of common funding sources, risk-management practices, and trading strategies, among others. See also Schoenmaker (2014).

<sup>39</sup>The amount of risk they are taking is possibly above the socially optimal one. See, e.g., IMF (2015b).

agents have access to a money-market account that provides a floating rate. This rate directly depends on the monetary policy reference rate in the (core) country. Both types of agents have to decide where to allocate their capital, in the risky (EME?) bond or in the money-market account. A key characteristic of their model is that as the number of managers with a position in the risky bond increases, the level of the bond price increases, and vice versa.

In the global monetary game, managers decide whether to keep investing a unit of their capital in the risky bond or to allocate it to the money-market account. To that end, they receive a signal regarding the reference rate, which affects the return yield on the money-market account. Moreover, each manager receives an independent signal of the reference rate. Thus, they follow threshold strategies, i.e., they make their portfolio decision depending on the level in which the reference rate's signal falls relative to a threshold.

The agency problem is derived from the previous setup, since the ultimate investors are too far removed from portfolio managers. Under these circumstances, ranking the asset managers' performance can mitigate the agency problem. The point is that asset managers, evidently, are averse to ranking last. This is so since then they can face fund redemptions and, more generally, their asset-gathering capabilities can be affected. Thus, in their model, managers that rank last are penalized beyond their unfavorable portfolio return.<sup>40</sup> This aversion introduces a coordination mechanism in the managers' portfolio decisions. In particular, such decisions can lead to jumps in prices in anticipation of expected small changes in (core) central banks' reference rates. Arguably, these elements can lead to run-like dynamics in (the higher-risk economy's) financial markets.

There are two key empirical implications of their model. First, as mentioned, as the number of portfolio managers with a position in the risky bond increases, the bond price increases, and vice versa. For the same reason, as a group of portfolio managers sell their positions in the risky bond, its price decreases proportionally to the size

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<sup>40</sup>In Morris and Shin (2014), the penalty depends on the proportion of investors whose portfolio has a higher value than the portfolio of the investor ranking last. Similarly, in Feroli et al. (2014), the penalty depends on the number of investors (referred to as *active investors*) with a position in the risky asset. As argued in Morris and Shin (2014), this mechanism is akin to the game of musical chairs. The effort one player exerts has an impact on the effort of others.

of the group. In contrast, in a large market, a decrease in its price will attract other managers and stave off the price reduction.<sup>41</sup>

In their model, there is no change in the economic fundamentals of the risky asset for its price to significantly change. In this regard, a typical characteristic of a systemic risk episode is that asset prices change without any apparent variation in their fundamentals.<sup>42</sup>

Second, as the number of portfolio managers with a position in the risky bond increases, the level of the interest rate threshold, which guides their portfolio decisions between the money-market account and the risky bond, decreases. Thus, as underscored by Morris and Shin (2014), the size of the managers sector is key to determining the possible market disruptions when monetary policy shocks take place.<sup>43</sup>

Their main empirical implications have been explored in at least two different contexts.<sup>44</sup> For instance, first, Feroli et al. (2014) explore the possibility of run-like dynamics in different types of open-end mutual funds. To assess these implications, they posit a model, which is a simplification of Morris and Shin's (2014) model. They find that for some types of funds, there is evidence of the possible presence of run-like dynamics.

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<sup>41</sup>Thus, under the absence of this type of mechanism, one would expect to observe that changes in the managers' positions have little to no implications for the risky bond price and vice versa.

<sup>42</sup>Freixas, Laeven, and Peydró (2015).

<sup>43</sup>This has as a significant implication that as the U.S. monetary policy rate has been maintained at unprecedented low levels, it has given leeway to a significant number of managers' positions in the risky asset.

<sup>44</sup>Along this line, Miyajima and Shim (2014) have found evidence showing that, during the past couple of years, investor flows to asset managers and EMES' asset prices have reinforced each other's movements. On a related note, the IMF (2015b) dedicates a whole chapter of its April Global Financial Stability Report to analyzing the asset-management industry and financial stability. It argues that "the delegation of day-to-day portfolio management introduces incentive problems between end investors and portfolio managers, which can encourage destabilizing behavior and amplify shocks." Similarly, Gelos and Oura (2015) argue that given the size of the asset-management industry and the fund managers' incentives problems, their behavior could amplify risk. Moreover, Jones (2015) claims that asset managers have incentives for institutional herding, and highlights the need for policy response beyond the traditional measures. For an overview, see the Office of Financial Research's (2013) report on the asset-management industry and financial stability.

Second, García-Verdú and myself (2015), under the same framework, explore the possible presence of run-like dynamics in bond flows associated with a group of EMEs. In effect, we find preliminary evidence favorable to the presence of run-like dynamics in bond flows.<sup>45</sup> Moreover, we find indications that changes in the U.S. monetary policy rate seem to affect the bond flows' dynamics. Interestingly enough, we also find that the U.S. monetary policy effects' strength on the bond flows dynamics has apparently increased in recent years. We run a battery of control and robustness exercises. In them, for instance, we find little evidence of run-like dynamics in equities flows associated with EMEs, and in bond flows associated with AEs, where financial markets are deeper.

Let me briefly discuss a possible policy response. At the heart of the model, there is an externality. Moreover, it is two-sided, affecting both EMEs and AEs. Stein (2014) argues that the policy response should depend on the level at which the run-like dynamics take place. If they take place at the investors' level, one could impose, for example, a redemption fee.<sup>46</sup> The economic rationale for such a measure is straightforward: a fee would make exiting investors internalize the effect on the risky bond price, which affects all of their peers that did not sell their positions, by making them incur considerable liquidity risk. Nonetheless, he argues that if the run-like dynamics take place at the fund managers' level, a policy response is less obvious.<sup>47,48</sup>

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<sup>45</sup>Although the agency problem is probably a very important channel contributing to volatile capital flows dynamics, there are other channels consistent with it. On a related note, Shin (2016) has recently assessed the risk-taking channel for the U.S. dollar (USD). He explains that as its key feature one observes that when the USD depreciates, banks lend more in USD to agents outside the United States, and vice versa. This ties the value of the dollar to global credit conditions. In particular, such a channel has relevant macroeconomic implications, e.g., through borrowers' balance sheets and governments' fiscal positions, making the value of the USD central for financial conditions in EMEs.

<sup>46</sup>In the context of the global game, it is not important to differentiate between investors and fund managers.

<sup>47</sup>The Financial Stability Board (FSB) is presently analyzing policies that could internalize the large liquidity risk derived from possible massive redemptions in the referred markets. See, e.g., FSB (2016).

<sup>48</sup>In the context of very high and volatile capital flows, the IMF has been conducting research regarding countries' experiences on the management of capital flows and the implementation of macroprudential policies. See IMF (2016a) and G-20 (2016).

Adding to the risks emanating from herd behavior and run-like dynamics, the probability of disorderly capital outflows from EMEs has increased due to recent changes in banking regulation (e.g., see footnotes 14 and 15), which seem to have contributed to a reduction in banks' holdings and trading of EMEs' securities. Also, technological change in financial markets such as algorithmic trading has also led to an increase in liquidity risks, adding to capital flows volatility.

In this context, there might be the perception that large disruptions in EMEs' financial systems are, from an AE's perspective, inconsequential. This is unfortunate. Any such perception might run the risk of repeating the mistakes made prior to the global financial crisis, by assuming away the possibility of contagion through financial markets.

Notably, these issues are mostly unrelated to the problems that were used to motivate the use of capital controls. In fact, in policy circles, it was widely believed that the capital controls discussion had been settled a long time ago. Yet, in the last few years, there has been an unprecedented degree of monetary policy accommodation in AEs. Given the low levels of interest rates in AEs, the search for yield has led to enormous problems in policymaking in some EMEs.<sup>49</sup> This has taken place in both of its facets: at first, the large capital inflow stage and, afterwards, the possibility of large, abrupt capital outflows starting when the perception is generated that the core country could start the process of normalizing monetary policy and, evidently, during such a process.

All in all, at present the global economy is characterized by slow growth, risk of deflation in several AEs, low interest rates, search for yield, and episodes of elevated volatility in financial markets reflected in so-called risk-on, risk-off periods. In this context, to conclude, let me mention two points. The first pertains to some of the key policies EMEs can pursue. The second relates to the need to take international cooperation to a higher level.

First, going forward, EMEs as I have said, face potentially daunting challenges. In this context, it is very difficult to over-emphasize that nothing can substitute for solid macroeconomic fundamentals. Fiscal policy should be tightened for different reasons, to a large

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<sup>49</sup>Ramos-Francia (2014b).

extent with the objectives of reducing pressures on the different components of risk in term premiums, and also of accommodating efficiently the shock to the real exchange rate. Monetary policy should be adjusted depending on different aspects, mainly on where long-term inflation expectations are anchored, but there may be complicated trade-offs present. In particular, the overall level of long-term inflation expectations is crucial to anchor the yield curve at the lowest possible levels, although financial stability considerations should also play a role in monetary policy. Financial authorities have to foster conditions under which financial markets can grow as deep, and as complete, as possible. Policymakers have to design, plan, and implement the necessary structural reforms and, finally, EMEs should have adequate international reserve levels to insure against possible sudden-stop type of events.

Crucially, these policies have to be seen and implemented as a package. In effect, there are neither silver bullets nor fail-safe reforms. Equally important is that EMEs that have consistently implemented more prudent macroeconomic policies should try to differentiate themselves from their peers as much as possible, especially now that the asset class seems to be under considerable strain.<sup>50</sup>

Second, regarding international cooperation, my contention is that for it to gain traction, we need to reassess its benefits and, in tandem, the eventual costs of continuing with the current international monetary system (IMS) (or non-system). This is not to say that cooperation can be easily achieved. In effect, in the words of the late Anna Schwartz, cooperation “is a fair-weather instrument because countries have independent interests that they will not sacrifice for the sake of the collectivity.”<sup>51</sup> Rather, it is motivating cooperation that is necessary given the otherwise potential dire consequences.

The theory on non-cooperative repeated games can tell us about why and where there has been cooperation, and where we can expect to see it in the future. More specifically, in such games the players’ willingness to cooperate closely depends on (i) their subjective

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<sup>50</sup>Clearly, with large enough external macroeconomic shocks, proper macroeconomic management may not be enough to avoid considerable costs of adjustment.

<sup>51</sup>Schwartz (2000).

discount factors, (ii) the level of economic activity, and (iii) the prevailing economic uncertainty. Thus, it is a fragile equilibrium, and cooperation can be brought to a halt in various instances.<sup>52,53</sup>

Cooperation then has to be called for by the realization that it is in the economies' interests to cooperate and that not doing so could bring about significant and long-lasting costs. The world should advance much more quickly on cooperative/coordinated solutions to some of these problems. Financial institutions such as the world's central banks have advanced along these lines, e.g., successfully implementing swap lines during the global financial crisis.

In addition, the IMF, as a key multilateral institution, has made available several types of credit lines to countries with a strong record of economic policies but that, nonetheless, could face challenges in the current environment. In particular, at the IMFC and also at forums like the G-20, policy tools such as the (design and architecture of) global financial safety net are considered to be very important for the world economy to achieve a better equilibrium. Indeed, these policy tools are fundamental for creating a more resilient IMS and, thus, securing better global economic growth. Some solid steps have been taken in the right direction, but more work remains to be done.

Thank you for your attention. Without further ado, let me wish you all a very successful conference and cede the floor to John Williams.

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<sup>52</sup>See, e.g., Green and Porter (1984) and Mailath and Samuelson (2006).

<sup>53</sup>For an application of this result in the context of cooperation among central banks during crises see, e.g., Ramos-Francia and García-Verdú (2013).

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