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Biswajit Panigrahi
Indian Institute of Technology, Hyderabad, India, la20resch11007@iith.ac.in

K.P Prabheesh
Indian Institute of Technology Hyderabad, India, prabheesh@la.iith.ac.in

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SPILLOVER EFFECTS OF CAPITAL CONTROLS: A CRITICAL REVIEW AND NEW AGENDA FOR THE FUTURE DIRECTIONS

Biswajit Panigrahi* and K.P. Prabheesh**

*Corresponding author. Ph.D. Scholar, Indian Institute of Technology, Hyderabad, India.
Email: la20resch11007@iith.ac.in
**Associate Professor, Department of Liberal Arts, Indian Institute of Technology Hyderabad, India.
Email: prabheesh@la.iith.ac.in

ABSTRACT

This study undertakes a critical review of the spillover effects of capital controls and their welfare implications. We provide a synthesis of the literature on both the theoretical and empirical literature on the spillover effects of capital controls. Furthermore, the role of similar economies (geographical region, and economic characteristics), direction-specific capital controls, Global Financial Crisis, asset-specific capital controls and the compositional effect of capital flows are discussed to explore the degree and extent of spillover effects of capital controls policy. Similarly, the welfare implications of capital controls depend on the policy motive behind the imposition of capital controls, the state of coordination between the source and destination countries, and among the destination countries. Our study indicates that the imposition of capital controls should be flexible, competitive or prudential and should take into account domestic conditions and circumstances. Also, there is a need for complementarity between conventional macroeconomic policies and capital control actions, and multilateral coordination between source and capital-receiving countries.

Keywords: Spillover effects of capital controls; Capital inflow and outflow controls; International welfare implications; Global policy coordination.
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I. INTRODUCTION

Capital controls have become one of the predominant policy tools to minimize the adverse effect of volatile capital flows in recent years, especially during the aftermath of the 2008 Global Financial Crisis (GFC). During the post-GFC, global interest rates declined to the bottom and the Emerging Market Economies (EMEs) experienced a large global capital inflow.[1] As these flows are subject to quick reversal, the macroeconomic fundamentals of EMEs become more vulnerable to global market conditions. Further, the weak absorptive capacities in EMEs have intensified the volatility of financial flows (Pagliari and Hannan, 2017). The associated vulnerabilities are exchange rate depreciation, declining asset prices, and adverse impact on the balance sheet effect of the externally borrowed firms. So, as a result, the boom-bust domestic cycles and other vulnerabilities are experienced across these countries.[2] According to Stiglitz (2000) and Stiglitz *et al*. (2006), capital market liberalization, although facilitates risk-sharing is one of the primary sources of resulting pro-cyclical capital flows, probability of a crisis, fall in aggregate economic activity, and contagion effects.[3] On the other hand, some authors recognize under certain circumstances several macroeconomic policy tools face limitations in managing large capital inflows.[4] In response to the high volatility in capital flows during the post-GFC period, a series of reports related to the International Monetary Fund's (IMF)'s institutional view and policymakers have advocated the systemic use of certain types of capital controls in the presence of pecuniary externalities (Ostry *et al*., 2011a; Ostry *et al*., 2011b; Ostry *et al*., 2012a; Ostry *et al*., 2012b; Jeanne *et al*., 2012; Korinek, 2020; IMF, 2011a; 2011b; 2012a; 2012b; 2018).[5] However, the institutional view of the IMF suggests capital control measures should be recognized as second-best policies in the situation where other macroeconomic stabilization policies are almost exhausted.[6] Indeed, there is a greater call among policymakers and academicians to evaluate the implications of modern capital controls. Several EMEs have adopted various administrative and market-based capital control measures in the post-GFC period.

[1] More specifically, the sensitivity of capital flows to global risk aversion and uncertainty has been unprecedented. Indeed, the post-GFC period is associated with intense fluctuations in capital mobility (Kaminsky, 2019).

[2] High capital mobility or financial globalization are very much costly that includes overheating problems, currency, banking and financial crises and unsustainable external imbalances and other contagion effects despite its benefits (Bhagwati, 1998; Calvo *et al*., 1996; Kaminsky and Reinhart, 1999; Reinhart and Calvo, 2000; Stiglitz, 2000; Stiglitz and Pike, 2004; Stiglitz *et al*., 2006; Reinhart, and Rogoff, 2009; Furceri *et al*., 2012; Kaminsky, 2019).

[3] Financial markets in EMEs include asymmetries in information, non-convex technologies, and incomplete markets that may reduce the benefits of high capital mobility (Stiglitz, 2010).

[4] For the detailed explanation on the limitation faced by various macroeconomic policies, see Prasad and Rajan (2008), and Kawai and Takagi (2010).

[5] Pecuniary externalities refer to deviations of equilibrium market prices like credit growth, asset prices and exchange rate that depends on borrowing decisions of private agents (Jeanne and Korinek, 2010a, 2010b; Dávila and Korinek, 2018).

[6] The institutional view of IMF includes capital controls and macroprudential regulations. Both policy measures have their respective objectives. While capital controls are residency based and target the financial transactions of both residents and non-residents, macroprudential regulations target the banking sector mainly (IMF, 2011a; 2011b; 2012a; 2012b).

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The motivation for the usage of capital controls in recent times is driven by the notion of pecuniary externalities. The phenomenon of over-borrowing by domestic private agents in foreign currency can be highly distortive. A set of theoretical literature talks vividly about the impact of the borrowing decisions of private agents on financial fragilities. Very often private agents borrowing behavior is associated with an excessive risk-taking tendency. In other words, they tend to take little insurance in their financial activities. Thus, the outcome is the over-borrowing of short-term foreign currency-denominated debt. This worsens their balance sheet problems and leads to financial amplifications (Aghion *et al*., 2000; Allen *et al*., 2002; Mendoza, 2002; Eichengreen *et al*., 2007; Mendoza, 2010; Al-Saffar *et al*., 2013). But the repercussions of financial amplification in the economy are tremendous. Several models on the financial amplification or accelerator mechanism reflect on the adverse spillover effects of a small negative disturbance.[7] The amplification of small shocks in an economy into much larger economic events are well discussed by Kiyotaki and Moore (1997), Bernanke *et al*. (1999), and Gertler and Kiyotaki (2010). Similarly, if the behavior of domestic agents is not internalized then an aggregate demand boom occurs in good times thereby economy becomes vulnerable in bad times. On the other hand, there is an existence of constraints on monetary policy (i.e., zero lower bound), fixed exchange rate, and costly fiscal adjustment which calls for capital controls in the management of aggregate demand (Farhi and Werning, 2016). Policymakers may be motivated to utilize capital control policies to improve domestic monetary conditions.[8] Also, domestic financial markets are full of imperfections. Liberalized financial markets in EMEs are associated with various forms of friction in terms of imperfect information, herding behavior, and moral hazard (Stiglitz, 2000, McKinnon and Pill, 1997).[9] Capital controls can be prudential and can provide stability and resilience to the domestic market. (Ulan, 2002; Gallagher *et al*., 2012). Also, it is effective in lengthening the maturity structure (Campion and Neumann, 2003; Neumann, 2006). Further, weak financial development in the presence of high capital mobility may be associated with unemployment in the short run and stagnant total factor productivity. Funds are used by unproductive firms due to imperfections. Capital controls can limit the aggravating impact of imperfections on resource allocation (Aoki *et al*., 2010).[10] Also, adverse selection further increases unproductive investment, and restrictions on inflows can be welfare-enhancing (Martin and Taddei, 2013). Thus, capital control tools are of great importance in the macro-financial policy toolkit.

[7] A close strand of literature also talks about the role of prices and financial constraints in affecting the financial instabilities (see for instance, Fisher, 1933; Bernanke and Gertler, 1989, 1995).

[8] There is a tradeoff between domestic objective and exchange rate management in the presence of high capital mobility or capital market openness (Mundell, 1963; Obstfeld and Taylor, 2005; Obstfeld *et al*., 2005; Goldberg, 2013; Klein and Shambaugh, 2015).

[9] These types of market imperfections can arise from several sources like presence of fixed costs of gathering and processing country specific information (Calvo and Mendoza, 2000), ex post bailout policy (Eichengreen and Hausmann,1999), the role of exchange rate regime in over borrowing and government incentive to raise foreign borrowing (McKinnon, 1999).

[10] But, another set of studies are skeptical about the positive implication of capital controls on resource allocation (see for example, Baker, 1996; Ostry *et al*., 2012b).

Our study is highly motivated by multiple factors. First, our study is motivated by the increasing usage of capital control policies across EMEs in recent times.[11] Second, the undertaking of our study is motivated by the institutional view of the IMF which suggests the utilization of capital controls under the conditions of less space for macroeconomic policies and country-wise domestic conditions. Third, the updated view of the IMF endorses the preemptive manner (e.g., use of capital controls even if there is an absence of surge in inflows) of imposition of capital controls on the debt flows (Korinek *et al*., 2022). Fourth, this study is motivated by the multilateral coordination of macro-financial policy toolkits. To tackle the currency wars, boom and bust of financial cycles, and other forms of instabilities capital controls are recommended by the IMF under some conditions. The change in the long-standing view of the IMF says that it has become more vocal for capital controls in the management of global financial structure and economic governance institutions. However, the endorsement of capital controls should be based on multilateral considerations (Eichengreen, 2013; Feibelman, 2014; Garcia, 2015; Dongming *et al*., 2017; Jeanne, 2021). In this context, the imposition of capital controls has cross-border implications. From a single-country perspective, capital controls can increase welfare in multiple ways. A series of literature on macroprudential management and macroeconomic management provides various justifications for capital control actions. According to IMF-FSB-BIS (2011), IMF (2020), and G20 (2011), certain capital control measures may respond to minimize financial crises in the form of ex-ante tools to limit the build-up of systemic risks. Another group of studies is related to the macroeconomic management of capital controls. They can be utilized against excessive exchange rate appreciation and overheating problems (Cordero and Montecino, 2010; Pradhan *et al*., 2011). Similarly, they are useful tools for reducing output volatility (Calvo *et al*., 1996; De Gregorio *et al*., 2000). Conversely, a sufficiently large country that has high pricing power can desire capital controls to manipulate the world rate of interest. If the country is a borrower, then to reduce domestic demand for the capital so as its cost, it can use its monopsonistic power to alter the world rate of interest or relative prices (Blanchard and Ostry, 2012; Ostry *et al*., 2012b; Costinot *et al*., 2014). But, from a multicounty perspective, capital controls by a single large country or a sufficiently small number of countries can have potential cross-border spillovers. The divergence of capital flows from one country to another country can take place. In the extreme scenario, disruption in global liquidity can arise. According to Jeanne (2014), deflection effects as creating a 'global capital war' has a potential distortion on global liquidity. In response to capital controls by some EMEs, other EMEs can follow a similar pattern of policies. In other words, 'capital controls arm race' (Korinek, 2012) and global policy coordination problems around the world (Ostry *et al*., 2012b; Korinek, 2020) can occur. Thus, it is important to understand the conditions under which the spillover effects of capital controls are welfare-enhancing or otherwise. Fifth, the motivation behind the study comes from the notion of 'Optimal Capital Controls'. The literature on the optimality of capital controls takes into account the domestic effects of capital controls. The multifaceted effects of capital controls can help policymakers and academicians to broaden

[11] For the trend in capital controls in EMES, see Appendix.

the theoretical construction of its optimality. Sixth, our motivation is concerned with the relative benefits and costs of capital controls. While assessing the costs of capital controls, along with the economic, efficiency, and administrative costs, the cross-border consequences should be taken into account by policymakers. Lastly, the COVID-19 outbreak is associated with the fall in global trade and has amplified external sustainability problems (Narayan, 2020; 2022; Vidya and Prabheesh, 2020; Padhan and Prabheesh, 2021; Prabheesh, 2022; Kumar and Prabheesh, 2023). So, there is a need for outflow controls to reduce exchange rate fluctuations and enhance external sustainability (Prates, 2021).

The spillovers of capital control broadly take place through the deflection effect. According to Erten *et al*. (2019) and Rebucci and Ma (2019), there are three spillovers of capital controls policy: (1) capital deflection effect, (2) abundance of global liquidity, and (3) policy response effect. But capital controls by capital-receiving countries can have other potential cross-border effects. First, they can create a capital depression effect. Second, they can magnify the state of business cycles in other countries. Third, they can play a huge role in disrupting macro-financial stability in other countries. Fourth, the capital market of EMEs can be vulnerable to financial shocks in Asian Economies (AEs). Fifth, they can reduce the monetary autonomy of other countries. Sixth, firm-level activities at a cross-border level can be affected. Finally, they may affect global output growth. So, we can ask several questions in this context: (1) what are the potential spillover effects of capital controls? (2) Do spillovers vary in the case of cross-country heterogeneity in terms of similar geographical regions, and similar economic characteristics? And is there any differential impact found in the pre- and post-GFC period, and is there an asymmetry associated with the direction of capital controls found by empirical studies? Furthermore, do spillover effects vary in the case of asset-specific capital controls and the composition of capital flows? (3) What are the welfare implications of spillovers of capital controls? In other words, are the spillover effects of capital controls necessarily Pareto inefficient, if yes then under what conditions do they distort the optimal global allocations?

Our approach in this study is as follows. First, we identify the key research questions by documenting the literature on the spillover effects of capital controls until now. Second, we provide a synthesis of the literature on spillovers of capital controls systematically. Here, we extend the studies of Erten *et al*. (2019) and Rebucci and Ma (2019), by including other spillovers like the capital depression effect, the amplification of cross-border business cycles, cross-border macro-financial fragilities, cross-country trilemma problems, the capital market covariance, the cross-border capital controls policy response effect, implications on the cross-border firm-level performance, and suboptimal global growth. Third, by analyzing the empirical literature, we explore the behavior of spillovers of capital controls in similar economies in terms of their geographical region and economic characteristics. Then, we extend the discussion by including the role of the direction of capital controls and the pre- and post-GFC period in the dynamics of spillover effects of capital controls. We also explore the spillover effect in the case of asset-specific capital controls and the composition of capital flows. Furthermore, we conduct a critical review of the welfare implications of capital controls. Finally, we suggest some future research directions on this issue.

Accordingly, we followed several steps: (1) Several published papers, working papers, columns, a blog, and edited books were identified related to the spillovers of capital controls. We obtained 16 published papers from *IMF Economic Review, Journal of International Economics, Journal of International Money and Finance, Journal of Political Economy, Pacific-Basin Finance Journal, American Economic Review, Central and Eastern Europe, Chicago Journal of International Law, Cogent Economics & Finance, Economic Annals, and SSRN*. Furthermore, we obtained 17 working papers from the National Bureau of Economic Research (NBER), IMF, Banque de France, Organisation for Economic Co-operation and Development (OECD), European Central Bank, Departamento de Economia, Rio de Janeiro, University of California, and University of Maryland. Also, we acquired two chapters from the books "Dealing with the Challenges Macro-Financial Linkages in Emerging Markets" (World bank publications) and "Who Needs to Open the Capital Account" (Peterson Institute for International Economics publication) respectively, three columns from VoxEU, Bretton woods Project and G20 insights and one blog report from Overseas Development Institute. This filtering technique can be attributed to the occurrence of the GFC which motivated prudential capital controls policy, associated problems in global capital controls policy coordination, and the theoretical arguments for improving the benefits of capital controls in a multilateral framework. (2) We synthesize both theoretical and empirical literature related to the spillover effects of capital controls. (3) We also broaden the scope of the study by discussing differential spillovers of capital controls by discussing the importance of geographical regions, similar economic characteristics, and direction of capital controls. Similarly, we focus on the role of the GFC in the extent of spillovers of capital controls policy. Furthermore, the role of asset-specific capital controls and the compositional effect of capital flows are explored in the context of capital controls spillovers. (4) Also, we cover the welfare implications of spillovers of capital controls. Finally, we identify the shortcomings of existing studies and propose future research directions.

The contribution of this study to the literature is manifold. First, this study is one of the first attempts to document the spillover effects of capital control policies. Second, this study extends the study of Erten *et al*. (2019) and Rebucci and Ma (2019) by covering other potential spillovers of capital controls such as the capital depression effect, the amplification of cross-border business cycles, cross-border macro-financial fragilities, cross-country trilemma problems, the capital market covariance, the cross-border capital controls policy response effect, implications on the cross-border firm-level performance, and suboptimal global growth. Specifically, we contribute to the literature by providing a detailed discussion of the context, theories, empirical studies, and methodologies related to the previous literature on the spillover effects of capital controls. Third, this study is the first attempt in addressing differentiated spillovers of capital controls in the case of cross-country heterogeneity in terms of geographical region, and country-wise economic characteristics. Also, this study extends the discussion by including the role of the GFC and the direction of capital controls in affecting its spillovers. Furthermore, we cover the role of asset-specific capital controls and the composition of capital flows in the degree of spillovers of capital controls policy. Fourth, this study is the first attempt to document the welfare implications of the

spillover effects of capital controls. Finally, this study is the first attempt to provide a future research agenda in this context.

The remainder of the paper is organized as follows. Section II presents the theoretical background of capital controls. Section III provides a brief discussion on various issues of capital controls. Section IV covers the synthesis of the theories and empirical literature on the spillover effects of capital controls. Section V discusses the welfare implications of the spillover effects of capital controls. Section VI discusses the limitations of existing literature and provides directions for future research. Finally, Section VII concludes and suggests some policy implications.

II. CONCEPT OF CAPITAL CONTROLS IN A NUTSHELL

A. Definition of Capital Control

Capital control is defined as legal rules, taxes, or fees on cross-border financial transactions (Organisation for Economic Co-operation and Development, 2009; IMF, 2013). Broadly, the restrictions on capital transactions can be direct or administrative and indirect or market-based.[12] Direct or administrative capital controls include various measures such as outright prohibitions, explicit quantitative limits, and rule-based or discretionary procedures related to the approval of transactions. These types of capital regulations aim to target the volume of cross-border capital flows directly via regulations in the banking sectors and other financial institutions. On the other hand, indirect or market-based capital controls include measures like dual or multiple exchange rate systems, different explicit or implicit taxation on financial flows[13] (Tobin tax), and price-based measures such as Unremunerated Reserve Requirements (URR). The market-based controls aim at discouraging capital movements by increasing their relative costs rather than directly affecting the capital movements. It is argued that the imposition of capital controls is discriminatory as cross-border financial transactions of residents and non-residents are treated differently. In other words, while inflow controls are imposed on the financial transactions of non-residents, outflow controls are imposed on the financial transactions of residents.

Erten *et al*. (2019) provide a much broader classification of the varieties of capital controls based on several dimensions. The capital flows are broadly divided into long-term flows and short-term flows which include portfolio flows, bank flows, etc. in terms of maturity. A distinction can be made on capital controls by looking at the fact that on which types of flows they are imposed in terms of maturity. Similarly, capital controls can be direction-based that include capital inflow and outflow controls. Capital controls can be market-based tools and administrative or discretionary measures. On the other hand, from the timing of imposition of

[12] Short-term capital flows are very much fickle subject to surge and sudden stop or reversal as driven by the sentiment of investors. So, this destabilizing nature can distort the smooth functioning of macroeconomic fundamentals. On the other hand, long-term flows have a strong relationship with the real economy and thereby provides greater stability and desirability. Various structural factors, macroeconomic fundamentals quality and liberalization of exchange transactions etc. determine the long-term external investment (Otker *et al*., 2000).

[13] This tax is like the 'Tobin Tax' which is proposed as uniform imposition of levy on forex transactions to discourage speculation in short-term foreign currency.

capital controls, it can be ex-ante and ex-post. They also can be structural and cyclical where cyclical measures are adjusted at the business cycle frequency.[14]

B. Benefits and Costs of Capital Control

Capital controls are associated with both several benefits and costs. According to Baker (1996) and Neely (1999), capital controls lead to the broadening of the tax base and adjusting the BOP problem, and sudden capital outflows. They also help in preventing currency appreciation. They can provide a shield to domestic financial sectors that feature a lack of strong regulation, herding behavior, and information asymmetry. Also, domestic savings can be protected with the use of these measures. A broad set of literature suggests that capital controls play a huge role in improving domestic monetary autonomy, thus, domestic policy flexibility (Mundell, 1963; Obstfeld and Taylor, 2005; Obstfeld *et al*., 2005). On the other hand, capital controls include several costs. Long-term capital controls can reduce the benefits of high capital mobility.[15] It can result in a technical loss in the form of suboptimal resource allocation in the presence of a weak regulatory framework. Similarly, it involves administrative costs, compliance costs for financial sectors, efficiency costs due to imperfect mechanisms involved in the target of risky flows, distortive effects on the consumption (excess savings), manipulation of terms-of-trade or world rate of interest (Ostry *et al*., 2012b). At times capital controls can affect FDI adversely (Asiedu and Lien, 2004). Capital controls are sometimes characterized as guilt by association (Bartolini and Drazen, 1996; Ghosh *et al*., 2020). In other words, they are persistent, that is if imposed then they tend to stay for a longer period. Similarly, once they are removed then it is very difficult to restore them. They can lead to a bad government, poor macroeconomic policies, and economic performance. They are pervasive and persistent, incompatible with trade integration (Ghosh *et al*., 2020). Historically, capital controls have been used for various purposes; generation of revenue, adjustment of BOP deficits, capital flow management, currency management, and preservation of savings for domestic use and safeguarding the domestic firms and sectors (Neely, 1999).

C. Approaches Towards the Capital Control

There are two key approaches towards capital control, i.e., institutional and pragmatic. The institutional approach is given by the IMF, which suggests that controls is the second-best policy in the presence of pecuniary externalities. The macroeconomic policies should be the primary policies that include exchange rate adjustment policy, monetary policy, sterilization, compatible fiscal policy, and well-supervised financial system to minimize the instabilities caused by large and volatile capital flows. Further, capital control measures should not substitute

[14] For the detailed discussion on the types of capital controls, refer Erten *et al*. (2019).

[15] The benefits of high capital mobility are productive efficiency, financing of current account deficit, intertemporal consumption smoothing, international risk sharing, reduction in the cost of capital, higher discipline effect, greater institutional quality (Obstfeld, 1994; Obstfeld and Rogoff,1995; Bartolini and Drazen, 1996; Stiglitz, 2000).

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macroeconomic policies (IMF, 2011a; 2011b; 2012a; 2012b; 2018a). This set of views addresses under specific circumstances short-run capital controls to be adopted.[16]

On the other hand, the pragmatic approach proposed by Gochoco-Bautista and Rhee (2012) underscores the need for capital control based on the Current Account (CA) balance of an economy. According to this approach, the imposition of capital controls is not suggested until a country experiences a CA deficit and its international currency reserves are depleted to zero. As per this approach, as long as the CA surplus is large and persistent, the use of capital controls is not judicious. Table 1 shows the various scenarios of CA imbalances and currency reserve position that recommend for capital controls as per this approach.

Table 1.
Pragmatic Approach for the Utilization of Capital Controls

This table presents the use of capital control measures under different CA, capital flows, and reserve circumstances. Under the circumstances of CA surplus, positive or negative capital inflows, and positive or zero accumulation of reserves, capital controls are not needed. Rather, policymakers should emphasize the financial sector supervision. On the other hand, only in the scenario of a large CA deficit, large capital outflows, and negative reserve, capital controls are warranted. Note: The notations > and < refer to positive and negative CA balance, capital flows, and accumulation of reserves respectively. The notations >> and << refer to very large positive and negative CA balance, capital flows, and accumulation of reserves respectively.

CA Balance	Gross Capital Inflows	Accumulation of Reserves	Use of Capital Control Measures
Surplus (>>0)	Inflows (>>0 or >0)	>>0	Capital controls are not needed as the country's external sector is strong.
Surplus (>>0)	Outflows (<<0)	=0	Capital controls are still unwarranted. Rather, supervision of financial sectors is welcome to minimize the excessive risk-taking and channelization of resources to safe investment thereby ensuring financial stability.
Deficit (<<0)	Outflows (>>0)	=0	Controls may or may not be needed depending on the degree of volatility of the capital inflows and the source of deficits (whether the deficits arise due to an unsustainable consumption boom or investments where investments would lead to better macroeconomic fundamentals).
Deficit (<<0)	Inflows or outflows (>0 or <0)	<<0	Capital controls are warranted because of the existence of the crisis situation in terms of severe external sector unsustainability.
Balanced (=0)	Inflows (>>0)	>>0	A scenario of balanced CA, but the fear of currency appreciation due to short-term debt inflows. So, capital controls are needed to manage financial instability.
Balanced (=0)	Outflows (<<0)	<<0	A scenario of balanced CA, but the fear of currency depreciation due to short-term debt outflows. So, utilization of Capital controls for financial stability reasons.

Source: Gochoco-Bautista and Rhee (2012).

[16] The circumstances include currency reserves over and above an adequate level, economy is at a near potential and less space for standard macroeconomic stabilization policies such as the exchange rate, fiscal, and monetary policy.

D. Evolution of Capital Controls

This section ends with a brief review of the evolution of capital controls. Various studies on capital account (KA) liberalization and capital mobility discuss the historical background of capital controls in the 20th century (Quinn, 2003; Obstfeld and Taylor, 1997; Krugman and Obstfeld, 2009). Ghosh *et al*. (2020) present the evolution of controls considering five periods such as the gold standard, the inter-war period, the Bretton-Woods system, Free-floating, and the Aftermath of GFC. The gold standard is associated with relatively high capital mobility due to low currency risk and exchange rate volatility. In other words, there were almost zero restrictions on cross-border capital mobility. A significant amount of capital was exported from major industrialized countries like Britain, Germany, and France. However, during the inter-war period, policymakers became compelled to impose some exchange restrictions, and capital controls to avoid uncertainty (League of Nations, 1938; Ellis, 1946). Further, capital controls were persistent throughout the entire period of the Bretton-Woods system to solve the problem of the trilemma to focus on domestic objectives.[17]

The collapse of Bretton Woods, the increasing BoP problem around the globe, and the Washington consensus played a huge role in the dismantling of capital controls in the 1980s and early 1990s. But, with the East Asian and Latin American crises, some policymakers became vocal about capital control in the late 1990s (Bhagwati, 1998; Rodrik, 1998). Several market-based controls that include taxation on inflows, open position limits, reporting requirements, asymmetric open position limits, etc. were employed on the short-term inflows along with macroeconomic measures in Brazil, Chile, Colombia, Thailand, and Malaysia in the 1990s (Otker, *et al*., 2000). Various factors motivated the imposition of capital controls in these countries. They are the preservation of domestic monetary autonomy, reduction in sterilization costs, and prudential motive. On the other hand, to limit currency depreciation capital outflow controls were adopted by Spain, Thailand, and Malaysia. The measures targeted the nonresidents' (speculator) activities related to financial transactions.[18] Also, Ukraine, Russia, and Slovenia adopted capital controls. The occurrence of the GFC resulted in high volatility in capital flows, exchange rates, etc. Therefore, several market-based controls were imposed by Brazil, Indonesia, South Korea, South Africa, Thailand, Turkey, and Peru during the GFC period and its subsequent periods (IMF, 2011b). In response to outflows, Argentina, Thailand, Malaysia, and Iceland undertook various market-based and administrative outflow restriction measures (IMF, 2012b). Also, Greece, Cyprus, China, and India have imposed capital controls on certain financial transactions in recent times (Zehri, 2022). Further, the usage of administrative capital controls more in the case of Asian countries than in Latin American countries (Pasricha *et al*., 2015). On the other hand, Latin American countries are more active in utilizing market-based controls. Indeed, the post-GFC period is associated with a higher level of inflow and outflow controls on various asset categories across EMEs

[17] Papers that discuss the concept of trilemma are Mundell (1963), Obstfeld and Taylor (2005), Obstfeld *et al*. (2005), Goldberg (2013).

[18] Certain portfolio investments, FDI, and other international transactions were exempted from the set of regulations.

(Schindler, 2009; Fernández *et al*., 2016).[19] However, capital outflow controls are more prevalent than inflow controls across asset categories.

III. EXISTING LITERATURE: WHERE DOES IT STAND?

There is a plethora of literature on capital controls, reflecting the increasing importance of capital controls in the global economy. To understand the present survey in a broader context, it is important to categorize different issues of capital controls: (1) measurement, (2) determinants, (3) effectiveness, (4) firm-level implications, and (5) spillover effects.

The first area of literature is concerned with the intensity of capital control indicators. Broadly, there are two categories of capital control measurement: de jure and de facto. The de jure indicators are based on The Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) and reflect the legal restrictions on different flows.[20] However, the extent of enforcement is not present in these indicators. Some of the de jure indicators are Schindler (2009), Klein (2012), and Fernández *et al*. (2015). On the other hand, de facto indicators that show the actual level of enforcement consist of the sum of gross foreign assets and liabilities as a share of domestic output or the deviation from covered interest rate parity (Hutchison *et al*., 2012; Rodrik and Subramanian, 2009). However, it suffers from various limitations: (1) it is based on the efficient market hypothesis, (2) it requires assumptions on investors' preferences and expectations, and (3) it is derived from the interaction between interactions of policy changes and market forces. Thus, the de jure indicators are used as the representatives of capital controls in the empirical studies to show the degree of changes in policy in an exogenous manner.

The second area of literature is related to the various factors that affect capital control decisions in a country. Several policy motivations such as macroprudential management (IMF-FSB-BIS, 2011; IMF, 2020), macroeconomic management (Cordero and Montecino, 2010; Pradhan *et al*., 2011), and terms-of-trade manipulation objective (Costinot *et al*., 2014) can determine capital controls. The structural and political characteristics of an economy that include domestic financial depth and development, the strength of democratic checks and balances, and the quality of regulatory institutions also affect capital controls (Eichengreen and Rose, 2014). The policy regimes like Inflation Targeting (IT) regimes and non-IT regimes, flexible and fixed exchange rate regimes also matter for capital controls policy (Fratzscher, 2012; Binici and Das, 2021).

[19] However, a group of economists are skeptical because of its limited effectiveness and associated costs of capital controls (Caruana, 2011; Olson and Kim, 2013; De Gregorio, 2014).

[20] AREAER covers the exchange rate and trade regimes of all member countries. It includes controls on CA, KA transactions, multiple exchange rate regimes and requirement of surrendering of exports proceedings. Broadly, there are two types of AREAER; aggregate or pre-1996 edition and disaggregate or post-1996 edition. Aggregate AREAER does not include individual assets under KA transactions. So, it does not provide adequate intensity of controls. But, disaggregate AREAER includes asset specific restrictions thus provides better intensity where assets are portfolio transactions, bond flows, foreign currency credit, collective investment, liquidation of FDI etc.

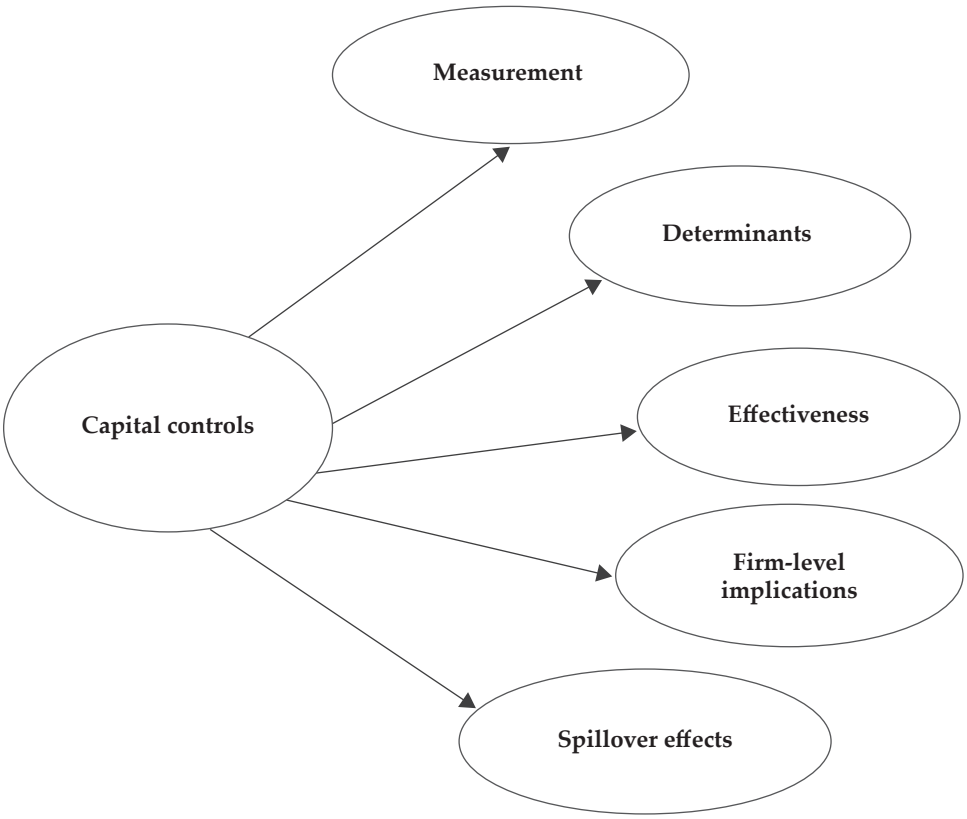
The third area of literature is associated with the effectiveness of capital controls on the volume and composition of capital flows, management of exchange rate fluctuations, monetary autonomy, and financial instability. According to Magud and Reinhart (2006) and Magud *et al*. (2011), controls on capital movements are required to achieve following five objectives: (i) to reduce the volume and alter the composition of capital flows, (ii) to limit exchange rate appreciation, (iii) to maintain exchange rate stability, (iv) to achieve higher monetary independence, and (v) to minimize the likelihood of financial crisis. Several surveys and empirical studies document that capital controls are more effective in altering the maturity structure of investment inflows and providing greater monetary autonomy than the other objectives (Valdés-Prieto and Soto,1998; Montiel and Reinhart, 1999; De Gregorio *et al*., 2000; Inoguchi, 2009; Rincon and Cordoba, 2010; Magud *et al*., 2011; Jinjarak *et al*., 2013; Van der Laan *et al*., 2017).

The fourth area of study focuses on the firm-level or micro-level impact of capital controls. The imposition of capital controls is associated with a higher level of financial constraints in the case of Chilean firms (Forbes, 2007). Similarly, Alfaro *et al*. (2017) find that an increase in the cost of capital, a fall in cumulative abnormal returns of stocks, and real investment at the firm-level are the consequences of capital controls.

This study tries to avoid the discussion of the first four areas of literature and focuses on the existing surveys to provide a systematic framework for the literature surveys of it.[21] However, the interrelation between these areas of study is fluid. The literature on spillovers of capital controls has some policy implications for other areas of literature. Before undertaking capital control regulations and assessing their intensity, effectiveness, and firm-level impact policymakers should give weightage to their spillover effects. Figure 1 illustrates various issues related to capital controls.

[21] Erten *et al*. (2019) provide a study on the measurement and effectiveness of capital controls. Similarly, Rebucci and Ma (2019) provide a brief review on its firm-level impact. However, there is no availability of a survey on the determinants of capital controls.

Figure 1.
A Stylized Illustration of Major Research Areas of Capital Controls
This figure illustrates various issues related to capital controls that include the measurement, determinants, effectiveness, firm-level implications, and spillover effects of capital controls.



Source: Author's illustration.

IV. SPILLOVER EFFECTS OF CAPITAL CONTROLS: A CRITICAL REVIEW OF THE THEORETICAL AND EMPIRICAL LITERATURE

This section reviews the theoretical and empirical studies on spillover or cross-border effects of capital control policies. Evidence suggests that capital-receiving countries adopt capital control policies to maintain the financial stability associated with global capital flow movements. As a result of the capital control activities, there can be a divergence or deflection of financial flows from the capital control imposing country to the other financially open countries, due to the excess global liquidity and weak demand for global capital. This deflection of capital flows often creates financial instabilities in the other capital-receiving countries, such as pressure on exchange rate appreciation, and weak monetary policy autonomy, which in turn induce these countries to adopt similar capital control policies, and often ends up with weak global policy coordination. Thus, the capital control actions of one country alter the global capital movements and may result in 'capital controls arm race', 'global capital war' and 'currency war' situations (Korinek, 2012; Jeanne, 2014; Blanchard, 2021).

As countries adopt capital control on inflows and outflows of foreign capital, the spillover effect varies based on the nature of these controls. In the following subsections, we review the studies on the spillover effects of inflow and outflow capital control.

A. Spillover Effects of Inflow Capital Controls

There are various spillover effects associated with capital inflow controls. These are the deflection effect, the amplification of cross-border business cycles, cross-border macro-financial fragilities, cross-country trilemma problems, the capital market covariance among countries, and the multilateral capital controls policy response effect, the capital depression effect, and the abundance of global liquidity.

A.I. Capital Deflection Effect[22]

One of the key impacts of capital control actions of the capital-receiving countries is the deflation effect. It is argued that the source countries' policies such as monetary policy, prudential regulations, and other forms of regulations can transmit macro-financial risks and domestic policy challenges to the capital-receiving countries through the outflow of several risky financial capital. So, a set of latter countries may tend to impose capital inflow controls. The controls that reduce the overall volume of capital flows in the domestic economy can deflect certain capital flows to other countries (IMF, 2011a; Ostry *et al*., 2010; Ostry *et al*., 2011b; Blanchard and Ostry, 2012). Giordani *et al*. (2017) show the deflection effect in a more detailed manner by developing an intertemporal theoretical model that includes two time periods, and a set of multi countries. However, the degree of deflection effect is dependent upon the size of the capital-receiving country. In other words, a larger (smaller) level of capital deflection takes place as a result of inflow controls by large (small) countries. The deflection effect is well-established in empirical studies. Lambert *et al*. (2011) find strong evidence of the deflection effect in the context of six Latin American countries over the period 2004-2011. Forbes *et al*. (2016) find the evidence of deflection effect in the case of 30 EMEs during the period 2005-2013. Several other studies like IMF (2011b), Beirne and Friedrich (2014), Ghosh *et al*. (2014), Pasricha *et al*. (2015), Boero *et al*. (2019), Pasricha *et al*. (2018), Cerutti and Zhou (2018), Gori *et al*. (2020), Zehri (2020a, 2020b, 2020c), and Sanyal (2020, 2022) also find the presence of deflection effect. However, Boero *et al*. (2019) find limited evidence on the deflection effect. IMF (2011b) finds that the deflection effect of capital controls is heterogeneous across countries. considering one-day market reactions, capital flow management measures (CFMs) in Brazil are associated with a reduction in domestic asset prices and currency depreciation in Brazil but an increase in equity returns in Mexico and Chile suggesting a diversion of flows. Similarly, market-based policy measures like Unremunerated Reserve Requirements (URR) in Colombia have a diversion effect to Chile. Also, URR in

[22] Similarly, in the case of literature on international trade the "deflection" is known as trade deflection. Bown and Crowley (2006) introduced this term and opined that it is a situation where there is change in export destinations in response to a rise in the trade barrier in another destination.

Thailand has a deflection effect on Indonesia, Korea, Malaysia, and the Philippines. On the other hand, the reduction of capital inflows to Brazil, Mexico, and Peru in response to capital controls in Colombia suggests that investors' perception tends toward higher-level controls in these countries. Sanyal (2022) finds evidence of the deflection effect at the sectoral level that consists of public, bank, and corporate institutions. According to Beirne and Friedrich (2014), deflection is more prevalent in countries that depend on foreign bank flows.

A. II. Cross-border Business Cycle Implications

In a framework of the real business cycle that consists of one AE and two EMEs, Landi (2020) analyzes the impact of capital controls by one EME in affecting the business cycle of the other EME. If the push-factor shock from the AE is followed by the tightening of capital controls in one EME (EME1), another EME (say, EME2) may realize large capital inflows, in turn, realizes adverse impacts on its Net Foreign Asset position (NFA) and exchange rate. Furthermore, it may experience additional waves of consumption and investment, thereby the business cycle. However, this analysis is based on the assumption that the exogenous risk-premium shocks or changes in global interest rate, more specifically negative risk-premium shocks drive the capital inflows in the EMEs.

A.III. Cross-border Macro-financial Fragilities

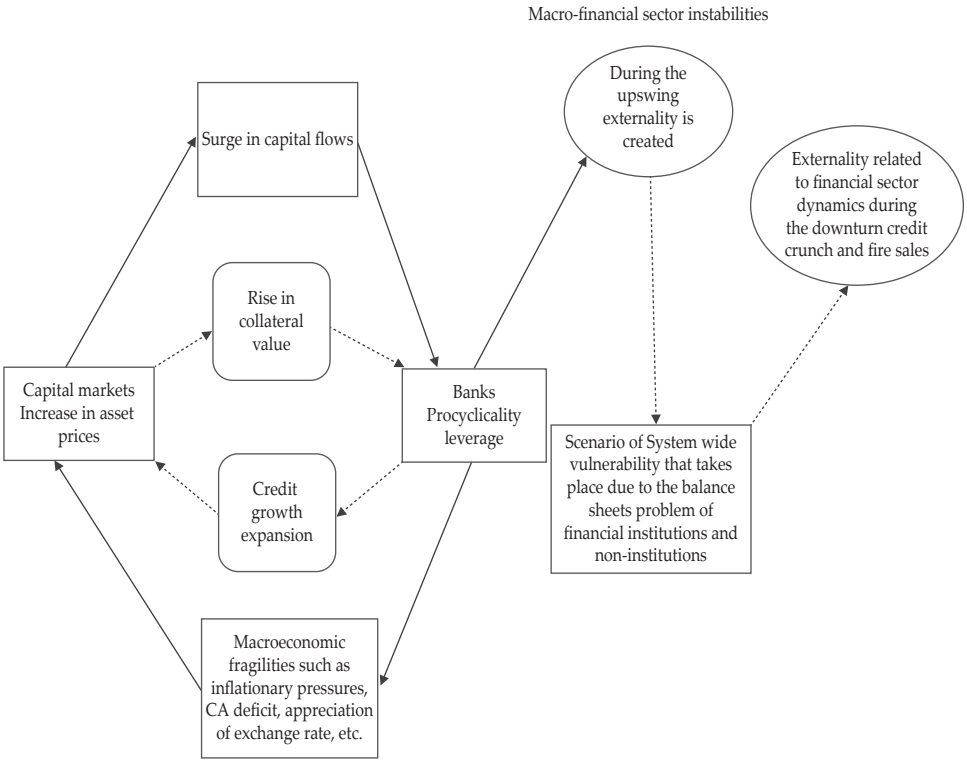
The capital inflow controls by the capital-receiving countries can affect the macro-financial conditions in other countries such as pressure on exchange rate appreciation, and overheating problem, etc. (Ostry *et al*., 2012b; Korinek, 2020). Zehri (2020b) finds significant spillover effects of capital controls on cross-border exchange rates. The study of Classens and Ghosh (2013) provides how capital inflow controls can result in periods of large and volatile capital flows. The flows that are intermediated through the banking system have a greater potential to amplify the financial cycle. Also, in the presence of weak structural characteristics (as the EMEs financial sector is largely dominated by the banking system), the capital inflows can increase asset prices and credit growth thereby can create a systemic risk problem. Furthermore, weak institutional quality (weak legal regimes, enforcement, less track record), weak market discipline (as it gives lower information disclosure and transparency), and greater prevalence of insider-type corporate governance arrangements can lead to the loss of investors' confidence when a minor shock happens (Classens and Ghosh, 2013). Therefore, large capital inflows can amplify the business and financial cycle procyclicality.[23] Figure 2 shows various macro-financial fragilities associated with periods of large capital inflows. The large financial inflows can create overheating problems, CA pressure,

[23] The procyclical tendency of business and financial cycles is well documented in the following literature; role of financial frictions (Brunnermeier *et al*., 2009), demand side factors (behavior of borrower that arise from borrower's balance sheet and income) and supply side factors (behavior of financial institutions and market) (see Classens and Ghosh, 2013).

appreciation of the exchange rate, etc. Similarly, the associated financial instabilities as an abnormal growth in credit growth, housing price, and asset price.[24]

Figure 2.
Macro-financial Instabilities Associated with Large Capital Inflows

This figure explains various macro-financial fragilities associated with periods of large capital inflows like overheating problems, CA pressure, appreciation of the exchange rate, etc. Similarly, the associated financial instabilities can be abnormal credit growth in credit growth, housing prices, and asset prices.



Source: Claessens and Ghosh (2013).

A. IV. Capital Depression Effect

Inflow controls often end up with capital depression among capital-receiving countries. This is mainly due to an increase in the cost of capital in these economies due to capital control, which passes an adverse signal to global investors about the

[24] The systemic or system-wide risks which reflect the financial instability of an economy can be created by large and volatile capital flows through various channels. By putting upward pressure on the exchange rate and other asset prices, the inflow surge can result in an increase in the value of collateral, thus increasing the economic agents' lending and borrowing capacity through the financial accelerator mechanism (Kiyotaki and Moore, 1997; Cesa-Bianchi *et al*., 2018). Further, capital inflow surges are associated with the rise in cross-border non-core liabilities, excessive credit growth, build-up maturity and currency mismatches (Hahm *et al*., 2013), and an increase in the gross debt positions (Acharya and Schnabl, 2010). There are broadly five different channels such as huge credit growth, asset price booms, the existence of exposure to unhedged foreign currency, interconnectedness, and non-core funding of the banking system via which systematic risk can result from excessive capital inflows.

macroeconomic conditions and thereby discourages global investments. In other words, this depression in the global demand for financial capital leads to a fall in the magnitude of capital inflows in this set of countries (Giordani *et al*., 2017). Chantapacdepong and Shim (2015) find evidence of the low level of bond inflows in the case of 12 countries in the Asia-Pacific region as a response to inflow capital controls.

A.V. Abundance of Global Liquidity

Another impact of inflow control is the abundance or surplus of global liquidity due to low demand for capital. The evidence suggests that during the post-GFC period, many EMEs adopted capital inflow control which increased global liquidity. For instance, Pasricha *et al*. (2018) found that tightening restrictions on capital inflows by 16 EMEs during post-GFC increases liquidity at the global level.

A.VI. Cross-country Trilemma Problems

Pasricha *et al*. (2015, 2018) find evidence of cross-border monetary policy autonomy problem as a consequence of capital control actions. Although inflow capital controls improve the conditions of domestic monetary policy autonomy, these policies may potentially reduce the monetary autonomy in the multilateral framework. The study finds that capital controls in BRIC economies affect the monetary autonomy of other countries by deflecting both gross and net capital flows.

A.VII. Capital Market Co-movement Among Countries

Theoretically, Fan *et al*. (2020) explore the cross-border impact of capital controls on the capital market co-movement between capital-source and capital-receiving countries. The capital inflow controls in the capital-receiving countries can increase the co-movement of the capital markets of other capital-receiving countries to the capital markets of capital-source countries via the deflection effect. So, the sensitivity of capital markets in the former countries with the capital markets of the latter countries tends to increase. Furthermore, this strong capital market co-movement can amplify the contagion of risks from global financial shocks to capital-receiving countries. Empirically, the authors find strong and significant evidence of the co-movement of the capital markets between AEs and EMEs. So, the capital markets of EMEs become highly responsive to global financial shocks.

A. VIII. Policy Response Effect

The capital inflow controls may act as a beggar-thy-neighbor policy (Ostry *et al*., 2011b). The inflow controls may affect cross-border domestic macro-financial vulnerabilities like overheating problems, exchange rate appreciation, CA pressure, etc. So, countries may adopt the same kind of capital control policies. The spillover effect of capital inflow controls on the policy response is well analyzed by Giordani *et al*. (2017). The capital control actions of certain countries

may induce policy responses from other countries. However, the relative size of the country determines the behavior of capital control actions. Small countries will impose inflow controls during times of high foreign currency borrowing due to macroprudential management.[25] Hence, the capital controls policy becomes prudential and unambiguous. However, when large countries impose capital controls then it can affect the world rate of interest or intertemporal terms of trade due to their monopsonistic power. They not only consider the policies of other countries but also take into account their domestic policies. Also, the controls become complementary when the supply of capital from the rest of the world is highly rigid and become substitutes when the demand for capital becomes rigid. Further, Costinot *et al*. (2014) theoretically explore that when countries do not take into account the effect of their optimal capital controls on other similar countries, capital control wars arise due to retaliation by the countries. Several empirical studies such as Pasricha *et al*. (2018), Giordani *et al*. (2017), Zeheri (2020a; 2020b; and 2020c) explore the policy response of capital-receiving countries in the context of inflow controls. However, Giordani *et al*. (2017) find limited evidence on the policy response effect.

B. Spillover Effects of Outflow Controls

As per the literature, capital outflows produce various repercussions such as policy responses effect from other countries, reduction in firm-level performance, and suboptimal global growth.

B.I. Policy Response Effect

The spillover effects of capital outflow controls can induce a similar pattern of capital control policies (Marques *et al*., 2021). In the circumstances of a global liquidity shortage or credit constraint like COVID-19, some countries may impose outflow controls and these actions in turn gives a signal of uncertainty to global investors. Due to these uncertainties, global investors tend to pull out funds from other countries that have not taken such policy measures. This leads to massive capital outflows. As a result, other countries may incline to impose a similar pattern of capital controls to reduce capital flight.

B. II. Reduction in Firm-level Performance and Suboptimal Global Output Growth

It is argued that capital outflow control affects the firm's performance and global growth. For instance, according to Marques *et al*. (2021), there are two channels through which capital outflow controls can adversely affect firm-level activities. First, capital outflow controls in one or several countries can result in a fear of uncertainty, and outflow controls subsequently in other countries. So, firms cannot directly access credit smoothly which impediments their operations. Second, outflow controls put a negative effect on the balance sheet and risk-absorptive

[25] However, some credit constraint countries may not restrict capital inflows due to the positive externality associated with foreign financing.

capacity of global financial intermediaries and investors. So, firms' activity is hampered due to disruption in their financing channel. Due to the reduction in the firms' activities, global output growth becomes sub-optimal.

C. Empirical Studies on the Spillover Effects of Capital Controls: An Overview

The empirical studies on the spillovers of capital controls mostly focus on the deflection effect. Also, the empirical studies have explored several other effects such as an abundance of global liquidity, cross-border monetary policy autonomy, capital market-covariance between EMES and AEs, and policy response effect. The empirical studies largely focused on addressing the following questions: Are spillovers of capital controls heterogeneous in geographical regions and country-wise economic characteristics? Also, does the direction of controls have a different effect on the spillovers of capital controls? Has the aftermath of the GFC amplified the spillover effects?

C.I. Geographical Region vs Macroeconomic and Structural Characteristics

The existing empirical papers explore the spillovers of capital controls taking similar economies that include the same geographical region and similar economic characteristics. Lambert *et al*. (2011) find tightening inflow controls on bond flows in Brazil divert bond flows and to a lesser extent equity flows to other Latin American countries such as Argentina, Chile, Colombia, Mexico, and Peru. These countries are similar because they belong to the same region. IMF (2011b) also finds the existence of deflection in the same geographical region. The diversion of flows in response to capital controls in CFMs in Brazil takes place in Mexico and Chile. Similarly, Colombia's URR has a diversion effect to Chile. Also, URR in Thailand has a deflection effect on Indonesia, Korea, Malaysia, and the Philippines. These initial studies on capital controls spillovers find evidence that the deflection effect of capital controls takes place in the same geographical region.

On the other hand, a large number of empirical studies suggest that the spillover effects of capital controls are realized in similar economies. In other words, capital controls spillovers are higher in those countries that have similar market characteristics and follow less intense capital controls. The empirical findings of Forbes *et al*. (2016) suggest that capital inflow controls in Brazil deflect the capital flows to those economies that share similar market characteristics and have significant exposure to China and not to the gate countries (countries where the likelihood of controls is higher). The study by Giordani *et al*. (2017) also reflects the deflection of capital flows takes place in countries with similar economic characteristics (export specialization, return, and risk) and not in countries in the same region.

Pasricha *et al*. (2015) try to explore the spillovers of capital controls on inflows and outflows on the deflection effect and the trilemma. They find that the spillovers of capital control actions of BRICs are less prevalent in Asian countries than in Latin American countries. This suggests that AEs are more financially closed than Latin American economies. Also, controls lead to strong co-movement of the capital market of similar EMEs (that characterizes similar market size, region,

trade openness, market risks, and return) with that of AEs (Fan *et al*., 2020). From the above findings, it seems that the spillovers tend to take place more in countries with similar characteristics and countries where there is less likelihood of capital controls and share similar macroeconomic and structural characteristics than in a similar geographical region.

C.II. Role of Post-GFC, the Direction of Capital Controls, Asset-specific Capital Controls, and Compositional Effect of Capital Flows

The empirical studies also reveal the nature of spillovers in the pre-and post-GFC periods. Pasricha *et al*. (2015) find significant spillovers of capital controls in the aftermath of GFC than in the pre-crisis period. Similarly, Giordani *et al*. (2017) suggest that the policy response is not very evident during the pre-crisis period. They discuss three possible arguments for the justification; first, the level of capital controls does not reveal the actual intensity of capital controls. Second, during the pre-crisis period, capital controls are perceived as policy tools during periods of uncertainty. So, policymakers may be reluctant to impose restrictions on capital flows. Third, prudential controls might be less used than other tools in the pre-GFC period.

There are also asymmetric spillovers of capital control policy. The study by Pasricha *et al*. (2015) documents that the effects of the tightening of capital inflow controls are more than the easing of capital outflow controls. Similarly, the deflection effect takes place due to capital inflow controls and not due to capital outflow controls (Fan *et al*., 2020). Similarly, Gori *et al*. (2020) find evidence that the tightening of inflow capital controls leads to the likelihood of similar types of capital controls in the EMEs.

Gori *et al*. (2020) provide the first evidence of the importance of the compositional effect of capital flows in the context of the deflection effect of capital controls. Further, they explore the deflection effect of the asset-specific capital controls that cover the restrictions that target portfolio investment (debt and equity), credit, and FDI. The findings suggest that the deflection effect is significant in the case of short-term capital inflows or hot money. Because hot money, especially credit and portfolio investment, as more volatile tend to be highly deflected due to capital inflow controls. On the other hand, the deflection effect of FDI in response to inflow controls is the least as FDI flows are directed due to the fundamental and structural characteristics of the economy. Also, the inflow controls related to the short-term capital flows only result in capital flow deflection.

Table 2.
The Empirical Literature on Capital Controls Spillovers

This table presents a summary of all the existing empirical studies on capital controls spillovers. Note: IOF=Imposto Sobre Operações Financeiras; CFMS=Capital flow management measures; IV=Instrumental variables estimation; 2SLS=Two-Stage least squares; VAR=Vector autoregression; FE=Fixed effects.

Studies	Countries and Sample Period	Capital Controls Measurement	Methodology	Spillover Results	Spillover Effects/ Remarks
Lambert *et al*. (2011)	6 Latin American countries, 2004m1-2011m6	IOF	VAR	Positive	Deflection effect in the case of portfolio flows
IMF (2011b)	5 Latin American and 5 Asian economies, 2003m1 – 2011m9	CFMs	Event Study	Both positive and negative impacts. Considerable variation in the spillover impact of CFMs	Impact on equity returns and equity fund inflows of other countries
Beirne and Friedrich (2014)	139 countries, 1999-2009	Qureshi *et al*. (2012)	FE	Both significant and insignificant depending upon the share of non-resident bank loan	Capital flow diversion
Ghosh *et al*. (2014)	36 AEs and 76 EMEs, 1995-2012	Ghosh *et al*. (2014)	Gravity model, sensitivity analysis and IV-2SLS	Significant effect	Volume and deflection effect of cross-border bank flows
Chantapacdepng and Shim (2015)	12 Asian-Pacific economies, 2005 M9- 2013 M10	Chantapacdepog and Shim (2015)	Panel regression, event study	Variation in the effect on the correlation of bond inflows with respect to tightening and loosening of bond flow management measures	Correlation of Capital (bond) inflows and returns
Pasricha *et al*. (2015)	17 EMEs, 2001Q1-2011Q4	Pasricha *et al*. (2015) and Schindler (2009)	Panel near-VAR	Positive	Deflection effect and elements of the trinity

Table 2.
The Empirical Literature on Capital Controls Spillovers (Continued)

Studies	Countries and Sample Period	Capital Controls Measurement	Methodology	Spillover Results	Spillover Effects/ Remarks
Forbes *et al*. (2016)	30 EMEs, 2005m1-2013m12	IOF	FE	Positive	The shift of cross-border portfolio allocation of investors
Giordani *et al*. (2017)	78 less industrialized countries and EMEs, 1995-2009	Fernández *et al*. (2016), Schindler (2009) and Ostry *et al*. (2012)	Probit model, Panel push-pull framework, IV estimation	Positive and negative	Deflection and policy response effect
Cerutti and Zhou (2018)	29 countries, 2006-2015	Fernández *et al*. (2016)	Structural gravity approach	Significant effect in the case of capital borrowing countries.	Deflection effect with respect to cross-border bank flows
Boero *et al*. (2018)	42 countries, 1988Q4-2010Q4	Edison and Warnock (2003), Chinn-Ito (2008) and Fernández *et al*. (2016)	Global VAR, sensitivity analysis	Limited	Deflection effect
Pasricha *et al*. (2018)	16 EMEs, 2001Q1-2012Q4	Pasricha *et al*. (2015)	Structural near-VAR	Positive	Deflection effect, elements of cross-border monetary policy autonomy
Fan *et al*. (2020)	19 EMEs, 2001-2015	High-frequency similarity weighted average Capital control (SWACC) index	FE	Positive	Co-movement of the capital market between EMEs and AEs
Gori *et al*. (2020)	14 EMEs, 2000Q1-2017Q4	Lepers and Mehigan (2019)	FE	Mixed in the case of deflection effect and positive in the case of policy	Deflection effect at disaggregate level of capital flows, and policy response effect
Sanyal (2020)	23 EMEs, 1996Q1-2019Q4	Chinn-Ito Index (2008) and Updated Fernández *et al*. (2016)	Spatial regression	Positive	Deflection effect

Table 2.
The Empirical Literature on Capital Controls Spillovers (Continued)

Studies	Countries and Sample Period	Capital Controls Measurement	Methodology	Spillover Results	Spillover Effects/ Remarks
Zeheri (2020a)	24 EMEs, 2009Q1-2016Q4	Updated Fernández *et al*. (2016) and Chinn and Ito (2008)	Panel VAR	Positive	Deflection effect, implication on the cross-border exchange rate, and policy response effect
Zehri (2020b)	27 EMEs, 2010Q1-2018Q4	Updated Fernández *et al*. (2016) and Chinn and Ito (2008)	Panel VAR	Positive	Deflection effect, implication on the cross-border exchange rate and interest rate differential and policy response effect
Zehri (2020c)	25 Asian and Latin American countries, 2000Q1-2019Q4	Updated Fernández *et al*. (2016) and Chinn and Ito (2008)	Panel VAR	Positive	Deflection effect
Sanyal (2022)	20 EMES, 1997Q1-2018Q4	Chinn-Ito Index (2008) and Updated Fernández *et al*. (2016)	Spatial Durbin Model	Positive	Heterogeneous deflection effect at the sectoral level that consists of public, bank and corporate

Source: Author's compilation.

D. Key Takeaways

Several takeaways can be drawn from the synthesis of the theoretical and empirical literature on the spillover effects of capital controls. First, there are differential spillover effects of controls on capital inflows and outflows. The inflow controls are associated with the capital depression effect, the abundance of global liquidity, the deflection effect, the amplification of cross-border business cycles, cross-border macro-financial fragilities, cross-country trilemma problems, the capital market covariance among countries, and the multilateral capital controls policy response effect. Similarly, the outflow controls are associated with a similar policy response effect, a reduction in firm-level performance, and suboptimal global growth.

Second, spillovers are larger in countries with similar characteristics and countries where there is less likelihood of capital controls and share similar macroeconomic and structural characteristics compared to those countries in the same region.

Third, spillovers of capital controls have become predominant in the aftermath of the GFC. Also, the inflow controls have a higher degree of cross-border effects than outflow controls.

Fourth, the role of disaggregate capital controls and the compositional effect of capital flows lead to varying degrees of capital flows deflection effect.

V. WELFARE IMPLICATIONS OF CAPITAL CONTROLS

Large capital flows pose several externalities in the domestic economy in the form of pecuniary externalities, aggregate demand externalities, and exchange rate volatility. At the policy level, it can lead to challenges in the undertaking of monetary policy autonomy. So, various policy motives point out the justification of capital controls as the second-best policy. First, the imposition of controls may be driven by the motive of reducing financial risks intermediated by large and volatile capital flows or prudential concerns. Second, to manage the aggregate demand problem that takes place in the case of capital swings and rigidity in the economy, policymakers may impose capital controls on the speculative flows. Further, they can be used to limit the appreciation of undervalued currencies for mercantilism motive. On the other hand, a large country having a substantial influence on the global capital market can change the intertemporal terms of trade or world rate of interest by imposing controls. In other words, the borrower country can lower the world rate of interest by imposing controls on inflows. On the other hand, the lender country has the incentive to increase the controls or tax rate to increase the world rate of interest. So, it can intensify the outflow restrictions. Also, political and economic factors like market imperfection justify the capital controls intervention. However, there is an existence of trade-off as various spillover effects of capital controls can take place. Intuitively, one question arises, do the spillovers of capital controls lead to Pareto-efficient allocations? [26]

Korinek (2020) suggests that it is important to identify the conditions under which the spillovers are Pareto-efficient.[27] So, greater global policy coordination or international cooperation is necessary in the case of Pareto inefficient allocations.[28] According to Korinek (2011), international cooperation is justified less if controls are employed by small countries and are competitive. In that case, even if the Nash equilibrium is associated with capital war and a fall in the world rate of interest, the outcome will be Pareto efficient. This explanation is based upon the argument of the first welfare theorem that a price mechanism or the real interest rate plays a role in mediating externalities of capital controls in a perfectly competitive framework. Coordination is justifiable when controls become monopolistic and has more costs in terms of deadweight administrative costs as a result of circumvention.

[26] The Pareto-efficient allocation refers to a situation where the domestic improvement is not possible without affecting other countries.

[27] Broadly, there are two types of spillovers; real spillovers and policy spillovers. A real spillover is a scenario where there is massive capital outflow due to an unfavorable domestic investment environment. Similarly, the policy spillovers result in diversion of capital flows through the national policies such as tax on the domestic investment.

[28] The multilateral coordination is associated with a "free lunch", where some countries can be better off without hurting others.

Costinot, *et al*. (2014) show theoretically that the Nash equilibrium becomes Pareto inefficient under the conditions of monopolistic capital controls. Eventually, there is a scenario of a 'global capital war' where welfare declines. Hence, several circumstances should be scrutinized in the context of the motivations behind inflow capital controls. Ostry *et al*. (2012) identify four possible cases for the rationality of multilateral consideration in the case of capital control measures. First, when capital controls are used to substitute for external adjustments, unwarranted external adjustments take place in other countries. Controls used for mercantilism behavior, or the purpose of undervaluation are not in the domestic interest[29] and are costly for the rest of the world. In other words, when controls are used to undervalue the domestic currency, the CA becomes surplus. This results in beggar-thy-neighbor behavior thereby can create challenges to multilateral coordination. Second, when capital controls are used as the second-best policy tool to address the learning-by-doing externality, trade[30] and currency wars can occur. This chain reaction will raise the barriers globally and lead to a sub-optimal prisoner's dilemma equilibrium (IMF, 2011b). The first best policy like production subsidy is the natural response to minimize the externalities in the traded sector and increase its welfare. Further, a production subsidy does not lead to a trade war as it has no clear effect on the trade balance. Also, it does not distort decisions regarding consumption. But, if the sector is informal and outside the periphery of the tax/subsidy net and there is an existence of budgetary constraint, capital controls become the last resort. However, controls have the potential to distort domestic consumption decisions and have a clear effect on the CA balance. Jeanne (2012) shows that the repercussions of China's capital controls are undervaluing currency, and it has contributed to lower domestic demand, global recovery, and an increase in global imbalances. So, the Nash equilibrium becomes Pareto inefficient when capital controls are imposed to undervalue the domestic currency to raise production, and employment at the cost of foreign employment (Jeanne, 2012). Third, the outcome is Pareto inefficient when capital controls are used for strategic gain or the manipulation of TOT. Fourth, when capital-receiving countries do not tend to internalize the effect of capital controls on the other countries then the overall controls become too much, and the outcome is not Pareto efficient. If they would internalize the effect of controls, then the Nash equilibrium would be efficient. So, in this context, several multilateral policy coordination is of high significance (Ostry *et al*., 2012; Eichengreen *et al*., 2013; Garcia *et al*., 2015).

This section provides several circumstances when the welfare of capital controls can reduce. First, capital controls can lead to distortions in the optimal global allocations when they are monopolistic. Other possible scenarios include when capital controls act as substituting the external adjustment, are used as the second-best policy tool to address the learning-by-doing externality, and are used to manipulate TOT. Also, capital controls welfare declines when capital-receiving countries do not internalize the effect of capital controls on other countries.

[29] Capital controls are justified in the case of domestic distortions (Ostry *et al*., 2011).

[30] As not all countries become CA surplus, countries will retaliate by imposing capital controls.

VI. THE FUTURE RESEARCH DIRECTIONS

There is a limited number of available studies that have explored the facets of the spillover effects of capital control actions. The existing studies are subject to several shortcomings. First, although, the existing studies focus on the deflection effect and policy response effect of capital control policies taking a group of countries, the studies have failed to address how quickly, or slowly financial flows deflect to the individual countries and their respective capital controls policy responses. Second, the existing literature has analyzed the deflection effect of capital controls at the country level. Limited studies have tested the deflection effect in the banking sector. Third, even if the literature has addressed the implications of capital controls on the elements of the trinity, capital market covariance, and the macro-financial implications are not analyzed properly. Fourth, COVID-19 has disrupted the trade and financial linkage around the globe. Several countries are overburdened by the massive magnitude of the debt service problem and capital flight. This has dragged attention to capital outflow controls. Thus, the implications of capital outflow controls are a matter of study. Finally, the existing theoretical literature has not connected the impact of capital inflow controls on cross-border productivity growth by discussing the direct channels. Cross-border productivity growth may also be affected by capital control policies. The deflection effect can result in periods of massive capital mobility across several countries. A set of literature is related to the productivity implications of periods of large capital inflows. The large capital inflows are associated with several indirect benefits, like better governance, financial development, institutional quality, and macroeconomic stability, thereby can lead to a higher level of productivity (Kose *et al*., 2009).[31] On the other hand, some studies focus on resource misallocation and thus, associated productivity loss resulting from large capital inflows (Fagan and Gaspar, 2006; Reis, 2013; Benigno and Fornaro, 2014).

In this context, we suggest some missing links that can give direction to the future research agenda. The first missing link is related to the proximity of deflection and policy response effects on individual countries against capital controls by the policymakers of other similar countries. Second, it would be interesting to explore the role of bank characteristics (risks, profitability) in affecting the deflection effect. The third missing link is to empirically examine the impact of capital inflow controls on cross-border financial indicators such as asset prices, housing prices, credit growth, exchange rate, and macroeconomic indicators like overheating pressure, CA problem, etc. The fourth missing link is to evaluate the impact of inflow controls on the cross-border business and financial cycles. The inflow controls are associated with the deflection effect in some countries. Hence, serious progress is required in the construction of theoretical models and transmission channels in finding the spillover implication of capital controls on the domestic business and financial cycles. The fifth missing link is to call for a separate section of studies on the spillover effect of controls on firm-level performance. Finally, it will be a daunting task for the researchers to establish a theoretical analysis to explore its cross-border productivity growth implications. Although a set of literature addresses the productivity growth effect of capital inflows, the direct link

[31] However, Tytell and Wei (2004) find modest evidence of capital flows on the macroeconomic discipline. The effect is less in the case of fiscal deficit than inflation.

between capital controls and productivity growth in a cross-border framework is absent. This opens a space for good avenues for future research. Researchers should focus on exploring the above areas.

VII. CONCLUSION AND POLICY IMPLICATIONS

In response to the dramatic fluctuations in financial flows in the aftermath of the GFC, several EMEs have employed various types of capital controls for macroeconomic management, prudential management, domestic monetary autonomy, and minimization of exchange rate volatility in the circumstances of lack of space in macroeconomic stabilization policy tools. But the unilateral capital controls in an uncoordinated manner are associated with various forms of externalities which may be Pareto inefficient or globally sub-optimal under several conditions.

There is a fast-growing literature on the spillover effects of capital controls. Past studies have not covered well-organized and summarized literature on the spillovers of capital controls. Hence, in this context, this study provides a comprehensive overview of the cross-border effects of capital controls. The study concludes that the capital depression effect, the abundance of global liquidity, the deflection effect, the amplification of cross-border business cycles, cross-border macro-financial fragilities, and cross-country trilemma problems are the spillover effects of capital inflow controls. Also, the local capital markets of EMEs have become highly sensitive to risk contagion from global financial shocks due to controls on inflows. On the other hand, the cross-border consequences of capital outflow controls include adverse effects on firm-level activities, sub-optimal global output, and similar policy response effects. However, empirical evidence has recognized that spillovers are of varying degrees concerning the direction of controls by policymakers. When the policy makers impose inflow controls then the deflection effect becomes massive. On the other hand, the outflow controls have insignificant spillovers. Also, the geographical region and similar economic characteristics matter for the extent of spillovers. The spillovers tend to take place in countries that either belong to the same geographical region or have similar characteristics like a similar level of risk, return, trade openness, etc. Furthermore, the applied literature has found higher spillovers in the aftermath of GFC. This confirms the fact that countries are more vocal about IMF's institutional view. Finally, the deflection effect of capital controls is more in the case of short-term capital flows and disaggregate capital controls.

However, the spillovers of capital controls are always not Pareto efficient. When the controls are used for prudential reasons thereby competitive in nature, the outcome is not necessarily Pareto inefficient. However, inefficiency arises when controls are imposed for mercantilism purposes to improve domestic production, and employment as it adversely affects the warranted external adjustment. Similarly, the imposition of controls for strategic gain by large borrower and debtor countries can lead to sub-optimal resource allocation. Further, when the effects of capital controls are not internalized by the capital-receiving countries the outcome is associated with capital controls war and thereby, Pareto inefficient equilibrium.

These findings have several policy implications. First, the use of capital controls should be based on country-specific factors like domestic conditions (financial development, institutional quality, policy soundness, and trade openness). Also, capital controls may respond to several circumstances (overvaluation of domestic currency, reserve adequacy above precautionary level, overheating problems, and zero macroeconomic policy space) and objectives (prudential management). Second, there should be flexibility in the imposition of capital controls. In other words, it should be changed depending on the sentiment of investors (Massa, 2011). Third, several circumstances should be scrutinized in the context of the motivations behind inflow capital controls. Capital controls should not substitute for an external warranted adjustment. In other words, capital controls should be used to minimize domestic distortions and should not act as a beggar-thy-neighbor policy. Jeanne *et al*. (2012) suggest that 15 percent price-based capital controls should be there to achieve transparency and multilateral coordination. Fourth, the bar should be high for capital controls when the usage of controls tries to address the learning-by-doing externality. Fifth, multilateral controls should not be monopolistic. In other words, it should not be used to achieve strategic gain. Sixth, coordination among capital-receiving countries and between the source and receiving countries is necessary to increase global welfare. The notion of coordination between source and receiving countries dates back to the Keynes-White view of the operation "at both ends of the transaction". There is a need for policy coordination between source and receiving countries. The capital-source countries need to limit their spillovers from macro-financial policies, monetary policies, and prudential regulation to enhance the potential benefits of global coordination (Jeanne *et al*., 2012).[32] The source countries should keep an eye on the redistributive dimension of spillovers because the inflow controls in capital-receiving countries can affect the investment opportunities of source countries negatively. So, the source countries should restrict the international spillovers of easy monetary policy. On the other hand, the capital-receiving countries are required to lower more intense prudential regulations including capital controls as a whole. They are required to undertake anchored inflation expectations and flexible exchange rate policies. Finally, the policymakers can follow the recommendations by Jeanne *et al*. (2012) in the undertaking of controls: (1) Countercyclical restrictions, (2) development of a code of good conduct on non-distortive capital control measures, and (3) International supervision of capital controls.

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[32] But, the coordination between source and recipient countries involves a greater magnitude of complexity. However, Ostry *et al*. (2012b) are optimistic about the coordination because of three reasons; a higher level of welfare is associated with the coordination among source and recipient countries than that of recipient countries. Second, even if source countries sacrifice the profits with the less outflows, the risks of losses associated with the foreign lending at the time of crises can be reduced. Third, as international creditors, they may enjoy a terms of trade gain that may offset the loss.

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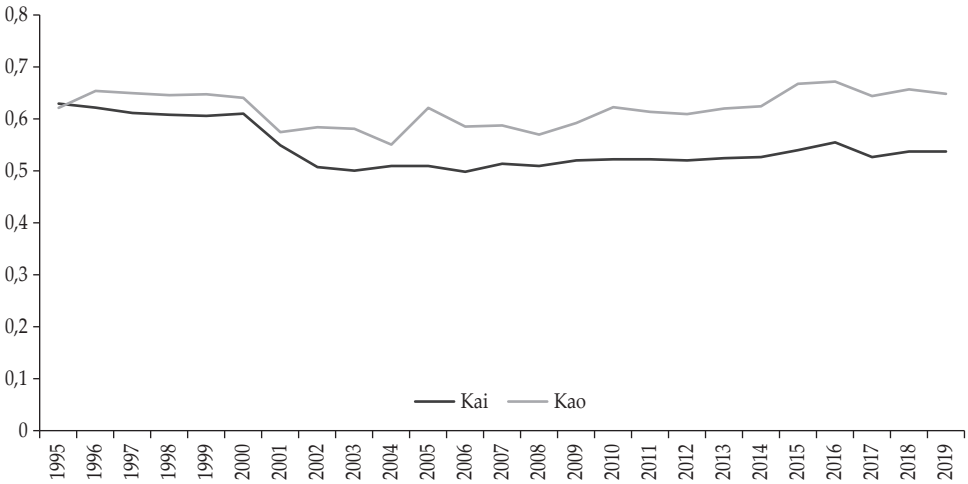
APPENDIX

Figure A.I
Capital Inflow and Outflow Controls of 25 EMEs from 1995 to 2019

Figure A.I provides the trend of the level of capital inflow and outflow Controls of 25 EMEs from 1995 to 2019. It clearly shows that the level of capital controls has increased in the aftermath of the 2008 GFC.

Note: The terms Kai and Kao refer to capital inflow controls and capital outflow controls respectively. List of EMEs included in this study: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Iran, Korea, Kuwait, Malaysia, Mexico, Philippines, Poland, Qatar, Russia, Saudi Arabia, South Africa, Thailand, Turkey, and the United Arab Emirates. Our selection of the list of EMEs is based on The IMF World Economic Outlook and Morgan Stanley Capital International index (MSCI). However, the information on capital controls in the context of Taiwan is not available in this indicator.



Source: Fernández *et al*. (2016)

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