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The impact of sudden stops in capital flows on output and investment: Selected emerging markets

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Abstract. We evaluate how vulnerable the emerging markets are to sudden stops, that is, capital inflow reversals, using panel data for 12 emerging economies for the period 1976-2002 that experienced such reversals. We investigate the impact of sudden stops on the macroeconomic indicators of economic growth and investment by employing the Generalized Method of Moments (GMM) estimation methodology. A robustness check is performed using regional groups and introducing additional control variables. We find that sudden stops have lagging, negative, and robust effect on output and investment, while the effect on investment is not always robusth.
Keywords. Sudden stops, Economic growth, Capital flows, Emerging markets, GMM.
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1. Introduction

The first major wave of financial globalization occurred in 1860–1914; Obstfeld & Taylor (2001) identify the second in the last three to four decades of the twentieth century, which peaked in the 1990s. Financial globalization makes sudden stops, Calvo's (1998) term for capital inflow reversals, a key feature of the world economy during the 1990s, when many emerging countries experienced the phenomenon. When countries have high capital mobility, sudden stops of capital inflows occur frequently and can be highly disruptive.

As Calvo (1998) and later Calvo, Izquierdo, & Talvi (2006) explain, a country experiences a sudden stop when the annual flow of international capital reduces by more than two standard deviations from the mean flow, while the spike in the aggregate Emerging Market Bond Index spread exceeds two standard deviations from its mean over the year. When accompanying substantial collapses in bank credit and the current account deficit, sudden stops tend to result in macroeconomic crises such as output collapse, banking crisis, and widespread corporate and household bankruptcies. Sudden stops may severely affect investment, one of the immediate indicators associated with the capital market, because an interaction between systemic capital market forces and domestic financial vulnerabilities typically trigger them (Calvo *et al.* 2004; Calvo & Talvi, 2005).

Severe incidents of sudden stops began to affect emerging market economies in the 1980s. They have become larger over time, and, as that would suggest, have a larger impact on the economy as a whole. As Calvo, Izquierdo, & Talvi (2006) indicate, certain country-specific vulnerabilities determine the impact, such as the extent to which a particular country's currency is linked to the dollar. Sula's (2010)

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empirical investigation of 38 emerging market economies between 1990 and 2003 shows that the probability of a sudden stop increased between these dates because of the surge in capital inflows. Further, economies with a high current account deficit or an appreciated real exchange rate experience particular vulnerability because the capital inflow consists of private loans and portfolio flows rather than direct investment. Those factors are quite prevalent in emerging market economies. Mishiki (1999) argues that institutional features of debt market primarily drive the greater severity of financial crises in emerging market economies compared with industrialized countries, while the pegged exchange-rate regimes, weak prudential supervision of the banking system, and impetuous financial liberalization are secondary causes.

As Calvo (1998) indicates, economic collapse in emerging markets leads to sharp recession, high unemployment, and soaring rates of poverty. Mexico's Tequila Crisis (1994), the Asian crisis (1997) and the Russian crisis (1998) were all triggered by sudden stops, which hurt economic growth in the affected economies deeply.

The sudden stop that precipitated the Tequila Crisis largely occurred because of tightening monetary policy in the United States and political instability in Mexico. The Mexican government devalued its currency by approximately 50 percent in December 1994, causing a fear of government default by foreign investors, which led them to cease investing in the country, creating a capital inflow reversal. The financial crisis spread to the Southern Cone and other developing countries. Investors placed a higher risk premium on Mexican assets, which made interest rates in Mexico increase rapidly. As the costs of borrowing became higher, many borrowers who had loans from commercial banks or foreigners defaulted on their debt, hurting the banking system and economic growth. Mexico experienced its largest one-year output decline in 1995,a decline of more than six percent. In addition, hyperinflation made real wages shrink by 25-35 percent. Unemployment rate almost doubled from 3.9 percent to 7.4 percent, and more than one million people lost their jobs. Extreme poverty grew to 37 percent in 1996 from 21 percent in 1994, reversing impressive gains in poverty reduction in the previous ten years, and the poverty levels did not return to their pre-recession level until 2001.[1]

Sudden stops always lead to output collapse. Mendoza (2010) shows that sudden stops are also associated with plummeting GDP growth, consumption, and investment and that those indicators recover slowly over the course of years. By contrast, Calvo, Izquierdo, & Talvi (2006) argue that emerging markets can rise quickly from their own ashes after sudden stops, despite large output collapse, even when credit and capital inflows do not cover and investment recovery remains weak. They argue that the economic activity in countries affected by sudden stops reaches pre-crisis levels in less than three years on average, based on total factor productivity.

Joyce (2009) argues that collapse in investment associated with sudden stops has negative impact on economic growth in emerging market countries in the long run; he argues the phoenix-like recovery of output growth in these countries masks the consequence of persistently low even output. Specifically, he indicates that output recovery without investment can compromise the robustness of the recovery. Data from the World Bank's World Development Indicator support Joyce's (2009) results. In East Asia following the Asian Crisis that began in 1997, output recovered quickly but the investment to GDP ratio took much longer. In Indonesia, GDP growth plummeted sharply from 7.82 percent in 1996 to -13.13 percent in 1998, and was still at 4.92 percent in 2000. The drop in the investment to GDP ratio, from more than 30 percent before the crisis to 16.8 percent in 1998 and 11.4 percent in 1999, did not recover until 2009. GDP growth fell from 5.90

[1] Pereznieto, Paola (2010), The Case of Mexico's 1995 Peso Crisis and Argentina's 2002 Convertibility Crisis: Including Children in Policy Responses to Previous Economic Crises, UNICEF Working Paper

percent in 1996 in Thailand to -10.51 percent in 1998, and recovered to 4.45 in 1999. However, the investment to GDP ratio declined by almost half in the crisis and had not returned to the pre-crisis level in 2016, the latest available data.[2]

In this paper, we examine the impact of sudden stops on both the GDP growth and investment of 12 emerging economies between 1976 and 2002. We account for the possibility that sudden stops have lagging effect on output and investment and we apply Arellano & Bond's (1991) dynamic panel GMM estimation procedure to address the concern that sudden stops and shrinkage of GDP growth are likely to have a simultaneous causality issue and accordingly the estimation of this dynamic panel has a bias.

Multiple control variables are applied to help explain the converging or distracted impacts on the dependent variables. We use government consumption and human capital, and other necessary determinants of economic growth, as control variables in the regression for GDP growth. Lagged GDP growth, Foreign Direct Investment (FDI) to GDP ratio, debt service (measured by debt service to GDP ratio) and real interest rate, are also employed as control variables. Because the performance of output is usually associated with investment in emerging markets, and output growth in the previous year also lays a foundation for future investment, we apply the two variables as control variables to each other in the regressions. We check the robustness by setting up regional groups and adding variables.

The results in this paper support an understanding that sudden stops in emerging market economies have a negative impact on both output and investment. They also show that these effects lag. Previous theoretical and empirical studies tend to focus on the impact of sudden stops on output. Our study confirms previous research work in this area that investment should not be ignored. However, the impact of investment is not always robust and also sometimes varies across the region.

The paper proceeds as follows: Section II depicts the data used in this paper. Section III explains the methodology applied in the context. Section IV presents the impact of sudden stops on GDP growth and investment, employing dynamic panel GMM methodology. Section V divides the countries into regional groups and introduces new control variables, then describes the results of robustness tests. Section VI concludes the paper.

2. Data

The paper uses panel data for sudden stops identified in Calvo (2003) between 1976 and 2002 identified among 12 emerging economies: Argentina, Chile, Ecuador, Hungary, Indonesia, Malaysia, Mexico, Philippines, Venezuela, South Korea, Thailand and Turkey. We focus on economic growth and investment. Defining sudden stops as a dummy variable, valued at one if in a given year the country suffered from sudden stops and zero otherwise, we will run a set of regressions to analyze the impact on the dependent variables.

[2] Source: World Development Indicator by World Bank

Table 1. *Sudden Stops distribution*

Country	Episode	SS (percentage of GDP)
Argentina	1982-83	20
Argentina	1994-95	4
Chile	1981-83	7
Chile	1990-91	8
Ecuador	1995-96	19
Hungary	1995-96	7
Indonesia	1996-97	5
Malaysia	1993-94	15
Mexico	1981-83	12
Mexico	1993-95	6
Philippines	1996-97	7
Venezuala	1992-94	9
Korea	1996-97	11
Thailand	1996-97	26
Thailand	1993-94	10

Source: Calvo & Reinhart (2000) from World Bank, *World Debt Tables*, various issues; and Institute for International Economics, *Comparative Statistics for Emerging Market Economies*, 1998.

Table 2. *Data Definitions and Sources*

Name	Definition	Source
SS	dummy variable takes 1 if there is a sudden stop in country *i* at the time *t*, 0 otherwise	Calvo (1998)
GDPgrowth	gross domestic product, real, percent	IMFIFS
investmentGDP	gross capital formation (% of GDP) growth	WDI
inflation	inflation, change of consumer prices (annual %)	WDI
TradeGDP	trade (% of GDP)	WDI
FDIGDP	foreign direct investment (% of GDP)	WDI
debtserviceGDP	total debt service (% of exports of goods, services and primary income)	WDI
STdebtratio	short-term debt (% of total external debt)	WDI
InterestRate	real interest rate (%)	WDI
GOVConGDP	general government final consumption expenditure (% of GDP)	WDI
HumanCapital	gross enrolment raio, secondary, both sexes (%)	WDI

To control the effects of omitted variables, we tend to include other determinants of each dependent variable by consulting empirical literatures. For economic growth, the main control variables are government purchase, investment, and human capital. All of these variables are directly associated with output growth. For investment, the main control variables are lagged GDP growth, interest rate, FDI, and debt service, in which the lagged GDP growth and FDI affect investment positively, while interest rate and debt service function negatively. The macroeconomic data were obtained from the World Bank's World Development Indicators, supplemented by the IMF's International Financial Statistics and from other empirical literatures.

3. Estimation methodology

In our basic model, the dependent variables are determined by:

$$y_{it} = \sum_{j=1}^{n} \beta X_{ijt} + \gamma SS_{it} + \alpha_i + \delta_t + \varepsilon_{it} \quad (1)$$

where X is the matrix of control variables for each dependent variable, SS is a dummy variable that takes a value of 1 if there is a sudden stop in country i at the time t, α_i is country fixed effect, δ_t is a vector of year dummies, and ε_{it} is the error term.

The existing empirical literature suggests that both economic growth and investment display persistence which calls for the lagged dependent variable on the right-hand side through a partial adjustment mechanism. To address this concern, we employ the GMM methodology, including both the difference GMM and system GMM. The sign, magnitude, and statistical significance of the dummy variable will be used and compared to explain the impact of sudden stops in each estimation. Results of a Sargan test and an AB test will show if the model is

correctly specified and there is no serial correlation in the error term of higher-order.

Finally, we will test for the robustness of the results by dividing the data into sub-samples across regions and introduce additional control variables to rule out the possibility that the dummy is acting as a proxy for the influence of other incentives to economic growth and investment.

4. Estimation results

The existing empirical literature suggests that both economic growth and investment display persistence, which is evident through the lagged dependent variable on the right-hand side through a partial adjustment mechanism. Especially for times-series dominant data, the value of an outcome variable from the previous period has a big influence on the dependent variable over the value of the outcome variable in the current period. However, by introducing a lagged dependent variable, we enable a demeaning process that creates a correlation problem between regressors and the error term. To solve this issue, we use further lags of the dependent variable as instrument variables as proxies of lag dependent variables by implementing Arellano Bond "Difference GMM" and Arellano Bond/Blundell-Bond "System GMM" techniques.

We firstly assume that all regressors are strictly exogenous and run the difference GMM. Therefore the only variable that appears in the GMM instrument set is the lag of the dependent variable. However, since these independent variables are very likely to suffer from an endogeneity problem, we re-estimate the model by including all the regressors in the GMM instrument set for last two regressions. Regression (4) takes the heteroskedasticity assumption into consideration.

Table 3. *The Lagged Impact of the Sudden Stop on Output Growth, Difference GMM*

	(1)	(2)	(3)	(4)
Lagged SS	-1.744**	-1.602**	-1.946***	-1.946**
	(0.721)	(0.726)	(0.713)	(0. 560)
Lagged GDPgrowth	0.089*	0.090*	0.105**	0.105***
	(0.050)	(0.050)	(0.050)	(0.045)
DGOVConGDP	-0.207	-0.198	-0.264	-0.264
	(0.227)	(0.226)	(0.224)	(0.220)
DHumanCapital	0.035	0.030	0.038	0.712
	(0.076)	(0.076)	(0.076)	(0.082)
DinvestmentGDP	0.730***	0.731***	0.712***	0.712***
	(0.056)	(0.056)	(0.055)	(0.082)
Observations	212	212	212	212
Sargan test (p-value)	0.041	0.058	0.085	0.085
1st order serial correlation(p-value)	0.000	0.000	0.000	0.002
2nd order serial correlation(p-value)	0.209	0.199	0.242	0.151

Note: Dependent variable is the GDP. Equation 1 is estimated with difference GMM with only lagged GDP growth as a GMM estimator. Equation 2 is estimated with difference GMM with lagged sudden stops and lagged GDP growth as GMM estimators. Equation 3 estimated with difference GMM with all variables as GMM estimators. Column 4: Robust Standard Errors with all as GMM estimators. Standard errors are in parentheses. * Significant at 10%, ** significant at 5%, ***significant at 1%.

As the results of Table 3 suggest, the impact of sudden stops in the result is statistically significant with the negative sign as expected, and the variation of coefficients is small. The lagged dependent variable is positively correlated with current value and it is statistically significant. Investment is significant and has positive effect on GDP growth. The Arrelano-Bond test does not support a rejection of the serial correlation of order 1 but does support a rejection of serial correlation of orders 2 in all cases. However the Sargan test indicates that the instruments variables are not passable in the first equation and are barely passable in the latter three cases.

Another way of implementing GMM to dynamic panel data models is to include not only the lags of differences, but also the levels of dependent variable as

instruments. Same as difference GMM, we here assume that serial correlation of differenced error is limited to one lag.

Table 4. *The Lagged Impact of the Sudden Stop on Output Growth, System GMM*

	(1)	(2)	(3)	(4)
Lagged SS	-1.453**	-1.434**	-1.434*	-1.434**
	(0. 737)	(0. 555)	(0. 737)	(0. 555)
Lagged GDPgrowth	0. 288***	0. 288***	0. 288***	0. 288***
	(0.046)	(0.046)	(0.054)	(0.054)
DGOVConGDP	-0.219	-0.204	-0.204	-0.204
	(0.244)	(0.214)	(0.214)	(0.214)
DHumanCapital	-0.002	-0.011	-0.011	-0.011
	(0.080)	(0.079)	(0.106)	(0.106)
DinvestmentGDP	0.729***	0.727***	0.727***	0.727***
	(0.061)	(0.060)	(0.085)	(0.085)
Observations	240	240	240	240
Sargan test (p-value)	0.061	0.058	0.144	0.144
1st order serial correlation(p-value)	.	0.000	0.000	0.002
2nd order serial correlation(p-value)	0.216	0.199	0.203	0.146

Note: Dependent variable is the GDP. Equation 1 estimated with system GMM with only lagged GDPgrowth as the GMM estimator. Equation 2 estimated with system GMM with lagged sudden stops and lagged GDPgrowth as GMM estimators. Equation 3 estimated with system GMM with all variables as GMM estimators. Column 4: Robust Standard Errors with all as GMM estimators. Standard errors are in parentheses. * Significant at 10%, ** significant at 5%, *** significant at 1%.

With system GMM, the lagged sudden stops negatively affects output. Table 4 shows thatin the year following a sudden stops, output growth decreases by around 1.4%, ceteris paribus. In the last two equations, Sargan test results show that the instruments are acceptable at all conventional levels. Therefore, the model and over-identifying conditions are correctly specified. Again, the Arrelano Bond test confirms a serial correlation of order 1, but no serial correlation of order 2 or beyond. Lagged GDP growth is statistically significant across the equations and so is the investment ratio. However, government expenditure and human capital are not statistically significant.

Next, we employ the same approach we used above to test the impact on investment. Table 5 presents the results. The set of control variables to be chosen here are lagged GDP growth, interest rate, foreign direct investment, and debt service to GDP ratio.

Table 5. *The Lagged Impact of the Sudden Stop on Investment, Difference, and System GMM*

	(1)	(2)	(3)	(4)
Lagged SS	-1.984	-2.372***	-2.372*	-2.372*
	(1.348)	(0.857)	(1.246)	(1.246)
Lagged investment	0.592***	0.667***	0.667***	0.667***
	(0.072)	(0.048)	(0.047)	(0.047)
Lagged GDPgrowth	0.396***	0.385***	0.385***	0.385***
	(0.071)	(0.072)	(0.069)	(0.069)
InterestRate	0.047	0.031	0.031	0.031
	(0.042)	(0.020)	(0.028)	(0.028)
FDIGDP	0.398	0.268*	0.268	0.268
	(0.303)	(0.153)	(0.221)	(0.221)
debtserviceGDP	-0.008	-0.047*	-0.047**	-0.047**
	(0.031)	(0.025)	(0.021)	(0.021)
Observations	138	146	146	146
Sargan test (p-value)	0.196	0.403	0.403	0.403
1st order serial correlation(p-value)	0.015	.	0.017	0.017
2nd order serial correlation(p-value)	0.272	0.000	0.241	0.241

Note: Dependent variable is investment to GDP ratio. Equation 1 is estimated with difference GMM while treating all variables as endogenous. Equation 2 and 3 used system GMM with normal and robust standard error and all variables are treated as strictly exogenous. Last estimation used same methodology with heteroscedasticity-robust standard error and all regressors are in GMM instrument set. Standard errors are in parentheses. * Significant at 10%, ** significant at 5%, *** significant at 1%.

The logic behind this is as follows: lagged output growth usually has a positive correlation with future investment. But investment is negatively correlated with interest rate and debt service in a certain country, as these will impose additional costs on enterprises' investment. FDI, on the other hand, tends to incentivize domestic investment, especially along the value chain. With these theories and empirical evidence in mind, we begin our analysis of impact on investment with running GMM technique by using lagged investment as one of the model's regressors.

The results of Table 5 show that the sudden stops have a lagging effect on investment. The year after a country suffers from a sudden stop, the investment to GDP ratio will fall by 2.372 percentage points, holding everything else constant. Lagged investment and lagged GDP growth both have a positive impact on investment in the current period at 1% statistical significance. Holding others constant, one percentage increase in the prior year's investment tends to increase investment to GDP ratio by 0.667 percent. And one percentage increase in the prior year GDP will increase the investment to GDP ratio by 0.385 percent. Sargan tests all show that models and over-identifying conditions are correctly specified. Arrelano-Bond tests all state that first order but not second order serial correlation exists, except for the second equation. The outcome in system GMM is consistent with the literature and shows sudden stops tend to have an adverse effect on domestic investment.

5. Robustness check

Asian economies have structural difference compared to countries in Latin America, including higher savings rate, better current account balance, etc. (Calvo, Izquierdo, & Meijia, 2004), and sudden stops may have various effect on the two regions. Therefore, we set up the Asian Group including Indonesia, Malaysia, Philippines, South Korea and Thailand; and Latin American Group including Argentina, Chile, Ecuador, Mexico, Venezuela.

The results of Table 6 shows that the impact of lagged sudden stops is statistically significant in most cases and is negative, as concluded above. It also shows that sudden stops affect Asian countries more severely than Latin American countries. As Calvo, Izquierdo, & Meijia (2004) explain, the higher saving rates, better current account balances, and stronger macroeconomic fundamentals in Latin America produce this effect.

Table 6. *Robustness Check for Impact on Output Across Regions*

	(1)	(2)	(3)	(4)
	Asian Countries	Latin American Countries		
	Fixed effects	System GMM	Fixed effects	System GMM
Lagged SS	-1.812	-2.638*	-1.771**	-0.388*
	(1.577)	(1.463)	(0.449)	(0. 701)
Lagged GDPgrowth		0.375***		0. 155**
	.	(0.108)	.	(0.080)
DGOVConGDP	-0.818	-0.576	0.173	0.055
	(0.399)	(0.372)	(0.190)	(0.254)
DHumanCapital	-0.301**	-0.236***	0.041	0.024
	(0.083)	(0.065)	(0.111)	(0.116)
DinvestmentGDP	0.705***	0.621***	0.716**	0.739***
	(0.092)	(0.060)	(0.188)	(0.174)
Observations	112	112	93	93
Sargan test (p-value)	.	0.262	.	0.117
1st order serial correlation(p-value)	.	0.046	.	0.029
2nd order serial correlation(p-value)	.	0.671	.	0.087
R^2 (overall)	0.486	.	0.366	.

Note: All have robust standard error. Asian countries: Indonesia, Malaysia, Philippines, South Korea, Thailand. Latin American countries: Argentina, Chile, Ecuador, Mexico, Venezuela. Standard errors in parentheses. * Significant at 10%, ** significant at 5%, *** significant at 1%.

The occurrence of sudden stops affect Asian countries by a decrease of 2.638 percent in output, while they affect Latin American countries by a decrease of 0.388 percent, holding everything else constant. The investment to GDP ratio is very robust and the magnitude is quite similar between the two regions. Both Sargan tests in system GMM indicate that the model is correctly specified. Results of the serial correlation are as expected in the model for Asian countries.

We then checked the robustness of result on investment across regions. As the results of Table 7 shows, the impact of sudden stops in lagged term has no statistically significant impact on Asian countries' investments in either the fixed effects or the system GMM models. For Latin American countries, the impact is negative and is statistically significant at a 5% level. However, a postestimation test shows that the instruments used in a system GMM are not exogenous.

Table 7. *Robustness Check for Impact on Investment Across Regions*

	(1)	(2)	(3)	(4)
	Asian Countries	Latin American Countries		
	Fixed effects	System GMM	Fixed effects	System GMM
Lagged SS	0.203	-1.981	-2.083	-1.916**
	(2.120)	(2.221)	(1.211)	(0.827)
Lagged investment		0.610***		0. 486***
	.	(0.079)	.	(0.134)
Lagged GDPgrowth	1.024***	0.589***	0.254**	0.152***
	(0.048)	(0.046)	(0.077)	(0.043)
InterestRate	0.245	0.222***	0.016	0.018
	(0.133)	(0.031)	(0.055)	(0.018)
FDIGDP	0.585	0.198	0.570	0.316
	(0.467)	(0.274)	(0.437)	(0.345)
debtserviceGDP	-0.080	-0.035	0.043	-0.021
	(0.187)	(0.052)	(0.153)	(0.030)
Observations	85	85	61	61
Sargan test (p-value)	.	0.406	.	0.075
1st order serial correlation(p-value)	.	0.094	.	0.106
2nd order serial correlation(p-value)	.	0.119	.	0.369
R^2 (overall)	0.624	.	0.154	.

Table 8. *Robustness Check for Impact on Output Incorporating New Control Variables*

	(1)	(2)	(3)	(4)
Lagged SS	-1.434**	-1.349***	-1.589***	-1.019*
	(0. 555)	(0. 476)	(0.529)	(0.610)
Lagged GDPgrowth	0. 288***	0. 263***	0. 266***	0. 215***
	(0.054)	(0.056)	(0.615)	(0.071)
DGOVConGDP	-0.204	-0.236	-0.188	-0.318
	(0.214)	(0.205)	(0.208)	(0.216)
DHumanCapital	-0.011	-0.033	-0.000	-0.214***
	(0.106)	(0.112)	(0.097)	(0.075)
DinvestmentGDP	0.727***	0.718***	0.729***	0.640***
	(0.085)	(0.086)	(0.085)	(0.068)
Inflation		-0.014		
		(0.010)		
TradeGDP			0.014***	
			(0.003)	
STdebtratio				0.167***
				(0.033)
Observations	240	240	240	193
Sargan test (p-value)	0.144	0.093	0.177	0.062
1st order serial correlation(p-value)	0.002	0.002	0.002	0.005
2nd order serial correlation(p-value)	0.146	0.139	0.163	0.086
	(1)	(2)	(3)	(4)

Note: Dependent variable is the GDP. All estimations are made by system GMM with heteroscedasticity-robust standard error. Standard errors in parentheses. * Significant at 10%, ** significant at 5%, *** significant at 1%.

Lastly, in Table 8 we run another set of robustness check by adding new control variables and find out how sensitive the variable of lagged sudden stops is to these changes. Since no obvious and robust results support our hypothesis that lagged sudden stops have a strong negative impact on current investment, we will focus on the robustness of impact on output.

As the results of Table 8 shows, the impact remains negative and statistically significant. Adding new variables did not alter the magnitude dramatically from the baselines, as shown in model 1 in the first column. Post-estimation tests all have the expected results. All new control variables are statistically significant except for the inflation variable, which suggest that its variability over the period of our study does not have a major impact on output.

5. Conclusion

Using the Generalized Method of Moments (GMM) estimation methodology we analyze the impact of sudden stops on macroeconomic indicators of economic growth and investment. The results suggest that sudden stops have negative impact on both output growth and investment. In the regressions for output, when current sudden stops variable is added to the regression, the R-square is too small or the coefficient of sudden stops is statistically insignificant, due to different control variables. This implies that sudden stops may have lagging effect. By using lagged sudden stops instead of current sudden stops, we show that the lagged sudden stops have a negative coefficient which is statistically significant, no matter how the control variables change. Employing difference and system GMM estimations shows that the lagged sudden stops is also statistically significant and has a negative coefficient. These results support our hypothesis that sudden stops have negative and lagging effect on output.

The variable growth of investment to GDP ratio has an important role in explaining the model, and is statistically significant in all the regressions while other control variables are statistically insignificant. When the growth of investment to GDP ratio is added to the regression, R-square improves significantly. This indicates that investment plays a role in the impact of sudden stops on economic activities, which supplies a reason the current study is meaningful.

We perform robustness checks in two ways. Since Asian and Latin American economies differ structurally in terms of savings rate, fiscal balance, etc. (Calvo, Izquierdo, & Meijia 2004), sudden stops may have differing effects in the two regions. Therefore, we distinguish the Asian Group, Indonesia, Malaysia, Philippines, South Korea, and Thailand from the Latin American Group, Argentina, Chile, Ecuador, Mexico, and Venezuela by adding a regional dummy variable to the regression. This test excludes Hungary and Turkey. The other robustness check consists of adding additional control variables into the regression. The results show that sudden stops affect the output of Asian countries more severely than the output of Latin American countries. Adding other control variables such as inflation, trade (% of GDP), and short-term debt (% of total external debt) shows that the impact of sudden stops on output is robust. By contrast, the impact of sudden stops on investment is not statistically significant in Asian countries and is only statistically significant in GMM estimation in Latin American countries.

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