BANCO CENTRAL DE RESERVA DEL PERÚ

Global spillovers and coordination of monetary and macroprudential policies in the Pacific Alliance economies

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DT. N°. 2017-012
Serie de Documentos de Trabajo
Working Paper series
Diciembre 2017

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Abstract

In recent times the Pacific Alliance member economies (Chile, Colombia, Mexico and Peru) have managed to achieve trade integration, have made an important progress in their financial integration and have withstood the spillovers from the global shocks that had risen from abroad. But, would the Pacific Alliance members be better off if they coordinated their monetary and macroprudential policy responses when facing the spillovers from these external global shocks? To test this we propose a framework based on the Global Projection Model (GPM) of the International Monetary Fund (IMF), which features real and financial linkages between countries. We introduce additional equations for terms of trade, commodities, portfolio inflows, foreign direct investment inflows, lending, lending interest rates and macroprudential policy with the objective of having a more comprehensive model. In the no-coordination case, we consider six countries: the four member economies of the Pacific Alliance acting separately, China and USA. The coordination case involves three parties: the Pacific Alliance acting as one country, China and USA. In this case of full coordination among Pacific Alliance countries, the members act as if they followed the same monetary and macroprudential policies. We find that upon global shock spillovers coming from China and the United States, the Pacific Alliance members show lower aggregate welfare losses acting as a bloc rather than behaving separately.

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Resumen

Recientemente, las economías que integran la Alianza del Pacífico (Chile, Colombia, México y Perú) han logrado alcanzar la integración comercial, han hecho avances en su integración financiera y han podido sobrellevar los *spillovers* causados por los choques globales que han ocurrido fuera del bloque. Pero, ¿estarían los miembros de la Alianza del Pacífico mejor aún si ellos coordinaran sus respuestas de política cuando enfrentan *spillovers* de estos choques globales externos? Para responder esta pregunta se propone un marco basado en el Global Projection Model (GPM) del Fondo Monetario Internacional (FMI), que cuenta con vínculos reales y financieros entre países. Se consideran ecuaciones adicionales de términos de intercambio, commodities, flujos de inversión de cartera, flujos de inversión directa extranjera, créditos, tasas de interés de créditos y política macroprudencial con el objetivo de tener un modelo más comprehensivo. En el caso de no coordinación se consideran seis países: las cuatro economías de la Alianza del Pacífico, además de China y de Estados Unidos. El caso de coordinación considera a tres países: la Alianza del Pacífico actuando como un país, China y Estados Unidos. En este caso de coordinación entre los países de la Alianza del Pacífico, los miembros actúan como si siguieran la misma política monetaria y la misma política macroprudencial. Se encuentra que ante los choques globales que provienen de China y los Estados Unidos, las economías de la Alianza del Pacífico presentan menores pérdidas de bienestar social cuando coordinan sus respuestas de política que cuando no lo hacen.

1. Introduction

The Pacific Alliance is a trade bloc, established in 2012, that groups 4 of the most important economies within the Latin American region: Chile, Colombia, Mexico and Peru. According to the International Monetary Fund (IMF), these 4 economies accounted for 37% of the GDP of Latin America and the Caribbean in 2015, measured in US dollars at market exchange rates (40% if measured at purchase power parity exchange rates), making it, when considered as a bloc, the 8th most important economy in the world (7th if measured in US dollars at purchase power parity exchange rates).

The primary goal of the Pacific Alliance has been to achieve the trade integration of the 4 economies, based on their common history and economic frameworks. But, these countries have also made efforts to achieve the financial integration, through the Mercado Integrado Latinoamericano (MILA) or the Latin American Integrated Market, which provides an easy access from an investor from any of the member countries to investments in the other member's stock markets, thus making it possible for the members to share a common financial market.

In recent times, the Pacific Alliance member economies have managed to withstand the spillovers resulting from global shocks that have risen from outside, such as the present China economic slowdown and the beginning of the United States Federal Reserve monetary policy normalization. In escenarios like these, when a common global shock from outside the bloc occurs, is it convenient for the economies to coordinate their monetary and macroprudential policies? Even though it is more or less established that each country should follow their own monetary policies that respond to their very own challenges, there has been some recent discussion on whether Central Banks should coordinate their monetary policies, be them conventional or not (Kahn and Meade 2016, Mohan and Kapur 2014).

In this paper we propose a framework based on the Global Projection Model (GPM) of the IMF[1], which features real and financial linkages between countries. In addition to the original GPM structure, we introduce into the model equations for terms of trade, commodities, portfolio inflows, foreign direct investment inflows, lending, lending interest rates and macroprudential policy, in order to capture the transmission channels from the spillovers of the global shocks to the Pacific Alliance economies.

First, in order to identify the country-specific economic responses to the spillovers of global shocks, we consider a model with the 4 member economies of the Pacific Alliance, as well as those of China and the United States, which are the 2 most important economies in the world and also the main trade partners of the bloc. This is the case when the Pacific Alliance member economies do not coordinate their monetary and macroprudential policies. Second, we propose the same model, but considering only China, the Unites States and the Pacific Alliance as a bloc, for evaluating the case in which all the Pacific Alliance member countries behave as one in what can be understood as perfect monetary and macroprudential policy coordination among these countries. Afterwards, the impulse-response functions and the results of the calculations of welfare loss functions of both models are compared, in order to assess the difference in the spillover effects of global shocks to the

[1] For the base GPM models see Carabenciov et al. (2008a, 2008b, 2008c). For the following extensions see Canales Kriljenko et al. (2009), Carabenciov et al. (2013), Blagrave et al. (2013).

Pacific Alliance member countries, when evaluated as individual economies and when evaluated as a unified bloc, observing the intensity and the duration of the economic reactions.

We find that upon the arrival of spillovers caused by global shocks coming from China (negative demand shock, reserve requirements ratio raise shock, renminbi depreciation shock) and from the United States (negative demand shock, interest rate raise shock and credit crunch shock[2]), the Pacific Alliance member economies are mostly better off when coordinating policy responses among the member economies than when not. Only in the wake of a credit crunch shock in the United States we find that the Pacific Alliance member economies are slightly better off not coordinating than coordinating. Therefore, we conclude that coordination among the Pacific Alliance member economies could act as a buffer that helps to better absorb the global shocks that come from outside the bloc.

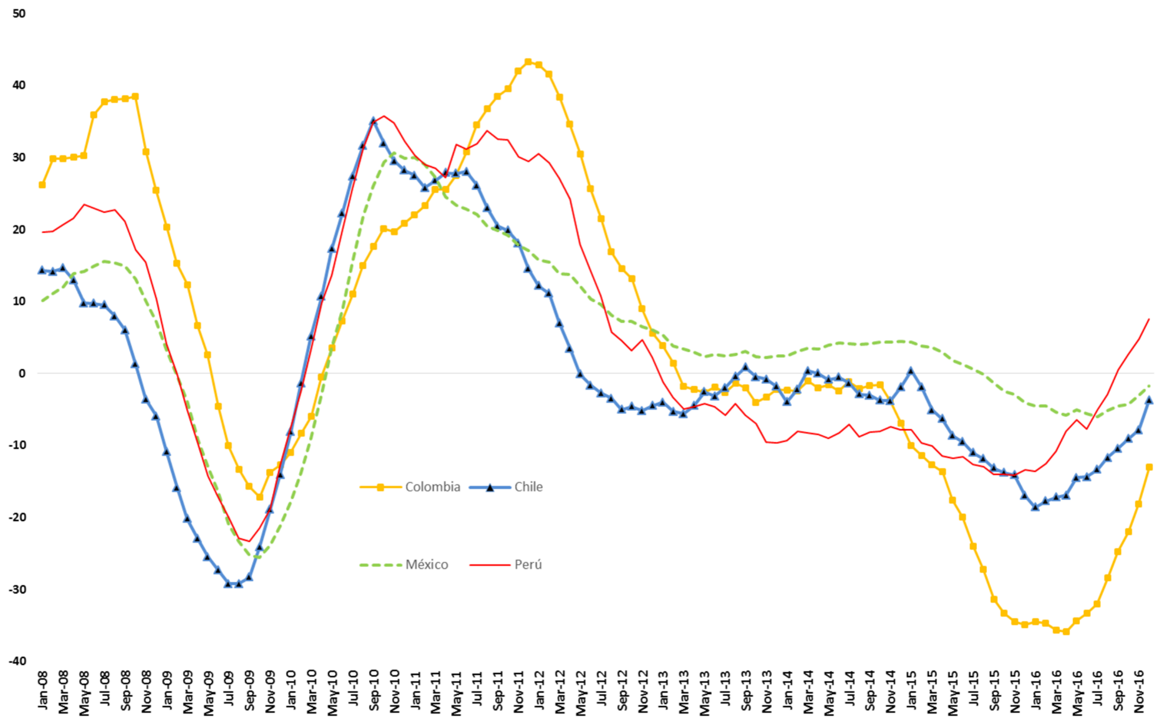
The next section explains what is the Pacific Alliance. The third section covers briefly the literature on the GPM models and trade blocs. The fourth section introduces the model, while the data is explained in the fifth section. On the sixth section we explain the results and finally we provide the conclusions on the seventh section.

2. What is the Pacific Alliance?

The Pacific Alliance is a trade bloc that groups the economies of Chile, Colombia, Mexico and Peru. It was established in 2012, with the Framework Agreement of the Pacific Alliance (Pacific Alliance 2012). The primary goal of the Pacific Alliance is to achieve the trade integration of the 4 economies, based on their common history and economic frameworks. Analyzing the exports of the 4 economies, it is notorious that there are similarities that have been preserved over time (see Figure 1).

[2]The credit crunch term refers to the situation in which the commercial banks of one country deliberately tighten their lending conditions, due to adverse macroeconomic conditions.

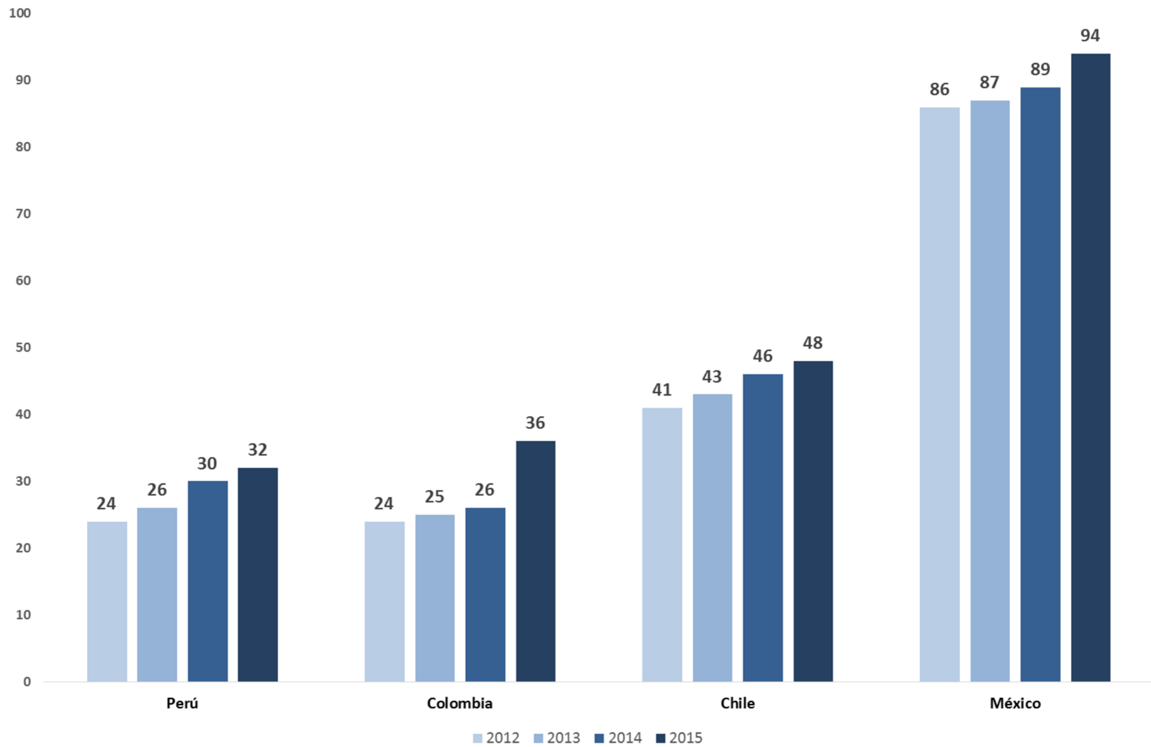
Figure 1: Total exports of Pacific Alliance member economies
(12-month cumulative % var.)



Source: UN Comtrade.

The member countries of the Pacific Alliance differ in the degree of diversification of their exports, measured as the percentage of non-traditional exports relative to total exports (see Figure 2). Peru and Colombia have a greater dependence on the traditional export sector, unlike Mexico, whose economy is much more diversified towards manufactures due to, among other factors, its proximity to the United States. One characteristic to highlight is the transition that has occurred in the composition of the member's exports, as the increase of non-traditional participation in recent years is evident. Thus, the economies of the Pacific Alliance have common characteristics, but in some cases they show a certain degree of heterogeneity, as in the productive and the export structures.

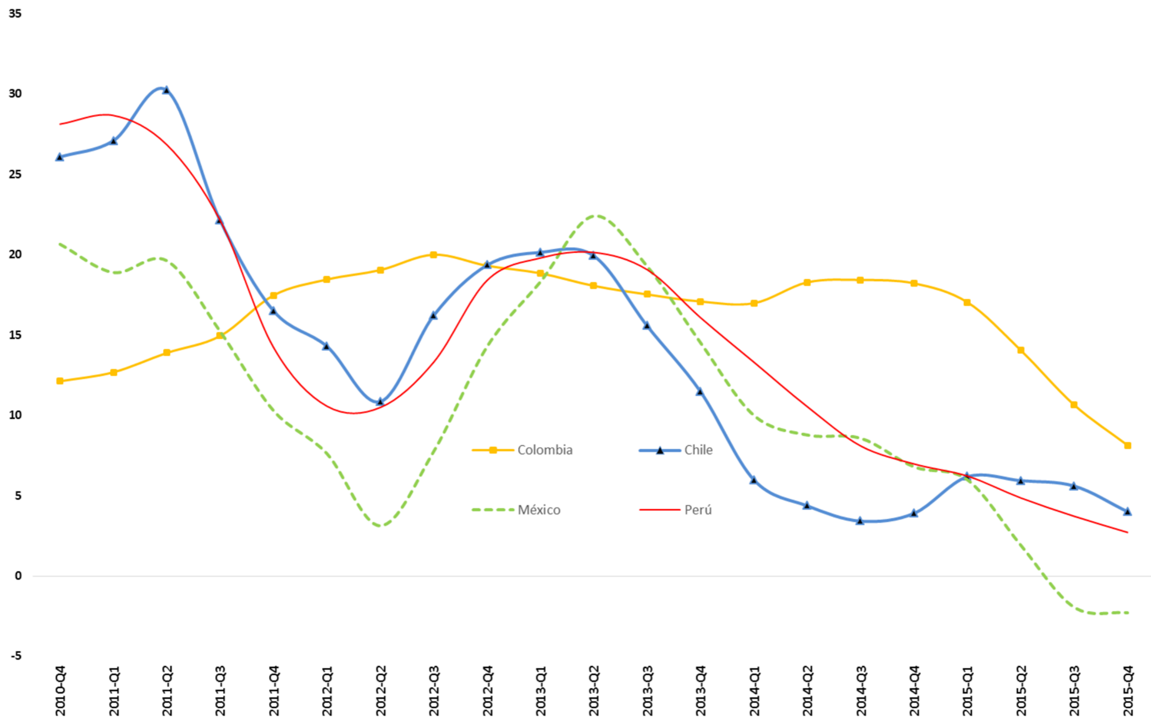
Figure 2: Share of non-traditional exports of Pacific Alliance member economies (% of total exports)



Source: UN Comtrade.

As it has already been mentioned, the members of the Pacific Alliance are part of the MILA, which can explain the similarities that occur within the dynamics of the flows of capital that can be observed, as these countries now share a common financial market. Therefore, these economies, apart of their important real linkages, also show share common trends regarding their financial cycles. For example, in Figure 3 it can be seen that Chile, Mexico and Peru have great similarities in the evolution of their portfolio and direct investment, while Colombia shows a lesser correlation with the bloc.

Figure 3: Portfolio and foreign direct investment capital inflows to Pacific Alliance member economies
(4-quarter cumulative % var.)



Source: International Monetary Fund.

3. Literature review

The model used in this paper is based on the Global Projection Model (GPM) of the International Monetary Fund (IMF). The GPM was first developed by Carabenciov et al. (2008a), where they propose and estimate the model for the United States economy, using Bayesian techniques and adding financial-real linkages into the economic structure. Afterwards, the authors develop additional models to study multi-country interactions (Euro Area and Japan) and the impact of oil prices (Carabenciov et al. 2008b, 2008c). Over the course of the next years, the authors added more economies to the model, such as Latin America and China (Canales Kriljenko et al. 2009, Carabenciov et al. 2013, Blagrave et al. 2013). We follow their framework in order to model the 4 member economies of the Pacific Alliance, as well as those of China and the United States, which are the 2 most important economies in the world, as well as the main trade partners of the bloc.

There has not been much discussion in the economic literature regarding the Pacific Alliance, but there has been other works related to whether trade blocs are convenient or not. For example, recently, there has been much discussion about the convenience of the Trans-Pacific Partnership (TPP). Petri and Plummer (2016) use a Computable General Equilibrium Model (CGE) with 19 sectors and 29 regions, which includes interactions between firms, households, and government to study the economic effects of the TPP. They find that, by 2030, this agreement, should it had come into force, would have produced a benefit of approximately US$ 465 billions of additional income for the TPP members. This increase on income the authors predict is based on the economic integration reforms and the labor creation the TPP agreement would have brought. This finding seems to be supported by other research such as Lee and Itakura (2014) or Strutt et al. (2015).

On the discussion whether Central Banks should coordinate their policies, Kahn and Meade (2016) maintain the idea that most of the Central Bank interactions up to now in history can be basically defined as diplomacy, which is how the authors call the basic relationship building between institutions. The authors then point out there have not been much situations in which Central Banks have taken joint actions. Finally, they aim for a global Central Bank coordination scheme in times of crisis, which could be useful in times of crisis. In this same line, Mohan and Kapur (2014) also discuss about how conventional and non-conventional monetary policy have gone uncoordinated between Central Banks until now, even though, given globalization and global spillovers, it could be desirable to do so.

Perhaps, the best example of a monetary policy coordination scheme is the Economic and Monetary Union (EMU) of the European Union (EU), which has been extensively analyzed. For example, Beetsma et al. (2001) survey a series of issues regarding macroeconomic policy and coordination within the EMU. Their main objective is to answer the question if coordination is desirable, and their main finding is that it is beneficial when the correlation of the shocks (demand or supply) is low between countries. The authors use a macroeconomic model which characterizes demand, supply, budget deficit, nominal interest rate, inflation and expected inflation within the EMU. Through a series of symmetric and asymmetric supply and demand shocks, the authors evaluate the welfare loss function to obtain their main results. They find that the desirability of policy coordination depends on the shock.

We can also find the works of Suardi (2001) which explains how the transmission channels work when there is a single monetary policy across the economies of the EU, obtaining that there is a certain degree of convergence that could reduce asymmetries in some areas of the EU. Mortensen (2013) and Leino and Saarenheimo (2016) deepen the discussion on the coordination of macroeconomic policies for the EMU, regarding topics like limits in the use of power of the EU over the member states, comparison between policy coordination and policy competition and a brief outline of the most remarkable events that the EU has gone through.

4. Model

The model we follow is based on the Global Projection Model (GPM) of the International Monetary Fund (IMF), which provides a simple multi-country semi-structural framework[3]. In order to capture the transmission channels of the spillovers of global shocks to the Pacific Alliance economies, we introduce to the model equations for terms of trade, commodities, portfolio inflows, foreign

[3] As Roldán-Peña et al. (2016) point out, models like the GPM have some limitations that arise from their simplicity. First, as they lack microfoundations, they may not be adequate for welfare analysis. Second, agent heterogeneity is not considered in these models. Third, as linearized models around the steady state, they do not capture non-linear effects within and between the modeled economies, so these models can only show what would happen under normal times and not under a large crisis (like the 2007-2008 financial crisis), making them prone to the critique that economic models do not predict crises or what could happen when going through one.

direct investment inflows, lending, lending interest rates and macroprudential policy. Therefore, we can model external shocks such an interest rate rise in the United States (which would affect the portfolio inflows) or an economic slowdown in China (which would affect the terms of trade).

While the original GPM models include the largest economies in the world and Latin America as one big country, in this paper we will first model each of the Pacific Alliance members individually, as well as China and the United States, which are the member's main trade partners outside the Pacific Alliance. This will be the case in which there is no monetary and macroprudential policy coordination between the Pacific Alliance member countries. Then, we will go on to a second case in which the Pacific Alliance is considered as one country. This will be the case for monetary and macroprudentia policy coordination among the Pacific Alliance member countries.

In order to answer the question whether it is convenient to coordinate monetary and macroprudential policies within the Pacific Alliance, we will compare the impulse-response functions and the welfare losses resulting from the spillover effects of the global shocks, on the individual economies of the bloc and on the bloc as a whole. For the comparison we propose a welfare loss function. For each Pacific Alliance member the welfare loss function will depend on the deviations from the steady state for the output, the inflation and the lending when facing a the spillovers caused by global shocks coming from China or the United States.

4.1. 6-country model

First, we describe the equations for the case in which each member country of the Pacific Alliance is modeled separated from the other.

4.1.1. Pacific Alliance member countries

Each member economy $i = [CL, CO, MX, PE]$ of the Pacific Alliance will follow the same structure.

From the original GPM, the 5 equations considered are an IS curve, a Phillips curve, a Taylor rule, the real exchange rate dynamics and the real interest rate. Also, following the GPM, all variables are stated in deviations from their respective steady states, with the exception of the interest rate and the real exchange rate, which are both expressed in levels.

IS curve

$$y_{i,t} = \beta_{i,1} y_{i,t-1} - \beta_{i,2} r_{i,t} + \beta_{i,3} Z^T_{i,t-1} + \beta_{i,4} y^X_{i,t-1} + \beta_{i,5} tot_{i,t-1} + \beta_{i,6} l_{i,t-1} + \varepsilon^y_{i,t} \quad (1)$$

Phillips curve

$$\pi_{i,t} = \lambda_{i,1} E_t \pi_{i,t+1} + \lambda_{i,2} y_{i,t-1} + \lambda_{i,3} Z^M_{i,t-1} + \varepsilon^\pi_{i,t} \quad (2)$$

Taylor rule

$$I_{i,t} = C_i^I + \gamma_{i,1}(\pi_{i,t} - \pi_i^{tar}) + \gamma_{i,2} y_{i,t} + \varepsilon_{i,t}^I \tag{3}$$

Where C_i^I is an intercept and π_i^{tar} is the inflation target.

Real exchange rate dynamics

$$Z_{i,t} = \eta_{i,1}\left[(Z_{i,t+1}) + (r_{US,t} - r_{i,t})\right] - \eta_{i,2} f k_{i,t}^{port} - \eta_{i,3} f k_{i,t}^{fdi} + \varepsilon_{i,t}^Z \tag{4}$$

Real interest rate

$$r_{i,t} = I_{i,t} - \pi_{i,t+1} \tag{5}$$

The changes in the aggregate demand from its steady state level are considered through the IS curve, which is defined as a relation between the output gap $y_{i,t}$, its lag $y_{i,t-1}$ and the real interest rate $r_{i,t}$. It models the economic activity.

Deviations of the aggregate supply from its steady state are introduced through the Phillips curve which shows the existing relation between the current inflation $\pi_{i,t}$ on one side and the expected future inflation $E_t\pi_{i,t+1}$ and the past output gap $y_{i,t-1}$ on the other side. It is the equation that shows the movements of the inflation.

The Taylor rule defines the movements of the monetary policy interest rate $I_{i,t}$, set by the Central Bank, which are responses to the inflation deviations from its target rate $(\pi_{i,t} - \pi_i^{tar})$ and the output gap $y_{i,t}$.

Also, in the open economy models, like this one, the real exchange rate $Z_{i,t}$ dynamics are modeled usually by stating that the uncovered interest parity (UIP) holds. Here, the real exchange rate considered in every case is the bilateral one, which is computed as the nominal exchange rate of the domestic currency per United States dollar controlled by the relative price of the United States consumer prices in relation to the domestic consumer prices. Also, we interpret a raise in the real exchange rate as a depreciation for the local economy goods, while a fall in the real exchange rate is interpreted as an appreciation for the local economy goods.

As a multi-country model, the GPM takes into account interactions among the considered economies. First, in the IS curve, a term for the sum of the distance of real exchange rates weighted by trade inflows $Z_{i,t-1}^T$ is introduced, to take into account that the foreign trade inflows will try to reach the country that shows the higher real exchange rate relative depreciation. Also, in the IS curve appears a term for the output gaps of the other countries weighted by export inflows $y_{i,t-1}^X$, to show how the output gap depends on the foreign demand. Finally, in the Phillips curve appears a term for an import-weighted sum of the distance of real exchange rate $Z^M_{i,t-1}$, to consider the imported inflation.

In our model, the additions to the GPM structure are equations for the terms of trade $tot_{i,t}$, commodity prices $pcom_{i,t}$, portfolio inflows $fk^{port}_{i,t}$, foreign direct investment inflows $fk^{fdi}_{i,t}$, lending $l_{i,t}$, lending interest rates $I^l_{i,t}$ and macroprudential policy rate $mp_{i,t}$. As before, all variables are stated in deviation from their steady states, with the lending interest rates and macroprudential policy rates being the exception, as they are expressed in levels.

The first extension to the GPM model involves the terms of trade $tot_{i,t}$ and the prices of the commodities $pcom_{i,t}$ that each member country export. The commodity prices depend on the demand that comes from China, measured by the China output gap $y_{CN,t}$, and have their impact on the terms of trade.

Then, the terms of trade appear on the IS curve equation, with a positive sign, as a way of pointing out that higher export prices will increase the economic activity of each country.

Terms of trade gap

$$tot_{i,t} = \theta_{i,1} tot_{i,t-1} + \theta_{i,2} pcom_{i,t} + \varepsilon^{tot}_{i,t} \tag{6}$$

Commodity price gap

$$pcom_{i,t} = \theta_{i,3} pcom_{i,t-1} + \theta_{i,4} y_{CN,t} + \varepsilon^{pcom}_{i,t} \tag{7}$$

The next extensions to the GPM model are equations for the portfolio capital inflows gap $fk^{port}_{i,t}$ and the foreign direct investment capital inflows gap $fk^{fdi}_{i,t}$. The first equation models how the portfolio inflows to each country respond to the differential of each country real interest rate and the United States interest rate $(r_{i,t} - r_{US,t})$, as well as the past output gap $y_{i,t-1}$. Therefore, the portfolio inflows increase when the local real interest rates promise higher returns than in the United States and when the local economies are going through favorable times. As these inflows may revert in the very short term, there is no lag included in the equation.

The second equation shows the dynamics of the foreign direct investment capital inflows gap as a function of its recent past $fk^{fdi}_{i,t-1}$ (as these are investments of longer terms that the portfolio capital inflows) and an average of the whole Pacific Alliance output gap lag $y^{PA}_{i,t-1}$ (as we consider that foreign investors see the Pacific Alliance as a whole).

Both types of inflows appear, first, on the real exchange rate dynamics with a negative sign. This way of modeling shows how the real exchange rate appreciates when there are foreign inflows to the countries. Then, both inflows enter on the lending gap with a positive sign, considering the fact that banks will absorb part of the inflows and thus will increase their lending.

Portfolio capital inflows gap

$$fk_{i,t}^{port} = \tau_{i,1}(r_{i,t} - r_{US,t}) + \tau_{i,2}y_{i,t-1} + \varepsilon_{i,t}^{fk^{port}} \tag{8}$$

Foreign direct investment capital inflows gap

$$fk_{i,t}^{fdi} = \tau_{i,3}fk_{i,t-1}^{fdi} + \tau_{i,4}y_{i,t-1}^{PA} + \varepsilon_{i,t}^{fk^{fdi}} \tag{9}$$

The last extensions to the GPM are the equations for the lending gap $l_{i,t}$, the lending interest rate $I_{i,t}^{l}$ and the macroprudential policy rate $mp_{i,t}$. The first equation shows the current lending gap $l_{i,t}$ as a result of its recent past $l_{i,t-1}$, the portfolio capital inflows $fk_{i,t}^{port}$ and foreign direct investment capital inflows $fk_{i,t}^{fdi}$, the past output gap $y_{i,t-1}$, the lending interest rate $I_{i,t}^{l}$ and the macroprudential policy rate $mp_{i,t}$. Therefore, the local lending gap will increase when there are more capital inflows to the country, as well as when the economy grows faster. On the other hand, the lending gap will reduce when its price, the lending interest rate, rises and when the macroprudential policy rate rises as well.

The lending interest rate $I_{i,t}^{l}$ depends on its lag $I_{i,t-1}^{l}$, on the current monetary policy interest rate $I_{i,t}$ set by the Central Bank and the past output gap $y_{i,t-1}$. So, this rate will rise when the Central Bank rises the monetary policy interest rate, to show that there is an effect of the monetary policy on lending, and also when the economy is not doing well, to show that banks will charge more for its lending to account for the higher risk related to adverse economic circumstances.

Finally, the macroprudential policy rate $mp_{i,t}$, which in the model is understood as the capital-to-risk weighted assets ratio, is used to curb the excess growth of the lending and output. Thus, it will rise when the lags of the gaps of lending $l_{i,t-1}$ and output $y_{i,t-1}$ increase.

Lending gap

$$l_{i,t} = \delta_{i,1}l_{i,t-1} + \delta_{i,2}fk_{i,t}^{port} + \delta_{i,3}fk_{i,t}^{fdi} + \delta_{i,4}y_{i,t-1} - \delta_{i,5}I_{i,t}^{l} - \delta_{i,6}mp_{i,t} + \varepsilon_{i,t}^{l} \tag{10}$$

Lending interest rate

$$I_{i,t}^{l} = \mu_{i,1}I_{i,t-1}^{l} + \mu_{i,2}I_{i,t} - \mu_{i,3}y_{i,t-1} + \varepsilon_{i,t}^{I^{l}} \tag{11}$$

Macroprudential policy rate

$$mp_{i,t} = \xi_{i,1} l_{i,t-1} + \xi_{i,2} y_{i,t-1} + \varepsilon_{i,t}^{mp} \tag{12}$$

Also, the following auxiliary equations are used:

Total trade-weighted partner real exchange rate distance index

$$Z_{i,t}^{T} = \sum_{j \neq i} \omega_{i,j}^{T} \left(Z_{i,t} - Z_{j,t} \right) \tag{13}$$

Where j applies for all the 6 countries considered and $\omega_{i,j}^{T}$ is the 2011-2015 average of the sum of the imports and exports between country i and country j expressed as a percentage of the GDP of country i .

Export-weighted partner output gaps index

$$y_{i,t}^{X} = \sum_{j \neq i} \omega_{i,j}^{X} y_{j,t} \tag{14}$$

Where j applies for all the 6 countries considered and $\omega_{i,j}^{X}$ is the 2011-2015 average of exports from country i to country j expressed as a percentage of the GDP of country i .

Import-weighted partner real exchange rate distance index

$$Z_{i,t}^{M} = \sum_{j \neq i} \omega_{i,j}^{M} \left(Z_{i,t} - Z_{j,t} \right) \tag{15}$$

Where j applies for all the 6 countries considered and $\omega_{i,j}^{M}$ is the 2011-2015 average of imports of country i that come from country j expressed as a percentage of the GDP of country i .

Pacific Alliance average output gap

$$y_{t}^{PA} = \sum_{i} \omega_{i}^{PA} y_{i,t} \tag{16}$$

Where i applies for the Pacific Alliance member economies and ω_{i}^{PA} is the weights given to each country within this Pacific Alliance index. In this 6-country version of the model, each member country will have equal weights.

4.1.2. China

In our model, the Chinese economy is considered through the original GPM equations: the IS curve, the Phillips curve, the Taylor rule, the real exchange dynamics and the real interest rate.

The first modification for China will be on the real exchange rate $Z_{CN,t}$ dynamics, where no capital inflows will be considered. Instead, as a way of modeling the fact that the Chinese government has shown some control over its exchange rate in order to stabilize its economy, lagged terms for the inflation rate differential from its target $(\pi_{CN,t-1} - \pi^{tar}_{CN})$ and the output gap $y_{CN,t-1}$ are introduced as determinants of the real exchange rate. The real exchange rate is calculated in relation to the United States.

IS curve

$$y_{CN,t} = \beta_{CN,1} y_{CN,t-1} - \beta_{CN,2} r_{CN,t} + \beta_{CN,3} Z^{T}_{CN,t-1} + \beta_{CN,4} y^{X}_{CN,t-1} - \beta_{CN,7} RR_{CN,t} + \varepsilon^{y}_{CN,t} \quad (17)$$

Phillips curve

$$\pi_{CN,t} = \lambda_{CN,1} E_t \pi_{CN,t+1} + \lambda_{CN,2} y_{CN,t-1} + \lambda_{CN,3} Z^{M}_{CN,t-1} + \varepsilon^{\pi}_{CN,t} \quad (18)$$

Taylor rule

$$I_{CN,t} = C^{I}_{CN} + \gamma_{CN,1}(\pi_{CN,t} - \pi^{tar}_{CN}) + \gamma_{CN,2} y_{CN,t} + \varepsilon^{I}_{CN,t} \quad (19)$$

Where C^{I}_{CN} is an intercept.

Real exchange rate dynamics

$$Z_{CN,t} = C^{Z}_{CN} + \eta_{CN,1}\left[(Z_{CN,t+1}) + (r_{US,t} - r_{CN,t})\right] + \phi_{CN,1}(\pi_{CN,t-1} - \pi^{tar}_{CN}) - \phi_{CN,2} y_{CN,t-1} + \varepsilon^{Z}_{CN,t} \quad (20)$$

Where C^{Z}_{CN} is an intercept.

Real interest rate

$$r_{CN,t} = I_{CN,t} - \pi_{CN,t+1} \tag{21}$$

The second modification is the addition of a reserve requirements ratio $RR_{CN,t}$ as a second monetary policy tool for China. This ratio is modeled following a Taylor rule and affects the economic activity directly through the IS curve.

Reserve requirements ratio

$$RR_{CN,t} = C_{CN}^{RR} + \kappa_{CN,1}(\pi_{CN,t-1} - \pi_{CN}^{tar}) + \kappa_{CN,2} y_{CN,t} + \varepsilon_{CN,t}^{RR} \tag{22}$$

Where C_{CN}^{RR} is an intercept.

No equations are added for lending and for capital inflows, as they are not relevant for the current analysis and also because there is little reliable data on these variables.

The following are the auxiliary equations for China:

Total trade-weighted partner real exchange rate distance index

$$Z_{CN,t}^{T} = \sum_{j \neq CN} \omega_{CN,j}^{T} \left(Z_{CN,t} - Z_{j,t}\right) \tag{23}$$

Where j applies for all of the other 5 countries considered in the model and $\omega_{CN,j}^{T}$ is the 2011-2015 average of the sum of the imports and exports between China and country j expressed as a percentage of China GDP.

Export-weighted partner output gaps index

$$y_{CN,t}^{X} = \sum_{j \neq CN} \omega_{CN,j}^{X} y_{j,t} \tag{24}$$

Where j applies for all of the other 5 countries considered in the model and $\omega_{CN,j}^{X}$ is the 2011-2015 average of exports from China to country j expressed as a percentage of China GDP.

Import-weighted partner real exchange rate distance index

$$Z_{CN,t}^{M} = \sum_{j \neq CN} \omega_{CN,j}^{M} \left(Z_{CN,t} - Z_{j,t} \right) \tag{25}$$

Where j applies for all of the other 5 countries considered in the model and $\omega_{CN,j}^{M}$ is the 2011-2015 average of imports of China that come from country j expressed as a percentage of China GDP.

4.1.3. United States

The United States economy has a main block conformed by the IS curve, the Phillips curve, the Taylor rule and the real interest rate. No real exchange dynamics equation is considered, because the rest of the countries' real exchange rates are calculated in relation to the United States currency. Due to the fact the United States has a relatively closed economy, no terms from the other countries are considered in the IS curve or the Phillips curve.

IS curve

$$y_{US,t} = \beta_{US,1} y_{US,t-1} - \beta_{US,2} r_{US,t} + \beta_{US,5} tot_{US,t-1} + \beta_{US,6} l_{US,t-1} + \varepsilon_{US,t}^{y} \tag{26}$$

Phillips curve

$$\pi_{US,t} = \lambda_{US,1} E_t \pi_{US,t+1} + \lambda_{US,2} y_{US,t-1} + \varepsilon_{US,t}^{\pi} \tag{27}$$

Taylor rule

$$I_{US,t} = C_{US}^{I} + \gamma_{US,1}(\pi_{US,t} - \pi_{US}^{tar}) + \gamma_{US,2} y_{US,t} + \varepsilon_{US,t}^{I} \tag{28}$$

Real interest rate

$$r_{US,t} = I_{US,t} - \pi_{US,t+1} \tag{29}$$

The extensions for the United States include, in first place, the terms of trade gap and the commodity prices gap, to allow for an impact of China commodity demand on the United States output gap, this also being the only impact a foreign country has over the United States economy. Also considered are the lending gap and lending interest rate equations, so as to permit a credit crunch shock in our model.

Terms of trade gap

$$tot_{US,t} = \theta_{US,1} tot_{US,t-1} + \theta_{US,2} pcom_{US,t} + \varepsilon^{tot}_{US,t} \tag{30}$$

Commodity price gap

$$pcom_{US,t} = \theta_{US,3} pcom_{US,t-1} + \theta_{i,4} y_{CN,t-1} + \varepsilon^{pcom}_{US,t} \tag{31}$$

Lending gap

$$l_{US,t} = \delta_{US,1} l_{US,t-1} + \delta_{US,4} y_{US,t-1} - \delta_{US,5} I^{l}_{US,t} + \varepsilon^{l}_{US,t} \tag{32}$$

Lending interest rate

$$I^{l}_{US,t} = \mu_{US,1} I^{l}_{US,t-1} + \mu_{US,2} I_{US,t} - \mu_{US,3} y_{US,t-1} + \varepsilon^{I^{l}}_{US,t} \tag{33}$$

4.2. 3-country model

In this second case, we consider the whole Pacific Alliance bloc as one country, while the China and United States economies remain the same as in the previous case. In order to obtain a Pacific Alliance bloc country in the model, we follow the same equations used individually for each of the Pacific Alliance member countries in the previous case, but considering aggregate variables. Each of these Pacific Alliance bloc variables is a GDP-weighted average obtained from the corresponding variable of each member country.

4.3. Shocks

All the shocks considered in the model are assumed to be $AR(1)$ processes. Therefore, each shock can be expressed by the following equation:

$$\varepsilon_{i,t} = \rho_{\varepsilon} \varepsilon_{i,t-1} + \upsilon_{\varepsilon,t}$$

Where $\upsilon_{\varepsilon,t} \sim N(0, \sigma^2)$.

Even though in the model we consider shocks in each equation, only 6 global shocks will be analyzed. On the one hand, for China we consider a negative demand shock, a reserve requirement ratio raise shock and a renminbi depreciation shock. On the other hand, for the United States we take into account a negative demand shock, a contractionary monetary policy shock and a credit crunch shock. The shocks were chosen because of their recent relevance.

First, the recent Chinese economic slowdown can be captured as a negative demand shock. Second, the preferred monetary policy tool of the People's Bank of China in recent times has been the reserve requirements ratio, so a reserve requirements ratio raise shock is more relevant to analyze than the monetary policy interest rate raise one. Third, in recent times there has been records of currency devaluation in China, making a renminbi depreciation shock also relevant to study.

Fourth, the United States economy is the largest one in the world and, as such, an economic slowdown is bound to affect the Pacific Alliance member economies, making it relevant to analyze a negative demand shock in this country. Fifth, following the recuperation of the United States economy after a decade of weak growth, and associated to the Federal Reserve's monetary policy normalization process, raises in the United States monetary policy interest rate have finally happened and these raises have had repercussions worldwide, thus making a United States monetary policy raise shock relevant for analysis. Sixth, during the financial crisis of the last decade, many banks decided to reduce their lending, in what became known as a credit crunch, which played its part in bolstering the recession. We will also consider a credit crunch shock to study how a financial shock in the United States has ramifications to the Pacific Alliance member economies.

Before the shocks occur, the variables are assumed to be on their steady state. As the model is expressed in deviations from the steady state, the initial values of all variables will be 0.

Each of the shocks will happen in period 0 and will have a standard deviation of size equal to 1. We will then study the model economic implications for the following 60 quarters after the shock.

Finally, as it can be seen, all the shocks are set to have contractionary effects over the Pacific Alliance bloc.

4.4. Welfare loss function

The way of analyzing whether conventional or non-conventional monetary policy coordination is convenient or not among the member countries of the Pacific Alliance when facing the spillovers coming from the global shocks is based on the definition of a welfare loss function $L_{i,t}$.

$$L_{i,t} = y_{i,t}^2 + \pi_{i,t}^2 + l_{i,t}^2$$

The welfare loss function was specified this way so as to include the main real indicator variable of the model (output gap), an indicator of how families and firm are affected by the conventional and non-conventional monetary policies (inflation) and a financial indicator (lending gap).

Then, in order to obtain a single number representing the welfare losses in which the economies incur for the 60 analyzed quarters for each economy, we will calculate the sum discounted values of the welfare losses $\hat{L}_i$, using the monetary policy interest rate as the discount rate.

$$\hat{L}_i = \sum_{t=1}^{60} \frac{L_{i,t}}{(1 + I_{i,t})^t}$$

5. Data

For the estimation of the parameters of the model, we consider quarterly data, which goes from 2011Q1 to 2015Q4. The variables and their related observable series are shown in Table 1.

Table 1: Variables

Variable	Description	Observable series	Source
$y_{i,t}$	Output gap	Real GDP index	IMF
$\pi_{i,t}$	Inflation rate	CPI annual percent change	IMF
$I_{i,t}$	Monetary policy interest rate	Monetary policy interest rate	IMF
$Z_{i,t}$	Real exchange rate	Bilateral real exchange rate (measured against the US)	Bloomberg, IMF
$tot_{i,t}$	Terms of trade gap	Terms of trade	Bloomberg
$pcom_{i,t}$	Commodity price gap	Main commodity exports price index	Bloomberg, IMF, WTO
$l_{i,t}$	Lending gap	Credit to the private non-financial sector	BIS, Central Banks
$I^l_{i,t}$	Lending interest rate	Lending interest rate	IMF
$fk^{port}_{i,t}$	Portfolio capital inflows gap	Portfolio investment liabilities	IMF
$fk^{fdi}_{i,t}$	Foreign direct investment capital inflows gap	Direct investment liabilities	IMF
$mp_{i,t}$	Macroprudential policy rate	Capital-to-risk weighted assets ratio	IMF
$RR_{CN,t}$	Reserve requirements ratio	Reserve requirements ratio	Bloomberg

The variables in gaps are expressed in percentage deviations from their respective steady states. All the series used for obtaining the gap variables were first seasonally adjusted and filtered. In addition, the lending, portfolio capital inflows and foreign direct investment inflows series were deflated beforehand, as they were originally expressed in current dollars. On the other hand, the variables expressed as rates and the real exchange rate did not receive any transformation.

In the case in which the Pacific Alliance as a whole is considered as one country we first use a GDP-weighted average for each series, before transforming them into gaps or entering them into the model as rates. The GDP weights represent the average size each member country economy of the Pacific Alliance had into the bloc between 2011 and 2015 expressed in real terms. The corresponding weights are 13% for Chile, 17% for Colombia, 60% for Mexico and 10% for Peru.

6. Results

For answering the question of whether it is convenient for the Pacific Alliance member countries to coordinate their conventional and non-conventional policies, we compare the resulting impulse-response functions and the welfare losses generated by the spillover effects of global shocks in each of the cases considered for the model.

First, each case is estimated with Bayesian methods. The parameter estimation results of each case are shown in the appendix. With the estimated parameters, we proceed to simulate each case when the external shocks occur.

6.1. China negative demand shock

When a negative demand shock occurs in China, the output gap falls for all the Pacific Alliance member economies, as their exports and terms of trade fall. This also has a negative effect on both inflation and lending. As the economies become less attractive for foreign investors, the portfolio capital flows gap and the foreign direct investment flows gap fall. Because there is less foreign currency in the Pacific Alliance member economies, due to falling exports and capital flows, the real exchange rate rises, in what can be understood as a real exchange rate depreciation. The response of Pacific Alliance member economies is to lower both its monetary policy interest rate and its macroprudential policy rate, in order to try to curb the contraction. The lowering of the monetary policy interest rate further reduces the portfolio capital flows gap.

As it can be seen on Figure 4, on average, when considering the Pacific Alliance as a bloc, both the size and the duration of the responses of the variables to the shock are reduced in comparison to the individual country responses. This is corroborated when seeing the results of the welfare losses caused by the shock in Table 2. Therefore, the existence of the Pacific Alliance itself already acts as a shock buffer upon the considered shock.

Figure 4: Impulse-response functions to China negative demand shock

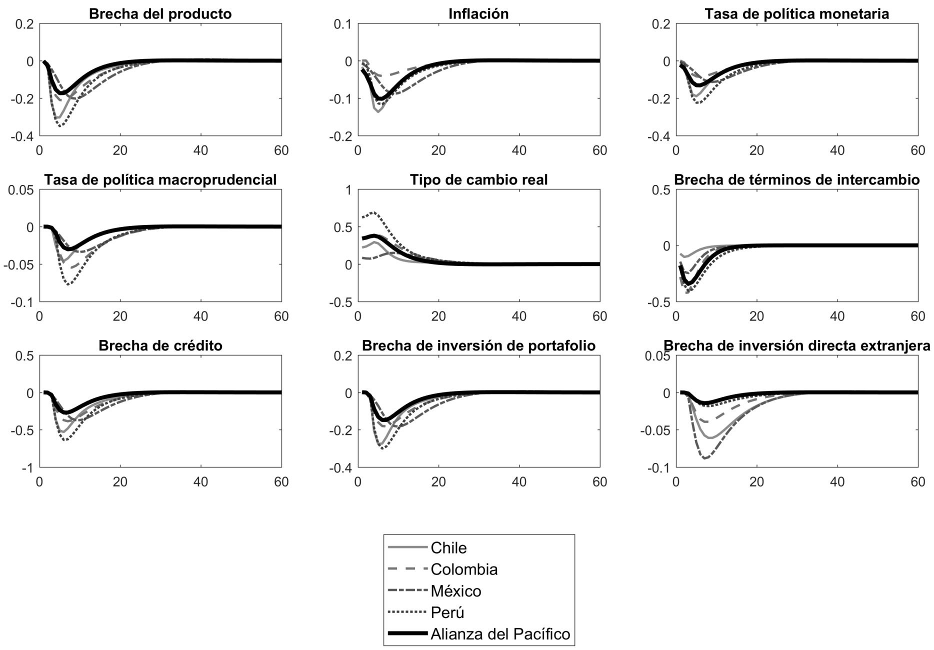


Table 2: Welfare losses to China negative demand shock

	6-country model	3-country model
Chile	27.03	NA
Colombia	25.37	NA
Mexico	103.23	NA
Peru	30.28	NA
Pacific Alliance	**185.90**	**72.94**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

6.2. China reserve requirements ratio raise shock

According to the model, a raise of the Chinese reserve requirements ratio impacts directly on the Chinese economic activity, causing, therefore, responses on the Pacific Alliance member economies similar in direction to those caused by the China negative demand shock, although with lower impacts. The difference here, as seen on Figure 5, is the persistence of the shock. The estimation of the parameters shows a very persistent Chinese reserve requirements ratio raise shock, which is a result of slow and persistent changes on the observable Chinese reserve requirements ratio series, and which can also be seen as an indicator of the soft-landing policy of the Chinese economy.

When comparing the cases of no coordination and coordination of monetary and macroprudential policies within the member countries of the Pacific Alliance, once more the size and the duration of the responses are lower in the latter than in the former (Figure 5). This means the overall welfare losses in the latter case are also lower than in the former case (Table 3).

Figure 5: Impulse-response functions to China reserve requirements ratio raise shock

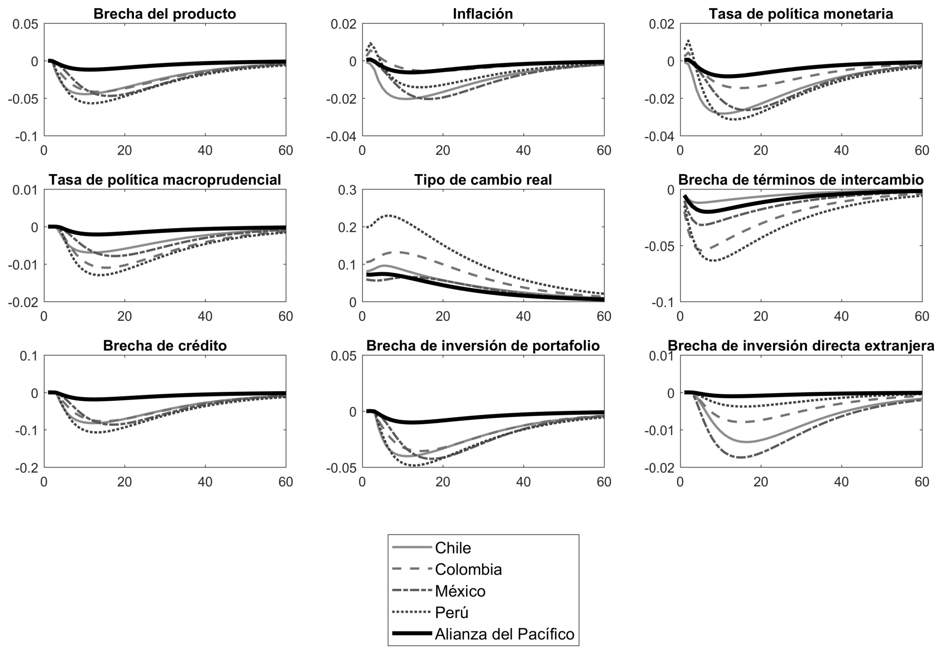


Table 3: Welfare losses to China reserve requirements ratio raise shock

	6-country model	3-country model
Chile	2.51	NA
Colombia	2.81	NA
Mexico	12.55	NA
Peru	2.77	NA
Pacific Alliance	**20.64**	**1.00**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

6.3. China renminbi depreciation shock

In Figure 6 it can be seen that a Chinese currency depreciation shock, expressed in the model as a raise in the Chinese real exchange rate[4], is persistently contractionary for Chile, Colombia and Peru, because a portion of the total exports of these countries are substitutes with Chinese exports, and as Chinese goods become relatively cheaper for the rest of the countries, exports from these 3 Pacific Alliance member economies fall. The case of Mexico is different, as there is not much substitution with its exports and those from China. In inflationary terms, these shock

[4]We are assuming currency depreciation is related to real exchange rate depreciation.

reduces the price level in all the 4 countries considered, because of the falling imported inflation component from China. Monetary policy and macroprudential policy respond accordingly to the fall in output by reducing policy rates. On all the cases, the terms of trade increase as export prices for local goods raise in relation to those coming from China. Finally, the portfolio capital inflows fall for the main 3 affected countries, following the fall in economic activity, and the foreign direct investment capital inflows fall for the 4 countries, as in the model we consider that this variable depends always on the output gap of the whole Pacific Alliance bloc, whether it be the case of no coordination or the case of coordination.

This shock also depreciates the Chilean and Peruvian real exchange rate, while the effect on the Colombian and Mexican real exchange rate is minimal. The effect for Chile and Peru happens because of the real interest rate differential with the United States, as well as for the fall in the portfolio and foreign direct investment capital inflows gaps, which make foreign currency scarcer.

When the cases of economic reactions of the individual countries and the reactions of the whole Pacific Alliance as a bloc are compared, we obtain similar results to the previously analyzed shocks. The size of the response and its duration fall significantly when the Pacific Alliance member economies coordinate their actions. This means a reduced volatility and lower overall welfare losses, as expressed on Table 4.

Figure 6: Impulse-response functions to China depreciation shock

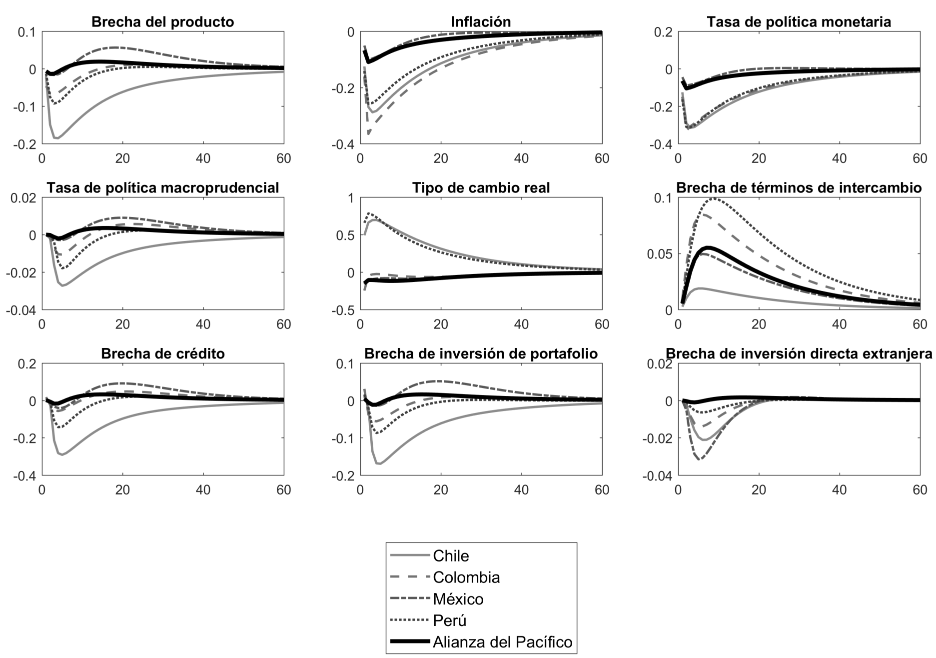


Table 4: Welfare losses to China renminbi depreciation shock

	6-country model	3-country model
Chile	27.75	NA
Colombia	23.31	NA
Mexico	17.75	NA
Peru	7.65	NA
Pacific Alliance	**76.46**	**12.18**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

6.4. United States negative demand shock

Upon a negative demand shock coming from the United States, it can be seen on Figure 7 that the most affected country, as expected, is Mexico, due to their strong economic procyclicality and trade partnership with the United States (approximately 74% of Mexican exports go to the United States and 50% of Mexican imports come from the United States). Also, it can be seen that the output gap of all the Pacific Alliance member economies respond negatively, due to falling exports to the United States. This triggers a falling inflation rate and a reduction of the monetary policy interest rate and the macroprudential policy rate. The falling demand of the United States also manages to affect negatively the terms of trade (indirectly via an also falling China output gap). Due to the falling output in the Pacific Alliance, also the lending gap and the portfolio and foreign direct investment inflows gaps fall. Regarding the real exchange rate, the shock is initially appreciatory for the individual economies, because of the fall in the portfolio and foreign direct investment inflows gaps. In the case of the 3-country model, all the variables of the Pacific Alliance respond with lower volatility but in the same direction as do the variables of its member economies in the 6-country model, except for the real exchange rate. For the case of policy coordination, the shock is depreciatory. This has to do with the lower fall in the foreign direct investment inflows gap, as well as in the real interest rate differential with the United States.

Finally, Table 5 shows the results for the welfare loss functions. Once more, the case for the 3-country model results in a lower overall welfare loss for the Pacific Alliance.

Figure 7: Impulse-response functions to United States negative demand shock

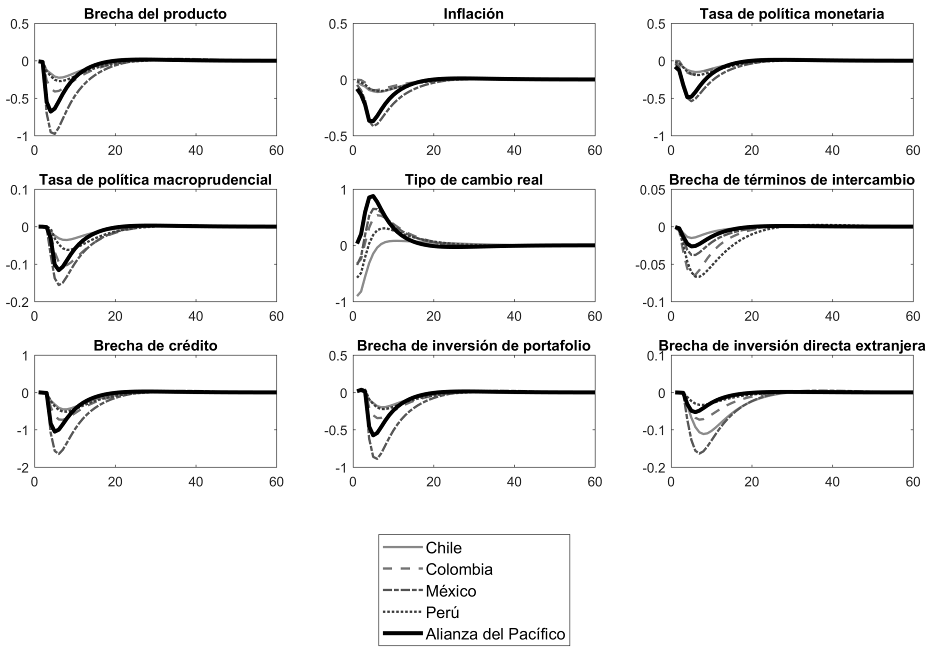


Table 5: Welfare losses to United States negative demand shock

	6-country model	3-country model
Chile	25.89	NA
Colombia	82.46	NA
Mexico	1312.26	NA
Peru	24.11	NA
Pacific Alliance	**1444.72**	**763.59**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

6.5. United States interest rate raise shock

The raise of the monetary policy interest rate in the United States has a direct impact on the United States output gap and lending gap. Thus, this shocks shares characteristics with the negative demand shock in the United States though less intense and less persistent, as shown in Figure 8. Nonetheless, this shock has a depreciatory effect over the real exchange rates of all the individual countries of the Pacific Alliance and of the bloc as a whole. This happens because of the real interest rate differential with the United States, in which the United States always has a higher real interest rate than the other countries, for which foreign currency becomes scarcer in the Pacific Alliance member countries, causing an overall real exchange rate depreciation.

Table 6 shows the comparison of the welfare losses for the 6-country and the 3-country models. As it happened with the previously analyzed shocks, considering the Pacific Alliance as a bloc reduces the variable response size and duration. This means a lower overall welfare loss in the second case.

Figure 8: Impulse-response functions to United States interest rate raise shock

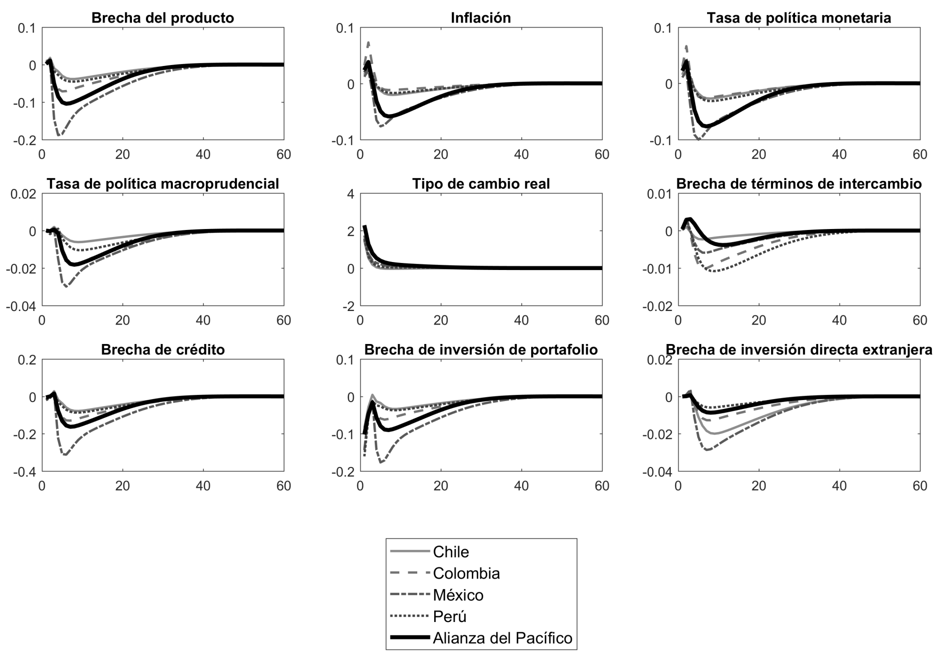


Table 6: Welfare losses to United States interest rate raise shock

	6-country model	3-country model
Chile	1.25	NA
Colombia	4.15	NA
Mexico	66.25	NA
Peru	1.15	NA
Pacific Alliance	**72.80**	**42.51**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

6.6. United States credit crunch shock

This shock in the financial markets in the United States also has effects over the model variables similar to those of the United States negative demand shock, although with a lower impact size. The response of the individual economies of the Pacific Alliance reflects their individual financial system resilience to international financial shocks. This is shown in Figure 9. Nevertheless, what calls the attention is the response of the Pacific Alliance variables when considered as a bloc. These responses are shown to be more volatile that those of most of the Pacific Alliance member economies, following closely those of Mexico. Therefore, Table 7 shows that upon this specific shock, the overall welfare losses for the Pacific Alliance are lower in the no coordination case.

Figure 9: Impulse-response functions to United States credit crunch shock

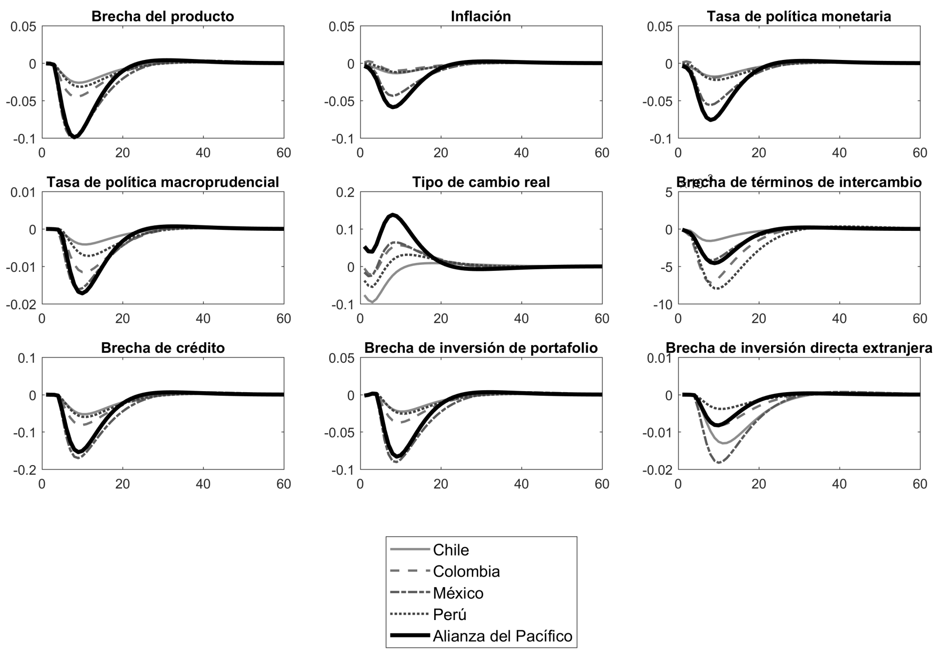


Table 7: Welfare losses functions to United States credit crunch shock

	6-country model	3-country model
Chile	0.43	NA
Colombia	1.30	NA
Mexico	19.41	NA
Peru	0.40	NA
Pacific Alliance	**21.54**	**26.28**

Note: The values corresponding to the 6-country model appear multiplied by their respective weights.

7. Conclusions

While the Pacific Alliance has managed to achieve trade and financial integration and has had success overcoming the spillovers caused by global shocks that have generated outside the bloc, no piece of research has tried to answer the question whether the Pacific Alliance would be better off if its member economies coordinated their monetary and macroprudential policies.

For answering this question, we proposed a modified version of the Global Projection Model (GPM) of the International Monetary Fund (IMF), in which we added equations for terms of trade, commodities, portfolio inflows, foreign direct investment inflows, lending, lending interest rates and macroprudential policy. We first estimated a 6-country model considering the 4 member economies of the Pacific Alliance (Chile, Colombia, Mexico and Peru), as well as their main partners and 2 most important economies in the world (China and the United States). By having each Pacific Alliance member economy respond individually from the other, we defined this as the no monetary and macroprudential policy coordination case. Then we estimated a 3-country model considering the Pacific Alliance as a bloc, China and the United States. By taking into account the alignment of the actions of the Pacific Alliance member economies, we defined this as the monetary and macroprudential policy coordination case.

With the results of the estimations we simulated how both cases respond to the spillover effects of 6 global shocks: a negative demand shock, a reserve requirement ratio raise shock and a renminbi depreciation shock coming from China, and a negative demand shock, a contractionary monetary policy shock and a credit crunch shock coming from the United States. Through the analysis of the impulse-response functions and welfare loss functions we found that in 5 out of 6 shocks, the Pacific Alliance member economies are better off in the policy coordination case.

The results show that when the Pacific Alliance member economies coordinate their actions, the size and duration of the responses to the shocks are reduced significantly. Thus, the Pacific Alliance trade bloc would act as a shock buffer through its trade and financial linkages, as well as through the possibly coordinated actions among its member economies.

Yet, there is an agenda for further research. For example, no conclusions have been reached regarding whether there should exist or not a mechanism to enforce policy coordination so that the member countries act as one when facing an external shock. Therefore, there are several issues to be discussed about before a policy recommendation can be made.

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9. Appendix

Table 8: Commodity price indices

Country	Commodity price index	Source
Chile	Copper price index	IMF
Colombia	Brent crude price index	IMF
Mexico	US manufacture import index	WTO
Peru	Gold price index	Bloomberg
United States	US manufacture export index	WTO

Table 9: Trade weights for 6-country model

Weights	Value	Weights	Value	Weights	Value	Weights	Value	Weights	Value
$\omega^T_{CL,CO}$	0.010	$\omega^T_{CO,CL}$	0.007	$\omega^T_{MX,CL}$	0.003	$\omega^T_{PE,CL}$	0.015	$\omega^T_{CN,CL}$	0.004
$\omega^T_{CL,MX}$	0.015	$\omega^T_{CO,MX}$	0.018	$\omega^T_{MX,CO}$	0.005	$\omega^T_{PE,CO}$	0.013	$\omega^T_{CN,CO}$	0.001
$\omega^T_{CL,PE}$	0.014	$\omega^T_{CO,PE}$	0.007	$\omega^T_{MX,PE}$	0.002	$\omega^T_{PE,MX}$	0.012	$\omega^T_{CN,MX}$	0.004
$\omega^T_{CL,CN}$	0.127	$\omega^T_{CO,CN}$	0.039	$\omega^T_{MX,CN}$	0.055	$\omega^T_{PE,CN}$	0.080	$\omega^T_{CN,PE}$	0.002
$\omega^T_{CL,US}$	0.094	$\omega^T_{CO,US}$	0.094	$\omega^T_{MX,US}$	0.398	$\omega^T_{PE,US}$	0.076	$\omega^T_{CN,US}$	0.055
$\omega^M_{CL,CO}$	0.022	$\omega^M_{CO,CL}$	0.015	$\omega^M_{MX,CL}$	0.004	$\omega^M_{PE,CL}$	0.032	$\omega^M_{CN,CL}$	0.011
$\omega^M_{CL,MX}$	0.033	$\omega^M_{CO,MX}$	0.093	$\omega^M_{MX,CO}$	0.002	$\omega^M_{PE,CO}$	0.035	$\omega^M_{CN,CO}$	0.002
$\omega^M_{CL,PE}$	0.023	$\omega^M_{CO,PE}$	0.017	$\omega^M_{MX,PE}$	0.002	$\omega^M_{PE,MX}$	0.042	$\omega^M_{CN,MX}$	0.005
$\omega^M_{CL,CN}$	0.198	$\omega^M_{CO,CN}$	0.172	$\omega^M_{MX,CN}$	0.161	$\omega^M_{PE,CN}$	0.197	$\omega^M_{CN,PE}$	0.005
$\omega^M_{CL,US}$	0.204	$\omega^M_{CO,US}$	0.269	$\omega^M_{MX,US}$	0.491	$\omega^M_{PE,US}$	0.201	$\omega^M_{CN,US}$	0.079
$\omega^X_{CL,CO}$	0.012	$\omega^X_{CO,CL}$	0.028	$\omega^X_{MX,CL}$	0.006	$\omega^X_{PE,CL}$	0.039	$\omega^X_{CN,CL}$	0.006
$\omega^X_{CL,MX}$	0.019	$\omega^X_{CO,MX}$	0.017	$\omega^X_{MX,CO}$	0.013	$\omega^X_{PE,CO}$	0.024	$\omega^X_{CN,CO}$	0.003
$\omega^X_{CL,PE}$	0.025	$\omega^X_{CO,PE}$	0.025	$\omega^X_{MX,PE}$	0.004	$\omega^X_{PE,MX}$	0.013	$\omega^X_{CN,MX}$	0.014
$\omega^X_{CL,CN}$	0.244	$\omega^X_{CO,CN}$	0.069	$\omega^X_{MX,CN}$	0.015	$\omega^X_{PE,CN}$	0.179	$\omega^X_{CN,PE}$	0.003
$\omega^X_{CL,US}$	0.123	$\omega^X_{CO,US}$	0.324	$\omega^X_{MX,US}$	0.793	$\omega^X_{PE,US}$	0.155	$\omega^X_{CN,US}$	0.172

Source: UN Comtrade.

Table 10: Trade weights for 3-country model

Weights	Value	Weights	Value
$\omega^T_{PA,CN}$	0.057	$\omega^T_{CN,PA}$	0.008
$\omega^T_{PA,US}$	0.258	$\omega^T_{CN,US}$	0.042
$\omega^M_{PA,CN}$	0.153	$\omega^M_{CN,PA}$	0.016
$\omega^M_{PA,US}$	0.384	$\omega^M_{CN,US}$	0.052
$\omega^X_{PA,CN}$	0.059	$\omega^X_{CN,PA}$	0.016
$\omega^X_{PA,US}$	0.579	$\omega^X_{CN,US}$	0.123

Source: UN Comtrade.

Table 11: Intercepts for 6-country model

Intercept	Value
C^{I}_{CL}	2.93
C^{I}_{CO}	2.58
C^{I}_{MX}	2.55
C^{I}_{PE}	2.25
C^{I}_{CN}	3.19
C^{RR}_{CN}	0.48
C^{Z}_{CN}	0.61
C^{I}_{US}	1.75

Note: Intercepts values were chosen in order to have residuals equal to zero in all the equations while simulating the model.

Table 12: Intercepts for 3-country model

Intercept	Value
C^{I}_{PA}	2.80
C^{I}_{CN}	3.21
C^{RR}_{CN}	0.50
C^{Z}_{CN}	0.34
C^{I}_{US}	1.81

Note: Intercepts values were chosen in order to have residuals equal to zero in all the equations while simulating the model.

Table 13: Inflation targets

Country	Target
Chile	3.00
Colombia	3.00
Mexico	3.00
Peru	2.00
China	4.00
United States	2.00
Pacific Alliance (mode)	3.00

Source: Central Banks.

Table 14: Estimation results for the 6-country model (Chile)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{CL,1}$	0.54	0.46	beta	0.05
$\beta_{CL,2}$	0.20	0.14	beta	0.05
$\beta_{CL,3}$	0.15	0.14	beta	0.05
$\beta_{CL,4}$	0.89	0.88	beta	0.05
$\beta_{CL,5}$	0.10	0.04	beta	0.05
$\beta_{CL,6}$	0.05	0.06	beta	0.01
$\lambda_{CL,1}$	0.59	0.46	beta	0.05
$\lambda_{CL,2}$	0.23	0.28	beta	0.05
$\lambda_{CL,3}$	0.16	0.09	beta	0.05
$\gamma_{CL,1}$	0.91	0.98	gamma	0.05
$\gamma_{CL,2}$	0.20	0.19	gamma	0.05
$\eta_{CL,1}$	0.90	0.96	beta	0.05
$\eta_{CL,2}$	0.10	0.10	beta	0.05
$\eta_{CL,3}$	0.10	0.02	beta	0.05
$\theta_{CL,1}$	0.10	0.03	beta	0.05
$\theta_{CL,2}$	0.10	0.08	beta	0.05
$\theta_{CL,3}$	0.50	0.43	gamma	0.05
$\theta_{CL,4}$	1.10	1.01	gamma	0.05
$\tau_{CL,1}$	0.10	0.08	beta	0.05
$\tau_{CL,2}$	0.90	0.90	beta	0.05
$\tau_{CL,3}$	0.50	0.63	beta	0.05
$\tau_{CL,4}$	0.10	0.11	beta	0.05
$\delta_{CL,1}$	0.10	0.04	beta	0.05
$\delta_{CL,2}$	0.10	0.04	beta	0.05
$\delta_{CL,3}$	0.75	0.80	beta	0.05
$\delta_{CL,4}$	1.50	1.52	gamma	0.05
$\delta_{CL,5}$	0.10	0.09	beta	0.05
$\delta_{CL,6}$	0.25	0.13	beta	0.05
$\mu_{CL,1}$	0.50	0.49	beta	0.05
$\mu_{CL,2}$	0.75	0.72	beta	0.05
$\mu_{CL,3}$	0.50	0.50	beta	0.05
$\xi_{CL,1}$	0.10	0.03	beta	0.05
$\xi_{CL,2}$	0.10	0.11	beta	0.05

Table 15: Estimation results for the 6-country model (Colombia)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{CO,1}$	0.54	0.51	beta	0.05
$\beta_{CO,2}$	0.20	0.21	beta	0.05
$\beta_{CO,3}$	0.15	0.11	beta	0.05
$\beta_{CO,4}$	0.89	0.82	beta	0.05
$\beta_{CO,5}$	0.10	0.15	beta	0.05
$\beta_{CO,6}$	0.05	0.04	beta	0.01
$\lambda_{CO,1}$	0.59	0.44	beta	0.05
$\lambda_{CO,2}$	0.23	0.22	beta	0.05
$\lambda_{CO,3}$	0.16	0.13	beta	0.05
$\gamma_{CO,1}$	0.91	0.86	gamma	0.05
$\gamma_{CO,2}$	0.20	0.24	gamma	0.05
$\eta_{CO,1}$	0.90	0.93	beta	0.05
$\eta_{CO,2}$	0.10	0.24	beta	0.05
$\eta_{CO,3}$	0.10	0.07	beta	0.05
$\theta_{CO,1}$	0.10	0.06	beta	0.05
$\theta_{CO,2}$	0.10	0.28	beta	0.05
$\theta_{CO,3}$	0.50	0.52	gamma	0.05
$\theta_{CO,4}$	1.10	1.02	gamma	0.05
$\tau_{CO,1}$	0.10	0.14	beta	0.05
$\tau_{CO,2}$	0.90	0.85	beta	0.05
$\tau_{CO,3}$	0.50	0.44	beta	0.05
$\tau_{CO,4}$	0.10	0.10	beta	0.05
$\delta_{CO,1}$	0.10	0.14	beta	0.05
$\delta_{CO,2}$	0.10	0.01	beta	0.05
$\delta_{CO,3}$	0.75	0.49	beta	0.05
$\delta_{CO,4}$	1.50	1.46	gamma	0.05
$\delta_{CO,5}$	0.10	0.14	beta	0.05
$\delta_{CO,6}$	0.25	0.17	beta	0.05
$\mu_{CO,1}$	0.50	0.51	beta	0.05
$\mu_{CO,2}$	0.75	0.80	beta	0.05
$\mu_{CO,3}$	0.50	0.51	beta	0.05
$\xi_{CO,1}$	0.10	0.10	beta	0.05
$\xi_{CO,2}$	0.10	0.08	beta	0.05

Table 16: Estimation results for the 6-country model (Mexico)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{MX,1}$	0.54	0.45	beta	0.05
$\beta_{MX,2}$	0.20	0.16	beta	0.05
$\beta_{MX,3}$	0.15	0.02	beta	0.05
$\beta_{MX,4}$	0.89	0.87	beta	0.05
$\beta_{MX,5}$	0.10	0.09	beta	0.05
$\beta_{MX,6}$	0.05	0.04	beta	0.01
$\lambda_{MX,1}$	0.59	0.50	beta	0.05
$\lambda_{MX,2}$	0.23	0.24	beta	0.05
$\lambda_{MX,3}$	0.16	0.03	beta	0.05
$\gamma_{MX,1}$	0.91	0.85	gamma	0.05
$\gamma_{MX,2}$	0.20	0.19	gamma	0.05
$\eta_{MX,1}$	0.90	0.99	beta	0.05
$\eta_{MX,2}$	0.10	0.03	beta	0.05
$\eta_{MX,3}$	0.10	0.06	beta	0.05
$\theta_{MX,1}$	0.10	0.23	beta	0.05
$\theta_{MX,2}$	0.10	0.14	beta	0.05
$\theta_{MX,3}$	0.50	0.48	gamma	0.05
$\theta_{MX,4}$	1.10	1.06	gamma	0.05
$\tau_{MX,1}$	0.10	0.14	beta	0.05
$\tau_{MX,2}$	0.90	0.91	beta	0.05
$\tau_{MX,3}$	0.50	0.37	beta	0.05
$\tau_{MX,4}$	0.10	0.23	beta	0.05
$\delta_{MX,1}$	0.10	0.06	beta	0.05
$\delta_{MX,2}$	0.10	0.10	beta	0.05
$\delta_{MX,3}$	0.75	0.64	beta	0.05
$\delta_{MX,4}$	1.50	1.41	gamma	0.05
$\delta_{MX,5}$	0.10	0.04	beta	0.05
$\delta_{MX,6}$	0.25	0.12	beta	0.05
$\mu_{MX,1}$	0.50	0.47	beta	0.05
$\mu_{MX,2}$	0.75	0.80	beta	0.05
$\mu_{MX,3}$	0.50	0.52	beta	0.05
$\xi_{MX,1}$	0.10	0.03	beta	0.05
$\xi_{MX,2}$	0.10	0.11	beta	0.05

Table 17: Estimation results for the 6-country model (Peru)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{PE,1}$	0.54	0.55	beta	0.05
$\beta_{PE,2}$	0.20	0.14	beta	0.05
$\beta_{PE,3}$	0.15	0.14	beta	0.05
$\beta_{PE,4}$	0.89	0.90	beta	0.05
$\beta_{PE,5}$	0.10	0.16	beta	0.05
$\beta_{PE,6}$	0.05	0.04	beta	0.01
$\lambda_{PE,1}$	0.59	0.55	beta	0.05
$\lambda_{PE,2}$	0.23	0.23	beta	0.05
$\lambda_{PE,3}$	0.16	0.08	beta	0.05
$\gamma_{PE,1}$	0.91	1.13	gamma	0.05
$\gamma_{PE,2}$	0.20	0.27	gamma	0.05
$\eta_{PE,1}$	0.90	0.96	beta	0.05
$\eta_{PE,2}$	0.10	0.07	beta	0.05
$\eta_{PE,3}$	0.10	0.11	beta	0.05
$\theta_{PE,1}$	0.10	0.07	beta	0.05
$\theta_{PE,2}$	0.10	0.19	beta	0.05
$\theta_{PE,3}$	0.50	0.73	gamma	0.05
$\theta_{PE,4}$	1.10	1.13	gamma	0.05
$\tau_{PE,1}$	0.10	0.16	beta	0.05
$\tau_{PE,2}$	0.90	0.82	beta	0.05
$\tau_{PE,3}$	0.50	0.52	beta	0.05
$\tau_{PE,4}$	0.10	0.04	beta	0.05
$\delta_{PE,1}$	0.10	0.11	beta	0.05
$\delta_{PE,2}$	0.10	0.12	beta	0.05
$\delta_{PE,3}$	0.75	0.86	beta	0.05
$\delta_{PE,4}$	1.50	1.54	gamma	0.05
$\delta_{PE,5}$	0.10	0.05	beta	0.05
$\delta_{PE,6}$	0.25	0.22	beta	0.05
$\mu_{PE,1}$	0.50	0.70	beta	0.05
$\mu_{PE,2}$	0.75	0.73	beta	0.05
$\mu_{PE,3}$	0.50	0.51	beta	0.05
$\xi_{PE,1}$	0.10	0.10	beta	0.05
$\xi_{PE,2}$	0.10	0.04	beta	0.05

Table 18: Estimation results for the 6-country model (China)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{CN,1}$	0.47	0.40	beta	0.05
$\beta_{CN,2}$	0.20	0.23	beta	0.05
$\beta_{CN,3}$	0.17	0.20	beta	0.05
$\beta_{CN,4}$	0.50	0.52	beta	0.05
$\beta_{CN,7}$	0.10	0.07	beta	0.05
$\lambda_{CN,1}$	0.72	0.63	beta	0.05
$\lambda_{CN,2}$	0.20	0.19	beta	0.05
$\lambda_{CN,3}$	0.25	0.13	beta	0.05
$\gamma_{CN,1}$	0.80	0.80	gamma	0.05
$\gamma_{CN,2}$	0.30	0.22	gamma	0.05
$\eta_{CN,1}$	0.75	0.92	beta	0.05
$\phi_{CN,1}$	0.10	0.15	beta	0.05
$\phi_{CN,2}$	0.10	0.15	beta	0.05
$\kappa_{CN,1}$	0.10	0.12	gamma	0.05
$\kappa_{CN,2}$	0.10	0.22	gamma	0.05

Table 19: Estimation results for the 6-country model (United States)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{US,1}$	0.57	0.43	beta	0.05
$\beta_{US,2}$	0.19	0.23	beta	0.05
$\beta_{US,5}$	0.25	0.25	beta	0.05
$\beta_{US,6}$	0.05	0.05	beta	0.01
$\lambda_{US,1}$	0.75	0.74	beta	0.05
$\lambda_{US,2}$	0.18	0.20	beta	0.05
$\gamma_{US,1}$	0.91	0.88	gamma	0.05
$\gamma_{US,2}$	0.21	0.29	gamma	0.05
$\theta_{US,1}$	0.30	0.28	beta	0.05
$\theta_{US,2}$	0.10	0.15	beta	0.05
$\theta_{US,3}$	0.75	0.77	gamma	0.05
$\theta_{US,4}$	0.75	0.83	gamma	0.05
$\delta_{US,1}$	0.75	0.75	beta	0.05
$\delta_{US,4}$	1.25	1.41	gamma	0.05
$\delta_{US,5}$	0.10	0.10	beta	0.05
$\mu_{US,1}$	0.95	0.92	beta	0.05
$\mu_{US,2}$	0.90	0.91	beta	0.05
$\mu_{US,3}$	0.25	0.22	beta	0.05

Table 20: Estimation results for the 6-country model (Shocks)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.	Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\rho_{\varepsilon^{y}_{CL,t}}$	0.50	0.64	beta	0.10	$\rho_{\varepsilon^{l}_{MX,t}}$	0.50	0.73	beta	0.10
$\rho_{\varepsilon^{\pi}_{CL,t}}$	0.50	0.55	beta	0.10	$\rho_{\varepsilon^{Il}_{MX,t}}$	0.50	0.33	beta	0.10
$\rho_{\varepsilon^{I}_{CL,t}}$	0.50	0.78	beta	0.10	$\rho_{\varepsilon^{fkport}_{MX,t}}$	0.50	0.43	beta	0.10
$\rho_{\varepsilon^{Z}_{CL,t}}$	0.50	0.95	beta	0.10	$\rho_{\varepsilon^{fkfdi}_{MX,t}}$	0.50	0.18	beta	0.10
$\rho_{\varepsilon^{tot}_{CL,t}}$	0.50	0.26	beta	0.10	$\rho_{\varepsilon^{mp}_{MX,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{pcom}_{CL,t}}$	0.50	0.35	beta	0.10	$\rho_{\varepsilon^{y}_{PE,t}}$	0.50	0.54	beta	0.10
$\rho_{\varepsilon^{l}_{CL,t}}$	0.50	0.63	beta	0.10	$\rho_{\varepsilon^{\pi}_{PE,t}}$	0.50	0.57	beta	0.10
$\rho_{\varepsilon^{Il}_{CL,t}}$	0.50	0.63	beta	0.10	$\rho_{\varepsilon^{I}_{PE,t}}$	0.50	0.74	beta	0.10
$\rho_{\varepsilon^{fkport}_{CL,t}}$	0.50	0.43	beta	0.10	$\rho_{\varepsilon^{Z}_{PE,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{fkfdi}_{CL,t}}$	0.50	0.36	beta	0.10	$\rho_{\varepsilon^{tot}_{PE,t}}$	0.50	0.54	beta	0.10
$\rho_{\varepsilon^{mp}_{CL,t}}$	0.50	0.95	beta	0.10	$\rho_{\varepsilon^{pcom}_{PE,t}}$	0.50	0.14	beta	0.10
$\rho_{\varepsilon^{y}_{CO,t}}$	0.50	0.63	beta	0.10	$\rho_{\varepsilon^{l}_{PE,t}}$	0.50	0.89	beta	0.10
$\rho_{\varepsilon^{\pi}_{CO,t}}$	0.50	0.79	beta	0.10	$\rho_{\varepsilon^{Il}_{PE,t}}$	0.50	0.68	beta	0.10
$\rho_{\varepsilon^{I}_{CO,t}}$	0.50	0.81	beta	0.10	$\rho_{\varepsilon^{fkport}_{PE,t}}$	0.50	0.63	beta	0.10
$\rho_{\varepsilon^{Z}_{CO,t}}$	0.50	0.95	beta	0.10	$\rho_{\varepsilon^{fkfdi}_{PE,t}}$	0.50	0.56	beta	0.10
$\rho_{\varepsilon^{tot}_{CO,t}}$	0.50	0.42	beta	0.10	$\rho_{\varepsilon^{mp}_{PE,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{pcom}_{CO,t}}$	0.50	0.49	beta	0.10	$\rho_{\varepsilon^{y}_{CN,t}}$	0.50	0.58	beta	0.10
$\rho_{\varepsilon^{l}_{CO,t}}$	0.50	0.86	beta	0.10	$\rho_{\varepsilon^{\pi}_{CN,t}}$	0.50	0.40	beta	0.10
$\rho_{\varepsilon^{Il}_{CO,t}}$	0.50	0.79	beta	0.10	$\rho_{\varepsilon^{I}_{CN,t}}$	0.50	0.85	beta	0.10
$\rho_{\varepsilon^{fkport}_{CO,t}}$	0.50	0.78	beta	0.10	$\rho_{\varepsilon^{RR}_{CN,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{fkfdi}_{CO,t}}$	0.50	0.50	beta	0.10	$\rho_{\varepsilon^{Z}_{CN,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{mp}_{CO,t}}$	0.50	0.95	beta	0.10	$\rho_{\varepsilon^{y}_{US,t}}$	0.50	0.59	beta	0.10
$\rho_{\varepsilon^{y}_{MX,t}}$	0.50	0.43	beta	0.10	$\rho_{\varepsilon^{\pi}_{US,t}}$	0.50	0.50	beta	0.10
$\rho_{\varepsilon^{\pi}_{MX,t}}$	0.50	0.43	beta	0.10	$\rho_{\varepsilon^{I}_{US,t}}$	0.50	0.46	beta	0.10
$\rho_{\varepsilon^{I}_{MX,t}}$	0.50	0.66	beta	0.10	$\rho_{\varepsilon^{tot}_{US,t}}$	0.50	0.52	beta	0.10
$\rho_{\varepsilon^{Z}_{MX,t}}$	0.50	0.63	beta	0.10	$\rho_{\varepsilon^{pcom}_{US,t}}$	0.50	0.60	beta	0.10
$\rho_{\varepsilon^{tot}_{MX,t}}$	0.50	0.50	beta	0.10	$\rho_{\varepsilon^{l}_{US,t}}$	0.50	0.43	beta	0.10
$\rho_{\varepsilon^{pcom}_{MX,t}}$	0.50	0.63	beta	0.10	$\rho_{\varepsilon^{Il}_{US,t}}$	0.50	0.24	beta	0.10

Table 21: Estimation results for the 3-country model (Pacific Alliance)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{PA,1}$	0.54	0.53	beta	0.05
$\beta_{PA,2}$	0.20	0.15	beta	0.05
$\beta_{PA,3}$	0.15	0.02	beta	0.05
$\beta_{PA,4}$	0.89	0.94	beta	0.05
$\beta_{PA,5}$	0.10	0.12	beta	0.05
$\beta_{PA,6}$	0.05	0.05	beta	0.01
$\lambda_{PA,1}$	0.59	0.62	beta	0.05
$\lambda_{PA,2}$	0.23	0.28	beta	0.05
$\lambda_{PA,3}$	0.16	0.04	beta	0.05
$\gamma_{PA,1}$	0.91	0.93	gamma	0.05
$\gamma_{PA,2}$	0.20	0.21	gamma	0.05
$\eta_{PA,1}$	0.90	1.00	beta	0.05
$\eta_{PA,2}$	0.10	0.09	beta	0.05
$\eta_{PA,3}$	0.10	0.11	beta	0.05
$\theta_{PA,1}$	0.10	0.03	beta	0.05
$\theta_{PA,2}$	0.10	0.15	beta	0.05
$\theta_{PA,3}$	0.50	0.65	gamma	0.05
$\theta_{PA,4}$	1.10	1.20	gamma	0.05
$\tau_{PA,1}$	0.10	0.10	beta	0.05
$\tau_{PA,2}$	0.90	0.84	beta	0.05
$\tau_{PA,3}$	0.50	0.34	beta	0.05
$\tau_{PA,4}$	0.10	0.06	beta	0.05
$\delta_{PA,1}$	0.10	0.03	beta	0.05
$\delta_{PA,2}$	0.10	0.05	beta	0.05
$\delta_{PA,3}$	0.75	0.60	beta	0.05
$\delta_{PA,4}$	1.50	1.47	gamma	0.05
$\delta_{PA,5}$	0.10	0.03	beta	0.05
$\delta_{PA,6}$	0.25	0.18	beta	0.05
$\mu_{PA,1}$	0.50	0.53	beta	0.05
$\mu_{PA,2}$	0.75	0.78	beta	0.05
$\mu_{PA,3}$	0.50	0.57	beta	0.05
$\xi_{PA,1}$	0.10	0.08	beta	0.05
$\xi_{PA,2}$	0.10	0.05	beta	0.05

Table 22: Estimation results for the 3-country model (China)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{CN,1}$	0.47	0.46	beta	0.05
$\beta_{CN,2}$	0.20	0.19	beta	0.05
$\beta_{CN,3}$	0.17	0.23	beta	0.05
$\beta_{CN,4}$	0.50	0.47	beta	0.05
$\beta_{CN,7}$	0.10	0.03	beta	0.05
$\lambda_{CN,1}$	0.72	0.66	beta	0.05
$\lambda_{CN,2}$	0.20	0.17	beta	0.05
$\lambda_{CN,3}$	0.25	0.24	beta	0.05
$\gamma_{CN,1}$	0.80	0.80	gamma	0.05
$\gamma_{CN,2}$	0.30	0.30	gamma	0.05
$\eta_{CN,1}$	0.75	0.90	beta	0.05
$\phi_{CN,1}$	0.10	0.09	beta	0.05
$\phi_{CN,2}$	0.10	0.12	beta	0.05
$\kappa_{CN,1}$	0.10	0.12	gamma	0.05
$\kappa_{CN,2}$	0.10	0.07	gamma	0.05

Table 23: Estimation results for the 3-country model (United States)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\beta_{US,1}$	0.57	0.50	beta	0.05
$\beta_{US,2}$	0.19	0.11	beta	0.05
$\beta_{US,5}$	0.25	0.33	beta	0.05
$\beta_{US,6}$	0.05	0.05	beta	0.01
$\lambda_{US,1}$	0.75	0.79	beta	0.05
$\lambda_{US,2}$	0.18	0.23	beta	0.05
$\gamma_{US,1}$	0.91	0.90	gamma	0.05
$\gamma_{US,2}$	0.21	0.27	gamma	0.05
$\theta_{US,1}$	0.30	0.23	beta	0.05
$\theta_{US,2}$	0.10	0.03	beta	0.05
$\theta_{US,3}$	0.75	0.75	gamma	0.05
$\theta_{US,4}$	0.75	0.71	gamma	0.05
$\delta_{US,1}$	0.75	0.69	beta	0.05
$\delta_{US,4}$	1.25	1.30	gamma	0.05
$\delta_{US,5}$	0.10	0.11	beta	0.05
$\mu_{US,1}$	0.95	0.90	beta	0.05
$\mu_{US,2}$	0.90	0.89	beta	0.05
$\mu_{US,3}$	0.25	0.18	beta	0.05

Table 24: Estimation results for the 3-country model (Shocks)

Parameter	Prior mean	Post. mean	Dist.	Std. dev.
$\rho_{\varepsilon^{y}_{PA,t}}$	0.50	0.49	beta	0.10
$\rho_{\varepsilon^{\pi}_{PA,t}}$	0.50	0.40	beta	0.10
$\rho_{\varepsilon^{I}_{PA,t}}$	0.50	0.79	beta	0.10
$\rho_{\varepsilon^{Z}_{PA,t}}$	0.50	0.79	beta	0.10
$\rho_{\varepsilon^{tot}_{PA,t}}$	0.50	0.59	beta	0.10
$\rho_{\varepsilon^{pcom}_{PA,t}}$	0.50	0.09	beta	0.10
$\rho_{\varepsilon^{l}_{PA,t}}$	0.50	0.72	beta	0.10
$\rho_{\varepsilon^{Il}_{PA,t}}$	0.50	0.51	beta	0.10
$\rho_{\varepsilon^{fkport}_{PA,t}}$	0.50	0.40	beta	0.10
$\rho_{\varepsilon^{fkfdi}_{PA,t}}$	0.50	0.16	beta	0.10
$\rho_{\varepsilon^{mp}_{PA,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{y}_{CN,t}}$	0.50	0.62	beta	0.10
$\rho_{\varepsilon^{\pi}_{CN,t}}$	0.50	0.61	beta	0.10
$\rho_{\varepsilon^{I}_{CN,t}}$	0.50	0.83	beta	0.10
$\rho_{\varepsilon^{RR}_{CN,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{Z}_{CN,t}}$	0.50	0.95	beta	0.10
$\rho_{\varepsilon^{y}_{US,t}}$	0.50	0.30	beta	0.10
$\rho_{\varepsilon^{\pi}_{US,t}}$	0.50	0.47	beta	0.10
$\rho_{\varepsilon^{I}_{US,t}}$	0.50	0.55	beta	0.10
$\rho_{\varepsilon^{tot}_{US,t}}$	0.50	0.36	beta	0.10
$\rho_{\varepsilon^{pcom}_{US,t}}$	0.50	0.69	beta	0.10
$\rho_{\varepsilon^{l}_{US,t}}$	0.50	0.53	beta	0.10
$\rho_{\varepsilon^{Il}_{US,t}}$	0.50	0.51	beta	0.10