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Latin American Export Structure and the US Growth Spillover Effect in the Great Recession

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Abstract

Using panel data analysis, and focusing on export-structure related aspects of the Latin American economies, this paper finds that output fluctuations in Latin America are synchronized with the United States' business cycle in the period 1961-2012. Moreover, non-primary commodity exporters and Latin American countries whose exports have mainly been destined for the US market display an intensified output fluctuation co-movement with the US. These findings have crucial implications to address the uneven performance of Latin American economies in the Great Recession as a consequence of the real GDP contraction in the United States in 2009.

JEL classification: F44, O54

Key words: export-structure, business cycles, Great Recession, Latin America

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1. Motivation and Background

The most recent recession in the United States following the financial crisis was expected to have an immediate spillover effect on Latin American economies given the importance of the US market for Latin America's output. In fact, the downturn[1] was rapidly reflected in the region's average annual real GDP growth rate in 2009 (-1.8 percent). [2] In comparison to other regional groups of developing countries, selected using the World Development Indicators (WDI), only developing economies in Europe and Central Asia witnessed a more severe GDP contraction in the same year (-4.8 percent).[3] However, the distribution of annual growth rates in Latin America in 2009 was not uniform. While Mexico witnessed a severe GDP decline (-6 percent), Colombia, Uruguay, Dominican Republic, and Panama, for example, displayed positive annual growth rates ranging from 1.7 percent (Colombia) to 3.9 percent (Panama). Given (i) the trade collapse in the last recession, (ii) the potential growth spillover effect of the United States on the region, and (iii) the pervasive role of external factors in the Latin American business cycles, this paper empirically investigates whether export-structure related factors that may historically explain the co-movement in output between Latin America and the United States may also provide some preliminary insights on the uneven short-run performance of Latin American countries during the Great Recession.

The trade collapse and the vulnerability of the trade linkage between the US and the Latin American economies were the main reason for the fears of a negative performance in the region. Merchandise exports to the US in 2006, for example, accounted for 38 percent of total Latin American exports.[4] In terms of GDP, the importance of the US market is also noticeable. The average ratio of US-bound exports to GDP for the region was 11 percent in 2006. Other potential threats, such as capital outflows, which were propagation channels in past critical moments for the region, were downgraded given the specific nature of this crisis, which originated this time in the advanced economies, not in the developing world. This set the Great Recession apart from the Asian Crisis or even during the Latin American debt crisis in the eighties. Furthermore, global imbalances favored the financial security of the developing world for several years preceding the crisis. In particular, Latin America had been

[1] The US annual real GDP growth rate was -3.2 percent in 2009 (the deepest contraction since the Great Depression). Data from the World Development Indicators (WDI)
[2] Data from the World Development Indicators (WDI)
[3] In fact, the annual growth rates for developing economies in other regions were positive: East Asia and Pacific (7.5 percent), Middle East and North Africa (3.4 percent), Sub-Saharan Africa (2.1 percent).
[4] Calculations were based on United Nations- COMTRADE data for the 15 largest Latin American economies.

running current account surpluses before the crisis, and had favorable terms of trade since 2003, along with an outstanding accumulation of foreign assets, and fiscal and monetary discipline. These were key elements supporting the financial stability in the region. Economists have addressed the role of these aspects in cushioning the region from a more severe financial shock despite the deterioration of the world economy financial conditions.[5] However, for Ocampo (2009), who also acknowledges the positive external balance sheets in Latin America, it is the trade channel, not the financial one, which seems to be the main mechanism transmitting the income shocks in the North toward the South during the Great Recession. A comparison of the world trade volumes in 2010 with those in the period 1986-2008 leads Ocampo (2011) to suggest that the trade shock is a more important channel than either remittances or the financial channel by which the developing world was affected.[6]

Regarding the examination of a potential growth spillover effect from the US on Latin America, this paper is motivated by the literature on business cycles co-movement between countries. In general, empirical contributions on business cycles co-movements have paid more attention to large samples of countries than to particular regional analyses.[7] However, an increasing number of studies explore the business cycles co-movements between the developing and the developed world. These studies are usually framed in the context of the North-South coupling or decoupling (Akin and Kose, 2008; Walti, 2011; Kose, Otrok, and Prasad, 2012). For example, Akin and Kose (2008), who include Latin America in their sample of Southern countries, find evidence suggesting that a medium-run growth spillover effect of the Northern economic activity on the Emerging South has declined during a period identified (by the authors) as the globalization period (1986-2005). Nevertheless, countries in Asia and the Pacific seem to drive the general results. For their sample of Latin American economies, while the effect from the North on aggregate Latin American growth is positive and significant during the globalization period, and it is negative and significant for the pre-globalization period, the effects from the Emerging South are not statistically significant in any of the temporal subsamples. For a different group of developing economies, Kim, Lee and Park (2011) suggest, however, that the nature of the co-movement North-South is more

[5] For example, Corbo and Schmidt-Hebbel (2011) describe that during the 1990s and the 2000s, Latin America adopted a set of macroeconomic policies (exchange-rate floats and larger international reserves, among others) which reduced the vulnerability of the region, in comparison to previous financial shocks.

[6] Levchenko, Lewis, and Tesar (2010) also observe that the collapse of the international trade is a key aspect of the recent recession, and show that this collapse is more serious than in previous US downturns.

[7] Kose, Otrok, and Whiteman (2003) argue that this fact is explained by the convenience of having larger samples to obtain robust estimates in the econometric analysis.

complex. The authors find, for example, that China and emerging East Asian countries are increasingly more responsive to G7 shocks while G7 countries are more responsive to shocks originated in China and East Asia as well. It is worth noting that contrary to this case, the reverse causality is hardly an issue in the potential output fluctuations co-movement between Latin America and the US since Latin American economies resemble the assumptions of small economies in comparison to the US.

The focus of this paper on the United States, as an external-related source of the Latin American output fluctuations, is also motivated by the literature that highlights the role of external determinants of the Latin American business cycles (Izquierdo, Romero, and Talvi, 2007; Osterholm and Zettelmeyer, 2008; Hernandez, 2013). Osterholm and Zettelmeyer (2008), for example, provide evidence supporting the idea that the region is highly sensitive to external shocks. The study suggests that between 50 and 60 percent of the variation in Latin American annual GDP growth is accounted by external shocks. Furthermore, in the spirit of the specific relationship between the United States and Latin America, Canova (2005) finds that the role of domestic shocks in producing output fluctuations in Latin America is minor in comparison to role of the US shocks. Moreover, the role of external shocks seems to be common for the region. For instance, Aiolfi, Catao, and Timmermann (2011) observe a noticeable commonality of cyclical fluctuations across Argentina, Brazil, Chile and Mexico, and highlight the importance of external global factors in explaining the common regional cycle.

The trade collapse during the Great Recession and the potential growth spillover effect on Latin America from the US, as part of the role of external-related determinants of the Latin American output fluctuations, may be understood in a common context, given the vast literature on the determinants of business cycles synchronization (Kose and Yi, 2001; Baxter and Kouparitsas, 2003; Baxter and Kouparitsas, 2005; Calderon, Chong, and Stein, 2006; Di Giovanni and Levchenko, 2010; Ng, 2010; Artis and Okubo, 2011; Jansen and Stokman, 2011). A long standing result in this literature is the predominant role of trade. For example, Baxter and Kouparitsas (2005) find that bilateral trade between countries is the only robust determinant of business cycles co-movement; Di Giovanni and Levchenko (2010) claim that countries that trade more with each other display a higher business cycle correlation; Fidrmuc and Korhonen (2010), studying the effects of the global financial crisis on emerging economies, find a significant correlation between trade and GDP growth rates between emerging Asian countries and OECD countries.

Given the importance of the trade channel in the literature on business cycles, and the role of the US as the most important (on average) export market for the region, studies of Latin American economies must highlight the role of the United States. This aspect is clear, for example, in some contributions that focus on the Mexican case (Herrera, 2004; Miles and Vijverberg, 2011). Herrera (2004) finds, in fact, that Mexico and the United States share a common trend and a common cycle according to a time series analysis for the period 1993-2001. More recently, Miles and Vijverberg (2011) provide evidence supporting Mexico's business cycles synchronization with the US in the post- North American Free Trade Agreement (NAFTA) years. However, the particular case of Mexico, under this strong commercial integration, certainly may not be representative of the general story for Latin America.

Finally, in spite of the acknowledged role of the US economy in Latin American output fluctuations, literature on the role of the trade structure in the synchronization of the business cycles between Latin America and the US is not abundant. One exception is the contribution by Torres and Vela (2003), who suggest that trade integration, led by the manufacturing sector, is the main factor of convergence of the Mexican and the US business cycles. Another exception, although pointing in a different direction, is the work by Fiess (2007), a case study for Central America, which suggests that trade intensity and intra-industry trade are weakly correlated with the degree of business cycle synchronization.[8] Nevertheless, the evaluation of the short-run effects of the Great Recession on the Latin American economies, using an approach that builds on the literature on output fluctuations co-movement between Latin America and the US, with special attention on the trade-related mechanisms is missing in the literature.[9]

This paper proceeds by exploring four aspects with an econometric panel data analysis: (i) the correlation between Latin American and US output fluctuations, (ii) the role of primary and non-primary commodity exports, and the role of the dependence on the US export market, as amplifiers of a potential short-run growth spillover effect, (iii) if what a country exports to the US at the sectoral level impacts the growth spillover effect, and finally (iv) if

[8] This conclusion is, however, based on a simple correlation.

[9] Levy (2011) offers a wide description of different aggregates associated with the macroeconomic downturn (i.e. current account shocks, financial fragility, fiscal and monetary domestic policies). Interestingly, for the particular purpose of this paper, the report highlights the heterogeneity of the region's countries in terms of export markets destination. Nevertheless, the scope of this report is basically descriptive.

the observed Latin American performance in 2009 resembles the implications of the statistical analysis based on historical data. Following the literature on North-South decoupling, the analysis of the business cycle co-movement between Latin America and the United States controls for other geo-economic sources of output fluctuations. Although the US has been the most important engine for the world economy after World War II, and historically the most important trade partner for Latin American economies, the relative importance of the US as a source of external demand for Latin American output varies across countries, and may have changed over time. The econometric specification controls for the increasing influence of other developing economies, China among them, on Latin America. The next two sections develop the empirical strategy, section 4 provides a simple description to illustrate the econometric results in terms of the Latin American performance in 2009, and section 5 concludes.

2. Data and Econometric Strategy

The following baseline regression is used in order to examine the direct and contemporaneous effect of US short-run output fluctuations on the dependent variable: real GDP annual growth rate in Latin American economies (*GRGDP*):

$$GRGDP_{jt} = \alpha + \phi GRGDP_{jt-1} + \beta USA_t + \gamma ADV_t + \delta CHN_t + \lambda DEV_t + f_j + \varepsilon_{jt} \qquad (1)$$

The right hand side includes the lagged dependent variable $(GRGDP_{jt-1})$, controlling for persistence in the annual growth rates, and the key variable in this study: the US real GDP annual growth rate (*USA*). Moreover, Equation (1) includes the real GDP annual growth rates of three groups of economies: (i) Other advanced economies (*ADV*), (ii) China (*CHN*), and (iii) Developing economies, excluding China and Latin America (*DEV*). As discussed in Section 1, it is important to notice that this specification controls for the indirect effects of the US business cycles on Latin America through other economies. The omission of these other potential geo-economic sources of output fluctuations might lead to a biased estimate of the effect of the US GDP growth rates (β). For example, given the strong positive correlation between US and other advanced economies' GDP growth rates,[10] the omission of *ADV* may cause an upward bias of the estimate of β if *ADV* and *USA* are positively correlated with Latin America's annual growth rates. Equation (1) also includes country fixed effects (f_j) and

[10] The simple correlation of the annual GDP growth rates of the United States and Other Advanced Economies is 0.69 for the period 1961-2012.

the error term (ε_{jt}). Time fixed effects are obviously not included in this specification since the growth rates of the potential geo-economic sources are not different across Latin American economies.

The sample of Latin American economies includes 15 countries (LA-15): Brazil, Mexico, Argentina, Venezuela, Colombia, Chile, Peru, Ecuador, Dominican Republic, Guatemala, Costa Rica, Uruguay, El Salvador, Trinidad and Tobago, and Panama (ordered from largest to smallest size, according to the nominal GDP in US dollars in 2006). The total GDP of these economies correspond to 98 percent of the total Latin American GDP. Most of the excluded economies are Caribbean countries that make up a small share of total Latin American GDP. The dataset also includes a group of 20 other Advanced Economies (or Non-USA advanced economies); their annual GDP growth rate is given by *ADV* in Equation (1). These economies have been OECD members for more than forty years, and are part of the high-income OECD countries group defined by the World Development Indicators.[11] In regard to the Developing Economies (excluding China and Latin America), it is worth noticing that these economies are a subset of countries from the Non-USA advanced economies. The real GDP used in the calculation of *DEV* is simply the world's real GDP after subtracting the real GDP of: (i) the US, (ii) Other Advanced Economies, (iii) Latin America, and (iv) China. The World Development Indicators are the source for the economies' real GDP used in this study.

In addition to LA-15, Equation (1) is estimated to explore the effect of the US output fluctuations in two groups of subsamples: (i) "primary commodity" exporters and "non-primary commodity" exporters, and (ii) "high export to the US" countries and "low export to the US" countries. As mentioned in Section 1, the econometric analysis attempts to examine the role of the Latin American export structure, and specifically the role of exports oriented to the United States, as mechanisms for the synchronization between the US and the Latin American annual growth rates. The definition of primary commodity exporters is based on the ratio of primary exports to merchandise exports. Primary exports include the following categories: (i) agricultural raw materials, (ii) food, (iii) fuel, and (iv) ores and metal exports. For those Latin American countries classified as primary commodity exporters, the mean ratio in the period 1960-2012 was above the median ratio for the entire group of 15 Latin

[11] Since New Zealand's GDP in constant 2005 US$ is not available from 1960 to 1976 in the World Development Indicators, this is the only country that was excluded in the analysis despite New Zealand has been an OECD member since 1973, and it is a high-income OECD economy according to the WDI.

American economies in the same period (75 percent). The information from 1960 to 2012 to calculate the annual growth rates for the different groups of countries, and the ratio of primary exports to merchandise exports was obtained from the World Development Indicators (WDI). For the second subsample, the definition of a "high" or a "low export to the US" country is based on the ratio of exports to the US to GDP (*EXPUS_GDP*). Countries classified as "high export to US" have a mean ratio of exports to the US to GDP for the period 1960-2012 above the median for Latin America (4.42 percent). The United Nations COMTRADE dataset is the source of the information on exports from each Latin American economy to the US. The empirical examination uses the COMTRADE data at the sectoral level, which reports exports to the United States for 9 different sectors according to the Standard International Trade Classification (SITC). Table 1 summarizes the data definitions of the key variables and the respective sources

Besides its representativeness, the LA-15 sample displays a remarkable level of heterogeneity in export destination and the importance of primary commodity exports. Table 2 provides a picture of the main export markets of LA-15 in 2006. The economies were classified as primary or non-primary commodity exporters according to the ratio of primary exports to merchandise exports. In order to rank and list the most important export markets, Table 2 reports the ratio of exports to trade partner as a proportion of total exports. Listed markets for each LA-15 economy add up to at least 50 percent of the total exports in the particular Latin American economy. It is interesting to notice, for example, that only exports to the United States from countries like Mexico, Dominican Republic, Trinidad and Tobago, Ecuador, El Salvador, and Venezuela, account for more than 50 percent of their individual total exports. While some of them (Ecuador, Trinidad and Tobago, and Venezuela) are primary commodity exporters (basically oil exporters), others (Dominican Republic, El Salvador, and Mexico) export manufactured goods. On the other hand, Argentina, Brazil, Chile, and Uruguay display a relatively low degree of market (destination) concentration, although the US is still an important export market. Not surprisingly, some of the economies with many listed trade partners (Argentina, Brazil, Chile), which add up at least 50 percent of the total exports, have China as the most important export destination in the group of developing economies outside the region. Furthermore, Costa Rica and Peru, for which the US is the most important export market, have China in the list of main export markets as well. The importance of China is a recent development for Latin American economies. Figure 1, which displays the ratios of (i) Latin American exports to high-income economies to GDP and (ii) Latin American exports to

developing economies outside the region to GDP, shows that in 1960, exports to high-income economies accounted for 11 percent of the Latin American GDP, while exports to developing economies outside the region corresponded to 0.28 percent of the GDP. Figure 1 also shows that although trade liberalization has contributed to the increase of total exports as a proportion of GDP, exports to developing economies have been growing faster than exports to high-income economies. In 2006, exports to high-income countries accounted for 17.5 percent of LA's GDP (1.6 times the ratio in 1960), while exports to developing economies outside the region accounted for 2.4 percent of the Latin American GDP (8.3 times the ratio in 1960). However, as mentioned before, the United States remains the single most important destination for Latin American exports.

The coefficients in the baseline regression (equation (1)) are first estimated by Ordinary Least Squares (OLS), and then by General Method of Moments (GMM) estimators (Arellano-Bover and Arellano-Bond). The GMM estimators deal with a potential non-orthogonality of the error term, especially, in this case, as a result of the inclusion of the lagged dependent variable $(GRGDP_{jt-1})$. It is reasonable to assume that reverse causality is not likely to be a serious problem in this specification. Since Latin American countries are small economies in comparison to the US, Other Advanced Economies, China, and Developing Economies (excluding China and Latin America), the regressors *USA*, *ADV*, *CHN*, and *DEV* may be assumed as exogenous. For example, while a growth spillover effect from the US on Latin America is expected to occur, changes in the growth rates of a particular Latin American country are not likely to affect the US growth rates.

Figures 2 and 3 display the histograms of the annual growth rates for the sample of 15 Latin American economies and the US annual growth rates for the period 1961-2012 respectively. The average annual growth rate of the sample of Latin American economies is 3.9 percent, and the standard deviation is 4.4 percentage points. The distribution of Latin American countries' growth rates ranges from a minimum value of -13.4 percent (Panama, 1988) to a maximum value of 18.3 percent (Venezuela, 2004). For the United States, the average growth rate is 3 percent with a standard deviation of 2.2 percentage points. The distribution of US growth rates shows a minimum value of -3.2 percent, not surprisingly for year 2009, and a maximum value of 6.9 percent (1984). For both distributions, around 80 percent of the total numbers of observations lie between the mean and the mean plus/minus 2 standard deviations. Finally, in terms of this brief and preliminary examination of the data, the simple

correlation between the annual growth rates of Latin America and the annual growth rates of: (i) United States (*USA*), (ii) Other Advanced Economies (*ADV*), (iii) China (*CHN*), and (iv) Developing Economies, excluding China and Latin America (*DEV*) seems to confirm the importance of controlling for other potential sources of output fluctuations in the formal econometric analysis, since several of the annual growth rates of different groups of countries are strongly correlated. The three most remarkable correlations are between (i) *USA* and *ADV* (0.69), (ii) *ADV* and *DEV* (0.65), and (ii) the *USA* and *DEV* (0.47). It is worth noticing that the statistical inference, in particular the statistical significance test on the estimates, may be affected as a result of these correlations among the right hand side variables. However, this should be considered a strength of the econometric results, since estimates in the baseline regression are significant in spite of, not because of, the variance inflation (larger standard errors due to the multicollinearity).

3. Estimates

3.1. Baseline Regressions

Table 3 reports the results based on the baseline regression that estimates the co-movement between the annual real GDP growth in the Latin American economies and the annual real GDP growth in the United States, after controlling for other potential geo-economic sources of output fluctuations. This table includes: OLS estimates (Column (1)), and OLS estimates with country fixed effects (Column (2)). Given that Latin American countries resemble the assumption of open small economies in relation to the United States, and other large economies, the estimate associated with *USA* may be interpreted as the direct effect of US output fluctuations on the Latin American growth rates. However, as mentioned in the last section, GMM estimations are used to test the robustness of the OLS results and also to control for the possibility of non-orthogonal error terms due to the inclusion of the lagged dependent variable in the right hand side of the regression. Columns (3)-(5) in Table 3 report the Arellano-Bover General Method of Moments (GMM) and Arellano- Bond GMM estimates respectively, which use the lags of the right hand side variables and higher order lags of the dependent variable to instrument the contemporaneous growth rates and the lagged dependent variable $GRGDP_{jt-1}$.

In general, the outcomes from OLS estimations, with and without country-fixed effects (Columns (1) and (2)), are quite similar in magnitude and statistical significance. Moreover, the estimates seem to be robust to the GMM estimation (Columns (3) to (5)). Consistent with

the expectation that was discussed in Section 1, the estimate for the direct effect of the US output fluctuations on Latin American economies' annual GDP growth rates is positive and statistically significant in the GMM regressions, although it is not significant in the OLS regression with country dummy variables. For *USA*, the statistically significant estimates range from 0.16 (OLS with country fixed effects) to 0.19 (Arellano-Bover GMM). For the Arellano-Bond GMM estimate (0.17), the magnitude means that a one standard variation in the annual GDP growth rates in *USA* translates into 0.08 standard deviations of the Latin American growth rates. This effect corresponds to 0.4 percentage points of annual growth, which is around 10 percent of the mean of *GRGDP* (3.9 percent). This effect is noticeable since the baseline econometric specification is only focusing on external geo-economic sources of output fluctuations. Estimates associated with *DEV* (other developing economies) are positive and statistically significant at the one percent level in both OLS and GMM regressions. Furthermore, the effect associated with *DEV* is relatively more important than the effect associated with *USA*. A one standard variation of *DEV* would translate into a 0.6 percentage point variation in *GRGDP* (0.14 standard deviations). In the case of Other Advanced Economies and China, the estimates are positive but not statistically significant. These general results suggest that both *USA* and *DEV* have been direct sources of the Latin American output fluctuations in the period 1961-2012, and they highlight the role of the rest of developing countries in comparison to the United States.

3.2.Temporal Asymmetries and Export Structure

Examining the robustness of the estimates in temporal subsamples may provide interesting clarifying details. For example, it is reasonable to expect that the relative modest effect of *USA* in the time frame 1961-2012 is in part a response to a recent decoupling between Latin American economies and the US, characterized by the outstanding macroeconomic performance of China and other developing economies in recent years. This hypothesis suggests that geo-economic sources of Latin American output fluctuations may have changed over time due to the appearance of new world demand engines. As a preliminary approach, the baseline regression is applied to two temporal subsamples: (i) 1977-2012, and (ii) 1961-2000. The first time frame was determined according to the Chinese's annual growth rates time series, which display the beginning of an upward trend in growth rates, and lower volatility since 1977. Furthermore, 1976 was the last year when China witnessed a negative annual growth rate. Although the overlapping is not ideal, the time period 1961-2000 fulfill two requirements: (i) to exclude the commodity price boom of the last decade that resulted in

part from the emergence of the Chinese economy as a new world economy engine, and (ii) to attempt to balance the number of observations with the number of observations in the first temporal subsample given the short time frame in the panel dataset.

The results provide some interesting additional details. Table 4 reports the Arellano-Bond GMM estimates for the baseline regression for the two temporal subsamples. The effect of *USA* is only statistically significant in the period 1961-2000. Indeed, in comparison to the estimate for the entire sample, the magnitude increases from 0.17 to 0.28. In terms of standardized coefficients, a one standard deviation variation of *USA*, in the period 1961-2000, translates into 0.6 percentage points of growth, an effect that is 50 percent higher than the effect estimated for the entire sample. For the same period (1961-2000), none of the other groups of countries' annual growth rates appear to be positive and significant correlates of the Latin American output fluctuations. This result confirms the unchallenged role of the United States as an external source of output fluctuations in Latin America before China and other developing economies had a more active role in the world economy. Moreover, for *DEV*, the estimate is negative and significant in the period 1961-2000 (Column (2)).

Contrary to the results for the period 1961-2000, the estimates for 1977-2012 result in China and other developing economies as winners of the horse-race regression as sources of Latin American output fluctuations.[12] The estimate of the effect of *USA* is not statistically significant, although close to the ten percent significance threshold. For this more recent time frame, a one standard variation of *CHN* translates into 0.4 percentage points of growth. It is worth noticing that this magnitude is similar to the effect of *USA* on the annual growth rates in Latin America over the entire time frame. Table 4 also shows that an increasing importance of China is not the only remarkable aspect in the results for the period 1977-2012; the effect of *DEV* turns to be positive, significant, and important in magnitude. A one standard deviation variation in *DEV* corresponds to 0.15 standard deviations of the annual growth rates in Latin America. This change corresponds to 0.6 percentage points of annual growth, a magnitude comparable to the effect of *USA* in the period 1961-2000.[13]

[12] Since 1979 is known as the year in when China began its trade openness, the period 1979-2012 was also examined. The Arellano-Bond estimates of the effects of *USA*, *ADV*, *CHN* and *DEV* are 0.15, -001, 020, and 0.33 respectively. The significance test results are very similar to those for the period 1977-2012.

[13] The Appendix displays the estimates of the effects of *USA*, *ADV*, *CHN* and *DEV* by using rolling window regressions for a window size of 36 years. This window size is meant to be able to capture the sample 1977-2012. However, other window sizes were examined. Results were very similar. The dynamic of these coefficients is consistent with the temporal sub-samples analysis. More recent years certainly seem to be characterized by a stronger South-South coupling. Given the confidence intervals, it is worth noting that while

Estimates of the annual GDP growth rates correlations between the US and Latin America may also be sensitive to the structure of exports in Latin American countries. For example, since the income elasticity of demand for primary goods is usually lower than the income elasticity for industrial goods, short-run variations in income in a large economy may especially affect export demand in non-primary commodity exporters.[14] Therefore, this mechanism may lead to a stronger synchronization of annual growth rates between the large and the small economy when the small economy is less dependent on primary commodities. Certainly, as described in the last section, Latin American countries, in general, have historically been primary commodity exporters. In fact, this aspect reflects the lack of industrialization, and the slow structural transformation toward high-productivity sectors in the region. However, the distribution of the ratio of primary exports to merchandise exports among Latin American economies does vary among Latin American economies. The mean of the ratio of primary exports to merchandise exports for each country in the Latin American sample ranges from 0.45 (Dominican Republic) to 0.95 (Ecuador). Table 4 also reports the Arellano-Bond estimates of the baseline regression for (i) primary commodity exporters (Ecuador, Venezuela, Chile, Peru, Panama, Trinidad and Tobago, Colombia, and Argentina), and (ii) non primary commodity exporters (Guatemala, Uruguay, Costa Rica, Brasil, El Salvador, Mexico, and Dominican Republic). As expected, annual growth rates in non-primary commodity Latin American exporters are more synchronized with the US annual growth rates. In fact, while the estimate for the effect of *USA* is not significant in the sample of primary commodity exporters, the estimate for non-primary commodity exporters (0.35) is more than twice the estimate for the entire sample (0.17). A one standard deviation variation of *USA* leads to a 0.19 standard deviations change in the non-primary Latin American exporters' annual growth rates. This change corresponds to 0.8 percentage points. Since the standard deviation of annual growth rates in the entire sample and the sample of non-primary commodity exporters is quite similar, the standardized effect is twice the estimated effect for all the 15 countries as well. The only additional regressor with a positive and statistically significant coefficient is *DEV*. Indeed, the estimate associated with *DEV* is significant in both subsamples; however, the magnitude of the effect is greater in the case of primary commodity exporters. A one standard deviation variation in *DEV* translates into 0.4 percentage points of

the estimated effects of *CHN* and *DEV* are increasing, the effects of *USA* and *ADV* are statistically very similar along time.

[14] This mechanism is certainly more complex and may involve, for example, differences in the price elasticity of supply. A formal theoretical framework is beyond the scope of this study; however, future work on this topic might be interesting.

annual growth in non-primary commodity exporters, while the effect doubles in primary commodity exporters.

In general the econometric analysis based on the temporal and export-structure subsamples provide two main findings regarding the question on the co-movement of short-run output fluctuations between the US and Latin America that were not explicit in the baseline regression for the entire sample. First, the United States was relatively a more important geo-economic source of Latin American output fluctuations before the 2000s. Second, non-primary commodity exporters in Latin American display a more synchronized output co-movement with the US.

3.3. Exporting to the US

While Section 3.2 dealt with the uneven effects of the US output fluctuations on the Latin American annual growth rates, over time and depending on export structures, this section attempts to pin down the importance of US-bound exports in explaining the previous results. Do Latin American countries that export more to the United States exhibit a stronger co-movement of output fluctuations with the US? As mentioned in the Section 1, a vast literature has identified the key role of bilateral trade as the main mechanism that links output fluctuations in a pair of countries (or groups of countries). However, in the context of a Center-Periphery relationship, where an individual small Latin American economy hardly affects the business cycles in the large United States economy, the role of bilateral trade may be simplified to the role of exports to the United States. Economies that depend more on the US export market may be more sensitive to US-originated income shocks. This question is tackled using three strategies. First, the baseline regression is estimated for two new subsamples: (i) "high-export to US" countries, and (ii) "low-export to US" countries. In order to define the subsamples, the distribution of the ratio of exports to US to total GDP (lagged two years) for all Latin America is used. The distribution of this ratio ranges from Argentina (0.9 percent) to Trinidad Tobago (27 percent). The sample of "high-export to US" countries include besides Trinidad and Tobago: Mexico (11 percent), Costa Rica (10.7 percent), Dominican Republic (10.5 percent), Guatemala (5 percent), and two well known South-American oil exporters, Venezuela (11 percent) and Ecuador (7 percent).

The second strategy consists of including in the baseline regression an interaction term between the US annual growth rates and the second order lag of the ratio of exports to US to GDP: $\gamma(USA_t * EXPUS\_GDP_{jt-2})$. Therefore, the total effect of *USA* now corresponds to

$\beta+\gamma*EXPUS\_GDP_{jt-2}$. This specification allows for the effect estimated in the baseline regression may be amplified or dampened by the ratio of exports to the US to GDP. This specification will certainly be affected by the multicollinearity between *USA* and the new interaction term. However, it is still possible to explore the robustness of the effect associated with the US annual growth rates if at least one of the two terms suffering from potential variance inflation remains statistically significant.

Finally, the third strategy attempts to expand on the insights that the interaction term may provide. This time, the interaction term uses sectoral level information, following the Standard International Trade Classification (SITC), to identify whether particular US-oriented export sectors have a more important role as a mechanism linking the annual growth rates between the US and Latin America. The SITC classification consists of nine main sectors: Food and Live Animals (SITC 0), Beverages and Tobacco (SITC 1), Crude Materials, Inedible, Except Fuels (SITC 2), Mineral Fuels, Lubricants and Related Materials (SITC 3), Animal and Vegetable OILS, Fats, and Waxes (SITC 4), Chemicals and Related Products (SITC 5), Manufactured Goods Classified Chiefly by Material (SITC 6), Machinery and Transport Equipment (SITC 7), and Miscellaneous Manufactured Articles (SITC 8). SITC 9 is a residual account for Commodities and Transactions not Classified Elsewhere in the SITC. Therefore, for example, the interaction term $USA_t*EXPUS\_1\_GDP_{jt-2}$ includes the ratio of exports of Beverages and Tobacco to the US as a proportion of GDP rather than the ratio of total exports to US to GDP. The nine sectoral interaction terms are: $USA_t*EXPUS\_0\_GDP_{jt-2}$, $USA_t*EXPUS\_1\_GDP_{jt-2}$,…$USA_t*EXPUS\_8\_GDP_{jt-2}$ for each SITC sector respectively.

Using the first strategy, Table 5 reports the Arellano-Bond GMM estimates for the two subsamples ("high-export to US" and "low-export to US") and their intersection with the entire time frame sample and the subsamples examined in Section 3.2 (1961-2000, 1977-2012, primary commodity exporters, and non-primary commodity exporters). It is worth noticing, in particular for the last intersection, that "high-export to US" countries are mostly non-primary commodity exporters, while low-US exports economies are usually primary commodity exporters. For the effect of *USA*, results in Table 5 are not conclusive when the entire time frame is used. However, the estimate is positive and significant in three subsamples: (i) low- export to US and the period 1961-2000 (Column (3)), (ii) high-export to

US and the period 1961-2000 (Column (8)), and (iii) high- export to US that are non-primary commodity exporters (Column (10)). The magnitude of the estimates in the first two cases are very similar to the results found for the temporal subsample 1961-2000 without the distinction of high or low exports to the US. However, the coefficient for the third case is 0.45, higher in comparison to the coefficient in the column (4) of Table 4 (0.35). A one standard deviation change in *USA* translates now into a one percentage point of annual growth in Latin America (0.22 standard deviations of *GRGDP*). In regard to the other groups of countries, the results are also consistent with the findings in previous sections. However, the results make clear that the estimate for *CHN* is positive and statistically significant in the period 1977-2012, mostly for countries that are less dependent on the US as an export market in relation to their GDP (Column (2)). In the case of *DEV*, the estimates also show a robust and significant positive effect in the entire sample (Columns (1) and (6)), mostly explained by the temporal subsample 1977-2012 (Columns (2) and (7)). Especially for primary commodity exporters, with a high ratio of US-bound exports to GDP, the role of DEV has been particularly important, although the coefficient for primary commodity exporters with a low ratio of exports to US to GDP is nearly significant at the 10 percent level (Column (4)).

Table 6 shows the estimates after implementing the second strategy, in which the aggregate interaction term $\gamma * USA * EXPUS\_GDP_{jt-2}$ is included in the baseline regression. The estimates for *USA* are not statistically significant probably due to the multicollinearity; however, the interaction term is positive and significant in two subsamples that had earlier reported a significant effect of *USA* before: (i) entire time frame, and (ii) non-primary commodity exporters. In terms of annual growth rates, a one standard deviation variation in the interaction term corresponds to 0.6 and 0.9 percentage points of Latin America's growth rates for the entire time frame and for the group of non-primary commodity exporters respectively. This effect, in comparison to the estimates of the coefficients associated with *USA* in the original baseline regression (Table 3) certainly suggest an amplified effect in the output fluctuations co-movement as a result of exporting to the United States. More interestingly, the effect of the interaction term is also positive and significant for the recent years (period 1977-2012). It is worth mentioning that this is a period in which the estimates for *USA* had not been significant in previous results. A one standard deviation variation in the interaction term translates into 0.6 percentage points of Latin America's annual rates of growth. The effects of *CHN* and DEV are robust and consistent with previous estimations.

Finally, results for the third strategy, which examines the role of exporting to the US at the sectoral level as an amplifier of the output fluctuations synchronization between Latin America and the US, are reported in Table 7. The interaction terms for the sectors SITC 1 (Column (2)), SITC 2 (Column (3)), and SITC 5 to 8 (Columns (6) to (9)) are positive and statistically significant, indicating a possible amplifying effect from these sectors. However, Figure 4 provides a comparison of the effects of a one standard deviation variation in these six sectoral interaction terms on the annual percentage growth rates in Latin America. This figure, which also includes the effect of the aggregate interaction term (including all the exports to the United States as a proportion of GDP), makes clear that the most important amplifying effect is associated with the sector SITC 6, which correspond to manufacturing exports to the United States (Manufactured goods classified chiefly by material). The standardized coefficient, associated with the sector SITC 6, is more than twice the coefficient associated with the aggregate interaction term. This result clearly complements and confirms the previous findings that output fluctuations are especially correlated between the US and non-primary commodity exporters in Latin America.

4. Latin American performance in 2009

The econometric results based on historical data are consistent with the uneven performance of Latin American economies in 2009. Figure 5 shows the average annual GDP growth rates for Latin America in 2009[15] for six groups of countries defined by the export-structure indicators used in section 3.[16] The average annual growth rates have been organized from the lowest (left) to the highest (right) in Figure 5. In fact, consistent with the results in section 3, (i) non-primary commodity exporters, (ii) countries more specialized in the US market, and (iii) countries where the US-bound manufactured exports are high as proportion of the GDP witnessed, on average, lower annual GDP growth rates in 2009 than the alternative groups. Figures 6 to 8 show the scatter plots of the simple correlation between the annual growth rates in 2009 and those export-structure indicators in year 2007. These figures display (i) a positive correlation between the ratio of primary commodity exports to merchandise exports in 2007 and the annual growth rates in 2009, (ii) a negative correlation between the ratio of exports to US to GDP in 2007 and the annual growth rates in 2009, and (iii) a negative

[15] The UN-COMTRADE dataset does not report Venezuelan exports to the United States in 2007, and the World Development Indicators do not report the annual GDP growth rate for Argentina in 2009. In order to preserve the comparability of the groups, this last section only refers to the 13 remaining Latin American economies.

[16] Categories were defined with the same ratios used in the econometric analysis (ratios for year 2007 in this case)

correlation between the ratio of manufacturing exports to the US to GDP in 2007 and the annual growth rates in 2009. Mexico and Costa Rica illustrate a combination of features leading to a strong transmission of the US shock in 2009, and hence a negative annual growth rate: relatively low exports of primary goods, relatively high exports oriented to the US, and relatively high manufacturing exports oriented to the US. Although the annual growth rates for these two countries in 2009 diverge, there are also quantitative differences regarding their export-structure indicators. For example, while manufacturing exports to the US as a proportion of GDP is 1.7 percent for Mexico, the same ratio is 0.9 percent for Costa Rica. The countries that faced less dramatic consequences of the US output shock in 2009, such as Colombia, Uruguay, and Panama, seem to follow the general implications from the econometric results as well. These three countries are primary commodity exporters, with a low ratio of total export to US to GDP, and a low ratio of manufacturing exports to US to GDP.

None of the countries with an annual growth rate below the Latin American median (0.5 percent) faced the combination of at least two of the favorable export-related indicators in terms of the performance in 2009; however, Dominican Republic is a case that clearly deviates from the general pattern. This is the only non-primary commodity, US export market destined, with a high proportion of manufacturing exports oriented to the US market that grew above the Latin American median.[17]. This country offers an interesting case study to examine, in future work, given its resilience in 2009.

5. Concluding Remarks

This paper contributes to the literature in two main aspects. First, it identifies and measures the business cycle synchronization between Latin America and the United States. Second, it provides evidence suggesting that this synchronization may be amplified by elements related to the Latin American export structure: (i) primary vs. non-primary commodity exports, (ii) the importance of the United States as an export market, and (iii) the role of manufacturing exports to the United States. This approach is useful to have a better understanding of the uneven performance, in terms of annual GDP growth rates, of Latin American economies during the Great Recession in 2009.

[17] Dominican Republic had been growing at rates above the 8 percent from 2005 to 2007.

The econometric evidence in this paper suggests the existence of an output fluctuation co-movement between the United States and Latin America. The estimates for the effect of a one standard deviation variation in the US' annual GDP growth rates on the annual GDP growth rates in Latin America range from 0.4 percentage points of annual growth, for the entire sample (LA-15) to a 1 percentage point, for a subsample including countries that are non-primary commodity exporters with a high ratio of exports oriented to the United States as a proportion of GDP. These magnitudes are noticeable since the average Latin American annual growth rates, for LA-15, and for non-primary commodity exporters with a high proportion of GDP exported to the United States, are 3.9 percent and 3.2 percent respectively. These results control for other external geo-economic sources of the Latin American business cycle: Other Advanced Economies, China, and Other Developing Economies. Interestingly, a temporal subsample analysis suggests a transition in the main external source of Latin American output fluctuations from the United States toward China and Other Developing Economies in recent years. However, this evidence, which supports the idea of business cycle decoupling among South-North economies, is attenuated when the regressions control for the role of US-bound exports as a potential amplifier of the business cycle synchronization, through an interaction term between annual US GDP growth rates and the ratio of exports to US to GDP. In fact, the estimate associated with this interaction term, for the period 1977-2012, is positive and statistically significant while the effects from China and Other Developing Economies are positive and statistically significant as well.

The particular co-movement between non-primary commodity Latin American exporters and the United States, especially for "high-export to US" Latin American countries, may be a consequence of mechanisms regarding the export demand for Latin American output in the United States. In a basic Center-Periphery context, where the US is a large economy while each individual Latin American economy is small, US income shocks may unevenly translate into Latin American output shocks, depending on the export structure. For example, if the income elasticity of US demand is higher for non-primary goods than for primary ones (i.e. oil and minerals), the external demand for the former is more sensitive to US income shocks than the external demand for latter. In this case, non-primary commodity exporters would witness a more severe shock during a US recession than primary commodity exporters. However, another possibility is that given that the non-primary commodity export supply is more elastic than the primary commodity export supply, non-primary commodity exporters face a more rapid output adjustment as a consequence of the US income shock. A theoretical

model including these aspects, and certainly the indirect effects of the price adjustments (i.e. effects on terms of trade) on the Latin American output is an important task for future research. As a step forward to continue the evaluation of this hypothesis, the interaction term between annual US GDP growth rates and the ratio of exports to US to GDP was disaggregated into 9 sectors, according to the Standard International Trade Classification (SITC). The results of implementing this econometric strategy suggest that Latin American economies with a higher level of manufacturing exports as a proportion of the GDP display a stronger co-movement with the United States.

Finally, the uneven distribution of Latin American annual growth rates in 2009 fits the findings based on historical data. On average (i) non-primary commodity exporters, (ii) countries with a higher ratio of US-bound exports to GDP, and (iii) countries with a higher ratio of US-bound manufacturing exports to GDP, witnessed lower annual growth rates than Latin America as a whole.

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Table 1: Data and Sample definitions

CODE	DEFINITION	SOURCE	COVERAGE
GRGDP	Annual growth rate of real GDP	Authors' calculations based on WDI	1961-2012
USA	Annual growth rate of United States' real GDP	Authors' calculations based on WDI	1961-2012
ADV	Annual growth rate of 20 advanced economies' real GDP	Authors' calculations based on WDI	1961-2012
CHN	Annual growth rate of China's real GDP	Authors' calculations based on WDI	1961-2012
DEV	Annual growth rate of non-advanced economies' real GDP (excluding Latin America and China)	Authors' calculations based on WDI	1961-2012
EXPUS_GDP	Total exports (SITC from 0 to 9) destined for the United States as a proportion of GDP	Authors' calculations based on WDI (for GDP) and UN-COMTRADE (for sectorial exports to the US)	1960-2012
OTHER ADVANCED ECONOMIES (20 countries, excluding USA)	Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.		
LATIN AMERICA (15 countries)	Brazil, Mexico, Argentina, Venezuela, Colombia, Chile, Peru, Ecuador, Dominican Republic, Guatemala, Costa Rica, Uruguay, El Salvador, Trinidad and Tobago, and Panama		
PRIMARY COMMODITY EXPORTERS	Argentina, Chile, Colombia, Ecuador, Panama, Peru, Trinidad and Tobago, and Venezuela		

Table 2: Main export markets for LA-15, 2006

LA-15 countries	Primary commodity exporter	Exports to trade partner as a proportion of total exports (percentage points) Summary statistics		Main export markets and exports to trade partner as a proportion of total exports (percentage points)					
Argentina	yes	Mean	0.6	Brazil	17.7	China	7.6		
		Median	0.04	Chile	9.6	Spain	4.0		
		St. dev.	1.8	USA	9.0	Mexico	3.3		
Brazil	no	Mean	0.5	USA	17.6	Netherlands	4.2	Chile	2.9
		Median	0.03	Argentina	8.6	Germany	4.1	Japan	2.8
		St. dev.	1.5	China	6.1	Mexico	3.3	Italy	2.8
Chile	yes	Mean	0.6	USA	15.4	Netherlands	6.9		
		Median	0.005	Japan	11.0	Rep. of Korea	6.3		
		St. dev.	1.9	China	8.9	Italy	5.1		
Colombia	yes	Mean	0.6	USA	40.8				
		Median	0.007	Venezuela	11.5				
		St. dev.	3.2						
Costa Rica	no	Mean	0.8	USA	42.4				
		Median	0.01	China	7.7				
		St. dev.	3.9						
Dominican Republic	no	Mean	0.8	USA	66.7				
		Median	0.007						
		St. dev.	6.1						
Ecuador	yes	Mean	0.7	USA	53.7				
		Median	0.007						
		St. dev.	4.6						
El Salvador	no	Mean	0.9	USA	52.9				
		Median	0.008						
		St. dev.	5.3						
Guatemala	no	Mean	0.8	USA	31.4				
		Median	0.02	El Salvador	15.3				
		St. dev.	3.4	Honduras	9.7				
Mexico	no	Mean	0.5	USA	84.8				
		Median	0.001						
		St. dev.	6.0						
Panama	yes	Mean	0.9	Venezuela	19.7	Guatemala	5.5		
		Median	0.07	Colombia	16.0				
		St. dev.	2.7	USA	8.8				
Peru	yes	Mean	0.6	USA	21.9	Japan	6.2		
		Median	0.008	China	11.5	Brazil	4.1		
		St. dev.	2.1	Chile	7.2				
Trinidad and Tobago	yes	Mean	0.8	USA	58.1				
		Median	0.009						
		St. dev.	5.3						
Uruguay	no	Mean	0.6	Brazil	14.9	Russia	5.7		
		Median	0.03	USA	13.8	Chile	4.2		
		St. dev.	1.9	Argentina	7.7	Germany	4.2		
Venezuela	yes	Mean	1.0	USA	51.0				
		Median	0.008						
		St. dev.	5.3						

Table 3: Baseline regressions, 1961-2012

Dependent variable: *GRGDP* (Annual growth rate of real GDP per capita)[a]					
	(1) OLS	(2) OLS with country dummies	(3) GMM Arellano-Bover	(4) GMM Arellano-Bover with country dummies	(5) GMM Arellano-Bond
	LA-15	LA-15	LA-15	LA-15	LA-15
$GRGDP_{t-1}$	0.353***	0.325***	0.334***	0.323***	0.303***
	(7.88)	(6.02)	(11.28)	(10.56)	(8.47)
USA_t	0.181*	0.176	0.163*	0.188**	0.167*
	(1.79)	(1.53)	(1.76)	(1.98)	(1.71)
ADV_t	0.048	0.058	0.078	0.038	0.024
	(0.43)	(0.67)	(0.62)	(0.29)	(0.17)
CHN_t	0.012	0.013	0.039	0.035	0.029
	(0.40)	(0.44)	(1.28)	(1.12)	(0.90)
DEV_t	0.357***	0.356***	0.351***	0.354***	0.338***
	(3.45)	(4.84)	(3.80)	(3.75)	(3.31)
Sargan test (p-value)			0.01	0.04	0.05
AR(1) test			-3.46	-3.44	-3.48
p-value			0.00	0.00	0.00
AR(2) test			-1.31	-1.35	-1.34
p-value			0.19	0.18	0.18
Observations	729	729	729	729	684

[a](t -statistic), *p<0.10, **p<0.05, ***p<0.01.

Table 4: Regressions for temporal subsamples, and for primary vs. non-primary commodity exporters

Dependent variable: *GRGDP* (Annual growth rate of real GDP per capita)[a]				
	(1)	(2)	(3)	(4)
	GMM	GMM	GMM	GMM
	1977-2012	1961-2000	Primary	Non-primary
$GRGDP_{t-1}$	0.347***	0.236***	0.299***	0.283***
	(8.86)	(5.57)	(5.95)	(5.71)
USA_t	0.185	0.283***	-0.004	0.354***
	(1.54)	(2.65)	(-0.02)	(2.88)
ADV_t	-0.032	0.273	0.014	0.024
	(-0.20)	(1.39)	(0.07)	(0.14)
CHN_t	0.151**	0.001	0.049	0.009
	(2.48)	(0.04)	(1.02)	(0.23)
DEV_t	0.350***	-0.360**	0.442***	0.230*
	(3.41)	(-2.19)	(2.85)	(1.80)
Sargan test (p-value)	0.10	0.04	0.09	0.43
AR(1) test	-3.33	-3.44	-2.66	-2.26
p-value	0.00	0.00	0.00	0.02
AR(2) test	-1.92	-1.25	-1.78	0.67
p-value	0.05	0.21	0.07	0.51
Observations	504	510	362	322

[a](t -statistic), *p<0.10, **p<0.05, ***p<0.01. Arellano-Bond GMM regressions. Variables

Table 5: Regressions for "Low-export to US" and "High-export to US" countries

Dependent variable: *GRGDP* (Annual growth rate of real GDP per capita)[a]										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
Exports to US/GDP:	Low	Low	Low	Low	Low	High	High	High	High	High
	1961-2012	1977-2012	1961-2000	Primary	Non-primary	1961-2012	1977-2012	1961-2000	Primary	Non-primary
$GRGDP_{t-1}$	0.342***	0.350***	0.273***	0.290***	0.450***	0.219***	0.327***	0.133**	0.301***	0.097
	(7.12)	(6.51)	(4.85)	(4.51)	(6.49)	(4.21)	(5.58)	(2.17)	(3.74)	(1.47)
USA_t	0.159	0.160	0.289*	0.129	0.181	0.170	0.206	0.270*	-0.214	0.448***
	(1.17)	(0.93)	(1.87)	(0.68)	(1.00)	(1.24)	(1.24)	(1.89)	(-0.92)	(2.80)
ADV_t	-0.032	-0.088	0.244	-0.161	0.182	0.065	0.019	0.278	0.276	-0.045
	(-0.16)	(-0.37)	(0.86)	(-0.58)	(0.70)	(0.33)	(0.09)	(1.06)	(0.81)	(-0.20)
CHN_t	0.089**	0.252***	0.059	0.095	0.078	-0.039	0.036	-0.064	-0.023	-0.041
	(2.00)	(2.85)	(1.23)	(1.52)	(1.32)	(-0.87)	(0.43)	(-1.43)	(-0.30)	(-0.78)
DEV_t	0.293**	0.311**	-0.442*	0.330	0.215	0.409***	0.400***	-0.260	0.622**	0.236
	(2.04)	(2.09)	(-1.84)	(1.64)	(1.13)	(2.85)	(2.81)	(-1.17)	(2.53)	(1.42)
Sargan test (p-value)	0.05	0.12	0.06	0.15	0.22	0.36	0.36	0.37	0.43	0.2
AR(1) test	-2.63	-2.49	-2.60	-2.07	-1.69	-2.30	-2.16	-2.32	-1.65	-1.72
p-value	0.01	0.01	0.01	0.04	0.09	0.02	0.03	0.02	0.10	0.08
AR(2) test	-1.08	-1.38	-1.33	-1.70	1.33	-1.12	-1.48	-0.90	-0.84	-1.44
p-value	0.28	0.17	0.18	0.09	0.18	0.26	0.14	0.37	0.40	0.15
Observations	362	266	272	224	138	322	238	238	138	184

[a](t -statistic), *p<0.10, **p<0.05, ***p<0.01. Arellano-Bond GMM regressions.

Table 6: Regressions including the interaction term $USA_t * EXPUS\_GDP_{jt-2}$

Dependent variable: *GRGDP* (Annual growth rate of real GDP per capita)[a]	(1) GMM 1961-2012	(2) GMM 1977-2012	(3) GMM 1961-2000	(4) GMM Primary	(5) GMM Non-primary
$GRGDP_{t-1}$	0.318***	0.331***	0.245***	0.283***	0.354***
	(8.46)	(8.19)	(5.35)	(5.51)	(6.79)
USA_t	0.026	0.038	0.192	-0.140	0.164
	(0.23)	(0.27)	(1.45)	(-0.79)	(1.17)
ADV_t	0.051	-0.030	0.247	-0.032	0.078
	(0.34)	(-0.18)	(1.19)	(-0.14)	(0.45)
CHN_t	0.045	0.148**	-0.006	0.087	0.004
	(1.11)	(2.38)	(-0.13)	(1.44)	(0.08)
DEV_t	0.328***	0.328***	-0.303*	0.445***	0.162
	(3.20)	(3.10)	(-1.83)	(2.85)	(1.37)
$USA*EXPUS\_GDP_{t-2}$	1.807**	2.115**	1.042	1.524	3.986***
	(2.35)	(2.07)	(1.19)	(1.53)	(3.17)
Sargan test (p-value)	0.03	0.07	0.02	0.10	0.03
AR(1) test	-3.27	-3.15	-3.29	-2.56	-2.20
p-value	0.00	0.00	0.00	0.01	0.03
AR(2) test	-1.67	-1.73	-1.64	-1.86	0.65
p-value	0.09	0.08	0.10	0.06	0.51
Observations	578	473	409	324	254

[a](t -statistic), *p<0.10, **p<0.05, ***p<0.01. Arellano-Bond GMM regressions.

Table 7: Regressions including the sectoral interaction terms $USA_t * EXPUS\_GDP_{jt-2}$, 1961-2012

Dependent variable: *GRGDP* (Annual growth rate of real GDP per capita)[a]									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM	GMM
Z=	EXPUS_0_GDP	EXPUS_1_GDP	EXPUS_2_GDP	EXPUS_3_GDP	EXPUS_4_GDP	EXPUS_5_GDP	EXPUS_6_GDP	EXPUS_7_GDP	EXPUS_8_GDP
$GRGDP_{t-1}$	0.326***	0.317***	0.327***	0.308***	0.163***	0.300***	0.297***	0.319***	0.344***
	(8.68)	(7.69)	(8.68)	(7.40)	(3.54)	(7.59)	(7.83)	(7.85)	(8.54)
USA_t	0.094	-0.004	0.026	0.021	-0.103	0.080	-0.092	0.105	0.153
	(0.78)	(-0.03)	(0.21)	(0.17)	(-0.69)	(0.67)	(-0.78)	(0.85)	(1.28)
ADV_t	0.047	0.098	0.071	0.153	0.582***	0.046	-0.032	0.096	-0.008
	(0.31)	(0.58)	(0.47)	(0.91)	(2.96)	(0.28)	(-0.21)	(0.57)	(-0.05)
CHN_t	0.038	0.115*	0.046	0.079	0.145**	0.069	0.075*	0.093*	0.105*
	(0.92)	(1.93)	(1.11)	(1.48)	(2.39)	(1.37)	(1.71)	(1.66)	(1.78)
DEV_t	0.357***	0.284***	0.329***	0.335***	0.074	0.274***	0.307***	0.261**	0.312***
	(3.47)	(2.66)	(3.20)	(3.09)	(0.58)	(2.58)	(3.00)	(2.38)	(2.94)
$USA*Z_{t-2}$	3.102	125.049**	47.295**	0.495	-395.438	21.187***	52.930***	5.733*	8.351*
	(1.10)	(2.13)	(2.02)	(0.58)	(-0.67)	(3.66)	(5.19)	(1.91)	(1.88)
Sargan test (p-value)	0.03	0.04	0.02	0.06	0.02	0.08	0.03	0.07	0.06
AR(1) test	-3.28	-3.18	-3.32	-2.92	-2.65	-3.16	-3.28	-3.03	-3.18
p-value	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	0.00
AR(2) test	-1.58	-1.44	-1.68	-1.59	-0.92	-1.48	-1.88	-1.32	-1.71
p-value	0.12	0.15	0.09	0.11	0.36	0.14	0.06	0.19	0.09
Observations	574	464	559	448	354	507	542	475	489

[a](t -statistic), *p<0.10, **p<0.05, ***p<0.01. Arellano-Bond GMM regressions.

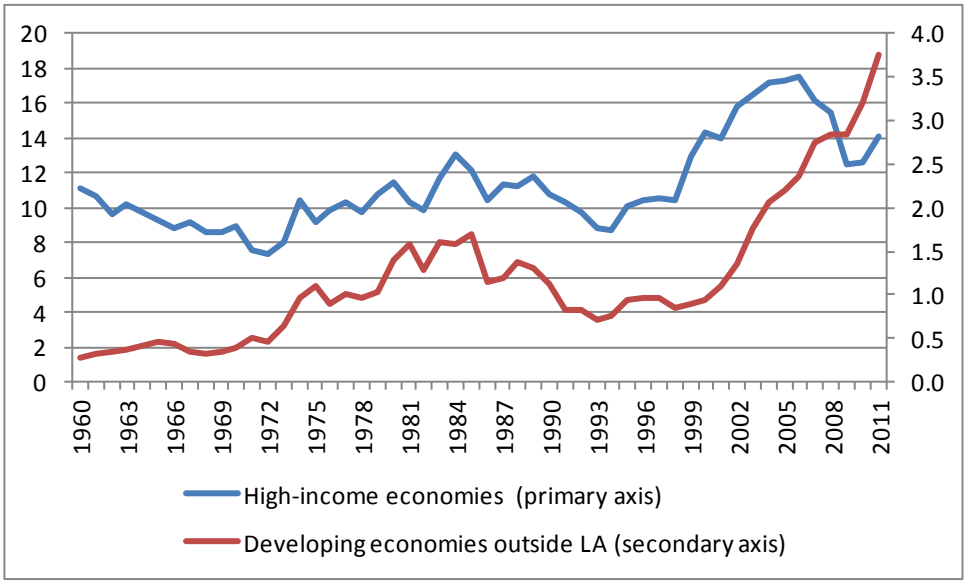

Figure 1: Latin American exports to High-Income Economies and Developing Economies outside the region (as a proportion of GDP, percentage points), 1960-2011. WDI and author's calculations.

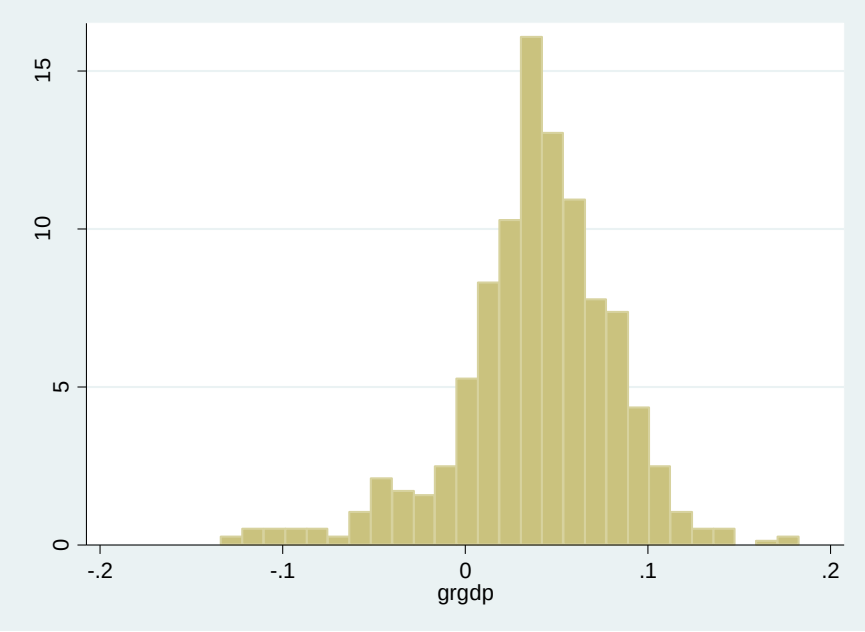

Figure 2: Histogram of the annual growth rates of GDP, LA-15, 1961-2012

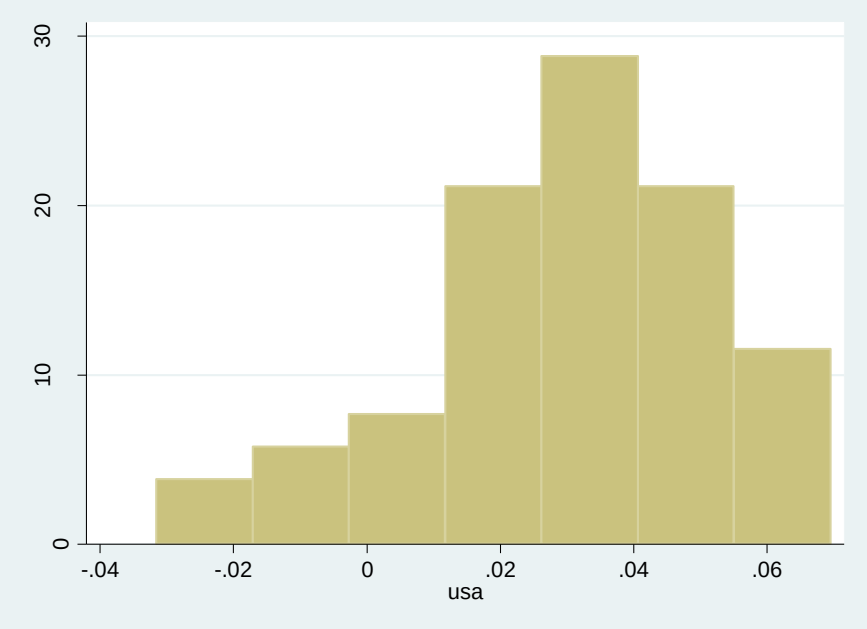

Figure 3: Histogram of the annual growth rates of US'GDP, 1961-2012

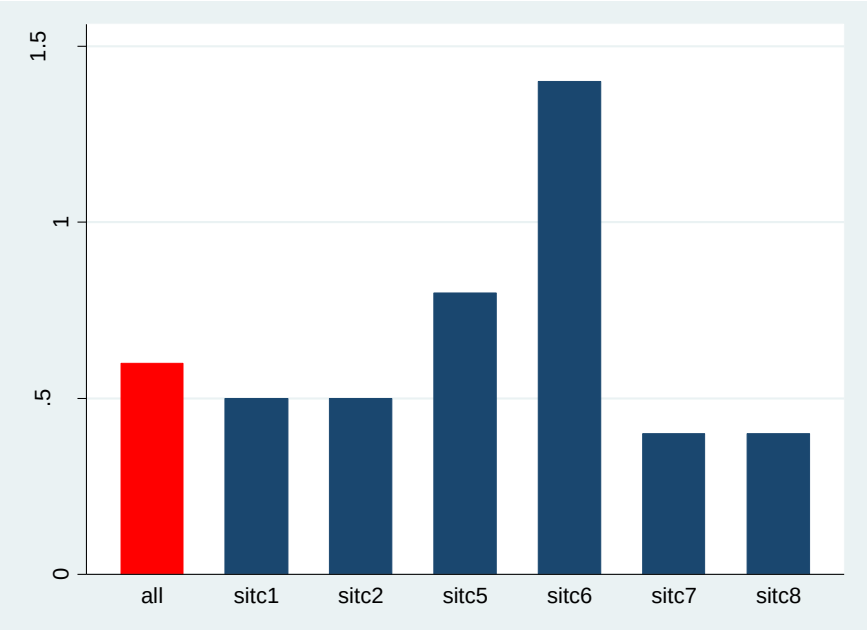

Figure 4: Effect of a one standard deviation variation in the interaction term $USA_t * EXPUS\_GDP_{jt-2}$, for selected SITC sectors, on Latin American annual growth rates (percentage points)

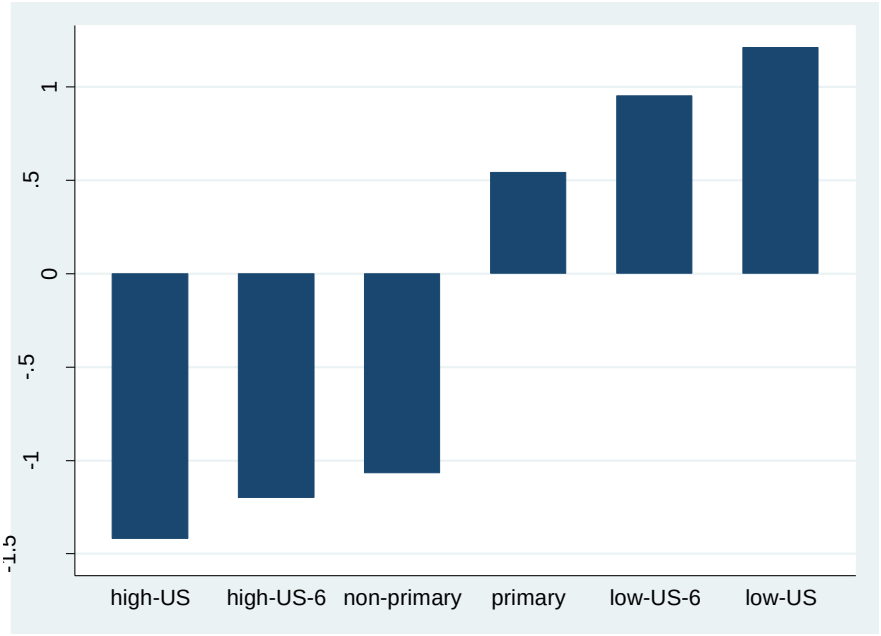

Figure 5: Average annual growth rate in 2009 for selected groups of Latin American economies (percentage points)

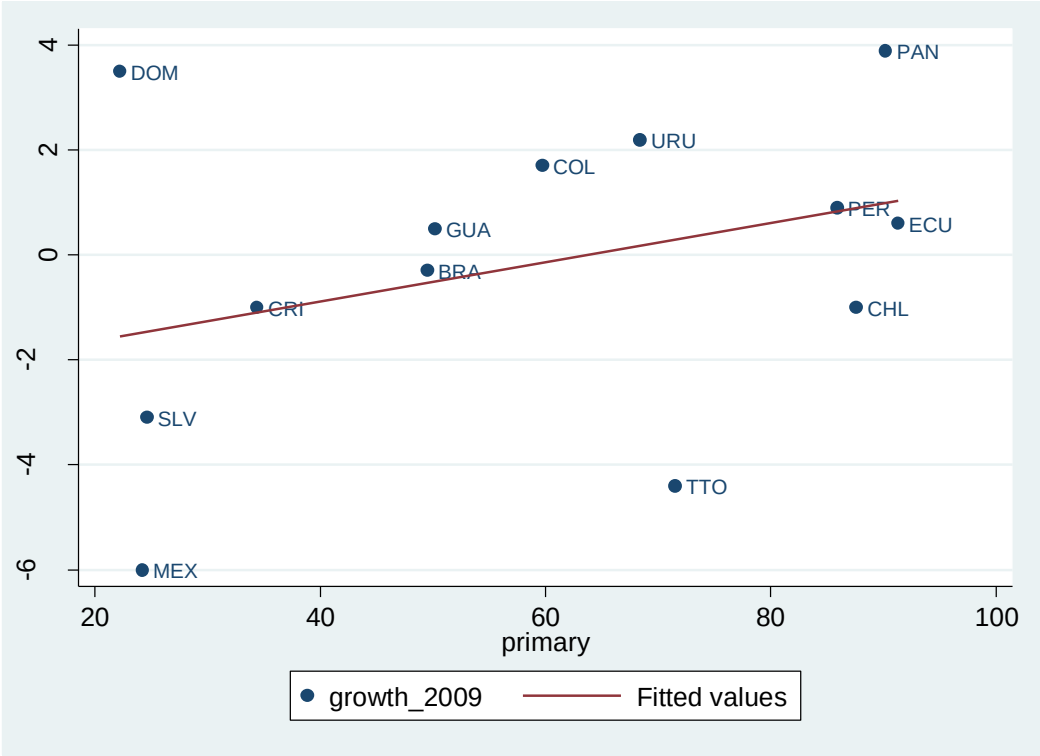

Figure 6: Scatter plot of Primary commodity exports/merchandise exports versus Annual growth rates in selected Latin American economies in 2009 (percentage points)

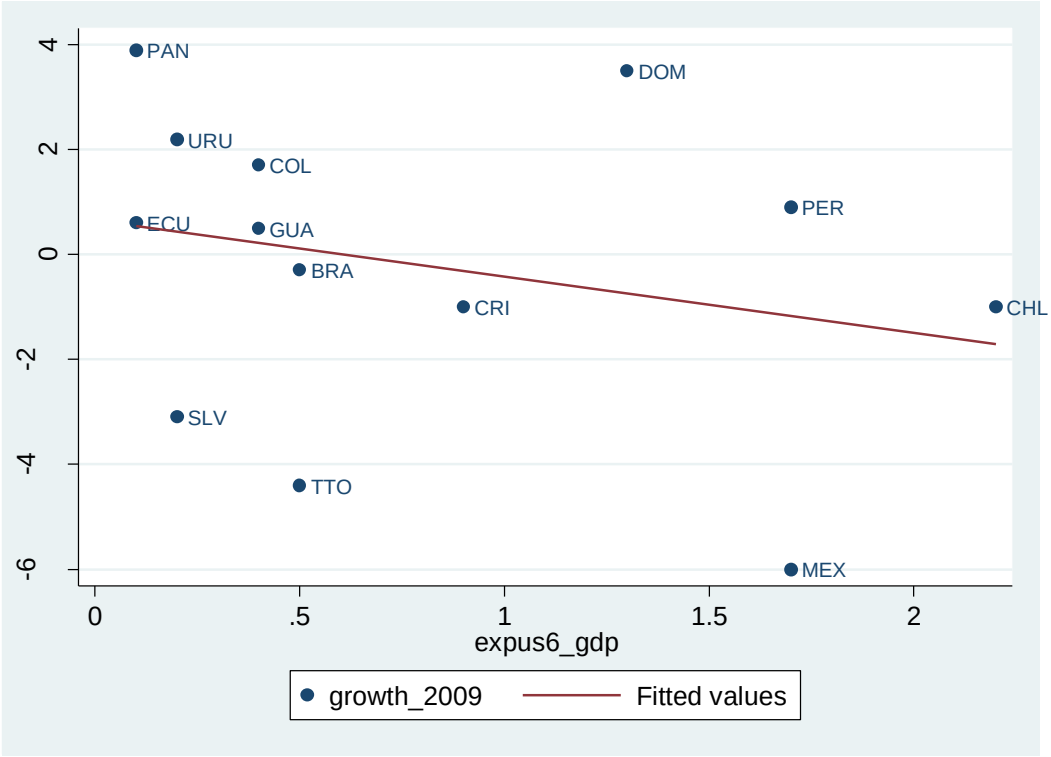

Figure 7: Scatter plot of Manufacturing Exports (SITC- 6) to the US as a proportion of GDP vs. Annual growth rates in selected Latin American economies in 2009 (percentage points)

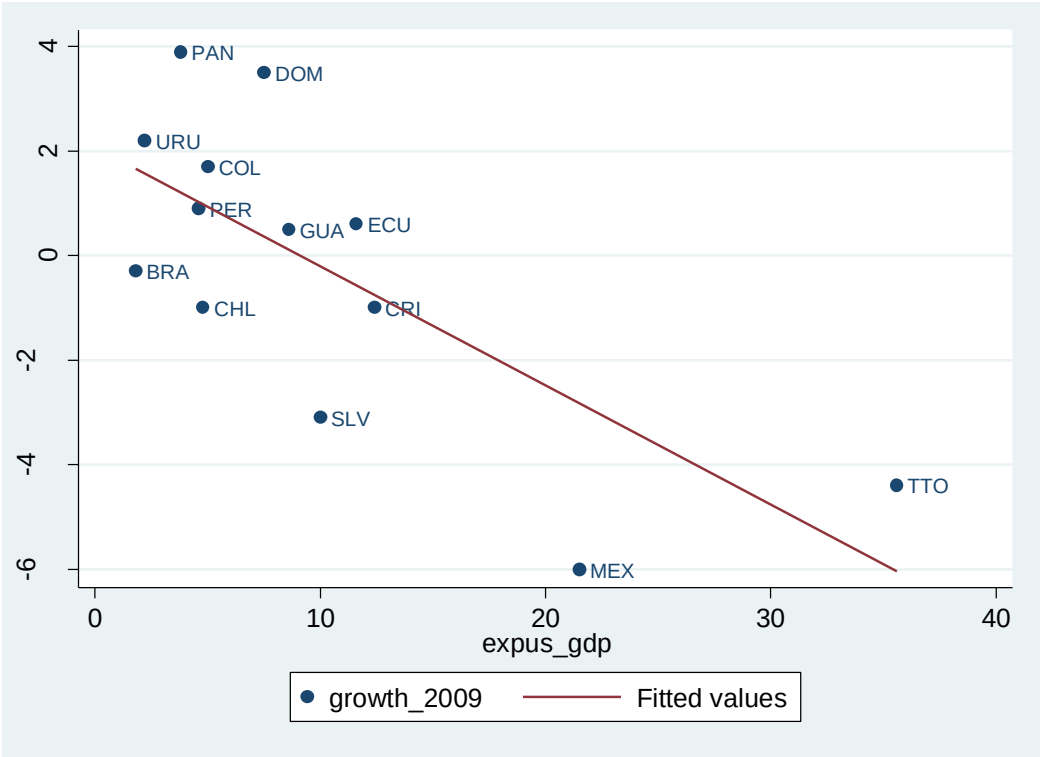

Figure 8: Scatter plot of Total Exports to US as a proportion of GDP vs. Annual growth rates in selected Latin American economies in 2009 (percentage points)

Appendix

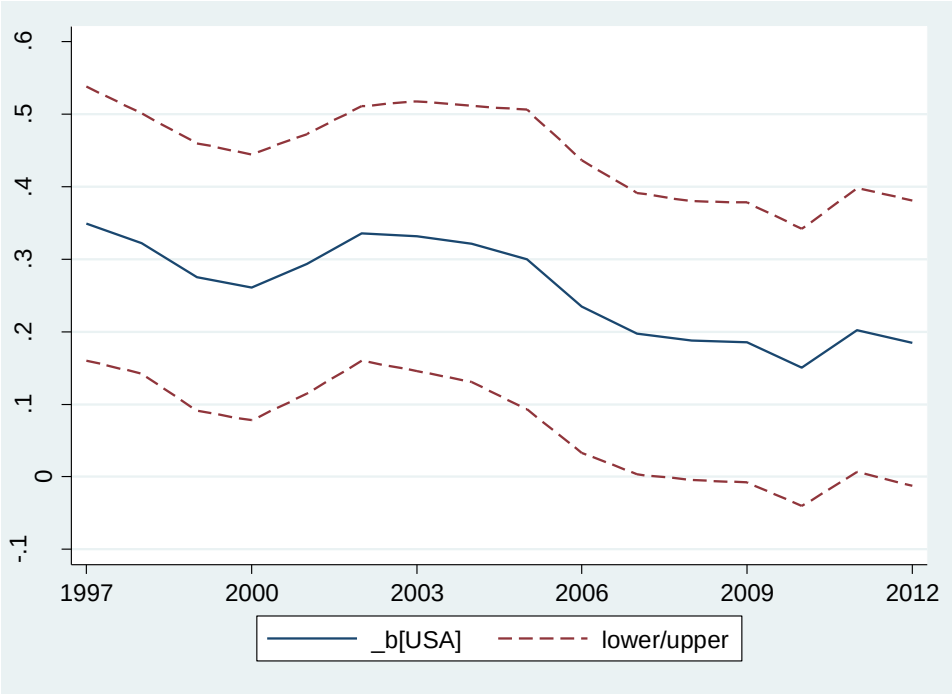

Figure A1: Estimate of the effect of *USA* (Rolling window regression, 36 years) on GRGDP. Lower/Upper defined by the 90 percent confidence interval. Year in the x-axis is the maximum year in the window.

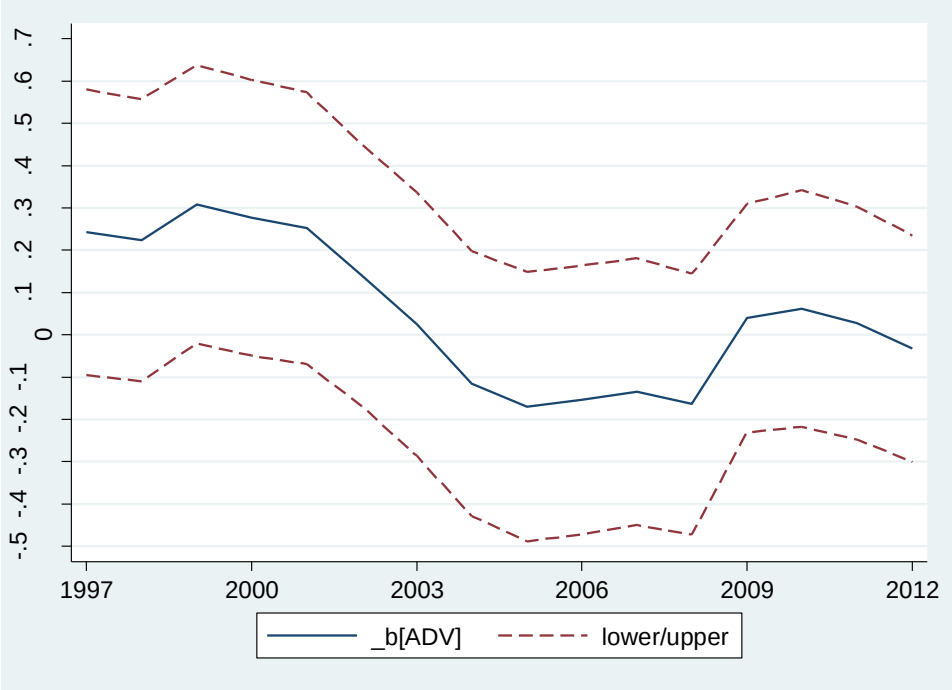

Figure A2: Estimate of the effect of *ADV* (Rolling window regression, 36 years) on GRGDP. Lower/Upper defined by the 90 percent confidence interval. Year in the x-axis is the maximum year in the window.

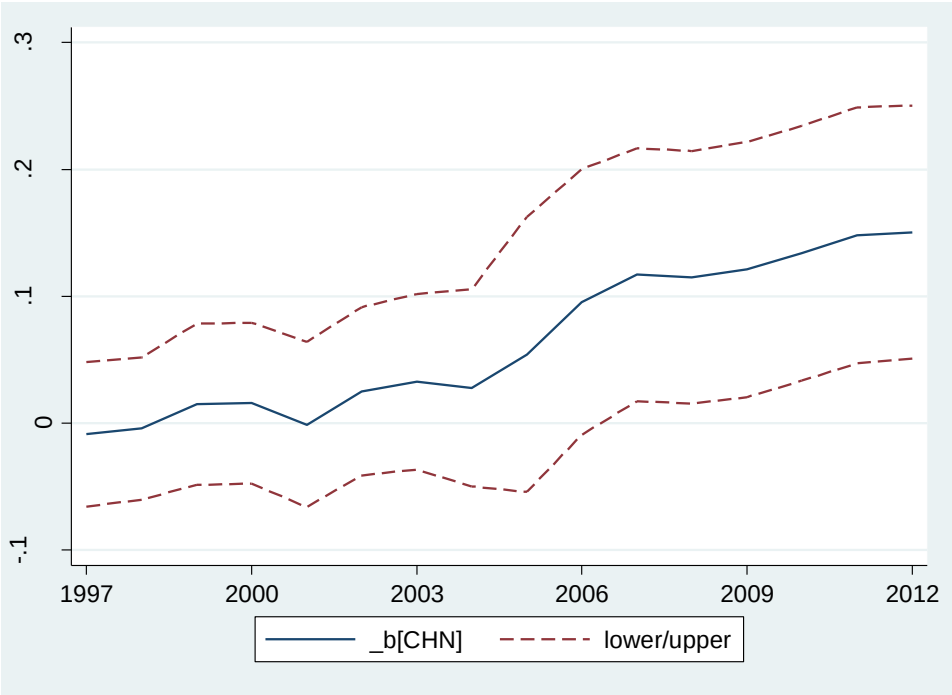

Figure A3: Estimate of the effect of *CHN* (Rolling window regression, 36 years) on GRGDP. Lower/Upper defined by the 90 percent confidence interval. Year in the x-axis is the maximum year in the window.

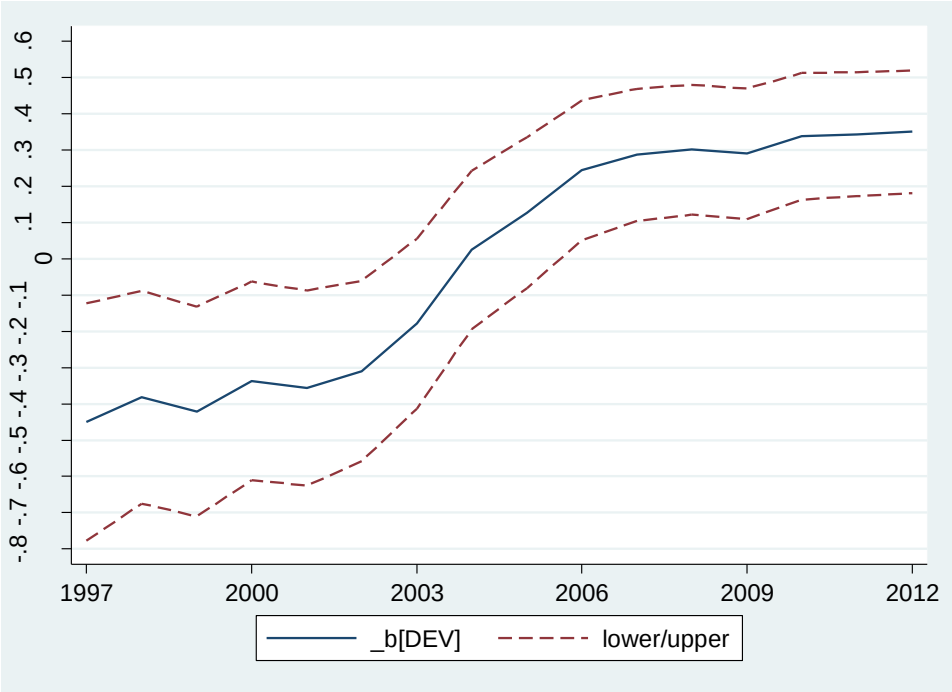

Figure A4: Estimate of the effect of *DEV* (Rolling window regression, 36 years) on GRGDP. Lower/Upper defined by the 90 percent confidence interval. Year in the x-axis is the maximum year in the window.