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## The Macroeconomic Impact of COVID-19 in EMEs

Marco Hernandez-Vega

Banco de México

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# The Macroeconomic Impact of COVID-19 in EMEs\*

Marco Hernandez-Vega<sup>†</sup>

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**Abstract:** The COVID-19 pandemic caused severe losses in the world economy, particularly in emerging market economies (EMEs), which had to withstand the challenges of the pandemic and its domestic repercussions while also facing the deterioration of external demand. Using a panel data model, we estimate how the number of deaths and lockdown measures affected GDP growth, the unemployment rate, and export growth from January 2020 to September 2021, based on a sample of 25 countries grouped into three regions. The results indicate that lockdown measures had a negative and statistically significant impact on GDP growth across all regions, with some variation in the size of the estimated coefficients. Consequently, Latin America was the region most sensitive to these measures, followed by Asia and the Middle East.

**Keywords:** COVID-19, Economic Impact, Growth, Lockdown Policies

**JEL Classification:** C01, E01, I00

**Resumen:** La pandemia de COVID-19 causó graves pérdidas en la economía mundial, particularmente en las economías de mercados emergentes (EME), que tuvieron que resistir los desafíos de la pandemia y sus repercusiones internas, al mismo tiempo que enfrentaban el deterioro de la demanda externa. Utilizando un modelo de datos panel, estimamos cómo el número de muertes y las medidas de confinamiento afectaron el crecimiento del PIB, la tasa de desempleo y el crecimiento de las exportaciones de enero de 2020 a septiembre de 2021, sobre una muestra de 25 países agrupados en tres regiones. Los resultados indican que las medidas de confinamiento tuvieron un impacto negativo y estadísticamente significativo en el crecimiento del PIB en todas las regiones, con algunas diferencias en el tamaño de los coeficientes estimados. Así, América Latina fue la región más sensible a estas medidas, seguida de Asia y Medio Oriente.

**Palabras Clave:** COVID-19, Impacto Económico, Crecimiento, Políticas de Confinamiento

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# 1 Introduction

The COVID-19 pandemic plunged the global economy into a severe crisis in 2020. The speed at which the virus propagated with dire effects on public health drove the countries to adopt social distance measures. These actions caused severe supply and demand disruptions, leading to a dramatic fall in global output at the beginning of the pandemic, although it started a recovery in later months. For instance, the fall in labor supply distorted global supply chains, reducing the supply of some goods and services. Additionally, the loss of household income and the negative economic outlook reduced consumption and investment.

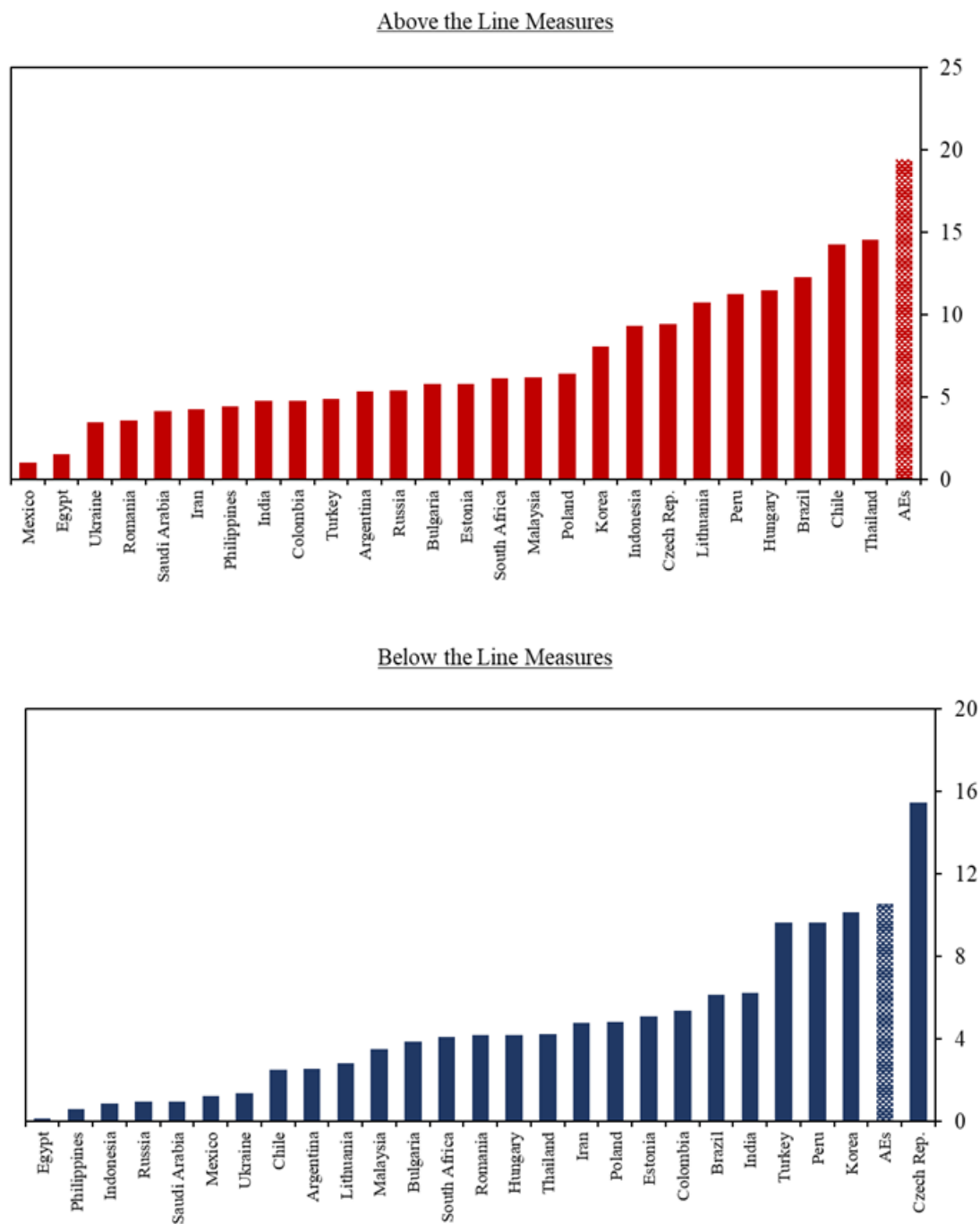
The above effects were even more significant in emerging market economies (EMEs), which had to withstand the challenges of the pandemic and its domestic repercussions while also facing the deterioration of external demand. According to Alon et al. (2021), GDP fell around 6.7 percent in EMEs, while for advanced economies, the contraction was approximately 2.4 percent on average. Specifically, their close trade relationships with advanced economies, dependence on tourism and oil demand, and exposure to capital flows retrenchments left them more vulnerable to the pandemic shock (see IMF (2020) and Hengge and ElFayoumi (2021)).

The pandemic's expected social and economic impact forced countries to design fiscal stimulus packages to support internal demand. However, financial markets' concerns about EMEs' indebtedness levels and higher financing costs led to relatively minor stimulus packages compared to those in advanced economies (Figure 1).

Given the pandemic's significant economic repercussions on the global economy, several works attempted to estimate its possible impact on the worldwide economy. Some initial works relied on general equilibrium models to simulate how spreading the virus or quarantine measures would affect the global economy. One early work is McKibbin and Fernando (2020), which used a Dynamic Stochastic General Equilibrium model (DSGE) to analyze seven possible scenarios varying from a short-lived pandemic to a more lasting one. Their simulations suggested that if the pandemic lasts for a short period, the loss in GDP could be around 2.4 trillion. In contrast, they estimated a more protracted pandemic could cost 9 trillion dollars.

Using a multi-sector general equilibrium model, Mandel and Veetil (2020) find that a 50-day lockdown could lead to a 9 percent contraction in global GDP. Çakmaklı et al. (2020) combine a general equilibrium model and an epidemiological one to study Turkey's case. Their simulations suggest restrictive containment measures have the most critical effect on GDP. In a similar approach, Acemoglu et al. (2020) find that even if the lockdown measures have a significant adverse impact on economic activity in the short term, these have significant positive effects in the medium term.

Figure 1: Fiscal Measures in Response to the COVID-19 Pandemic in Percent of GDP



*Note: AEs: Advanced Economies estimated by a weighted average by purchasing power parity of the measures implemented by Denmark, Sweden, Finland, Portugal, Norway, Switzerland, Belgium, Spain, France, The Netherlands, Italy, Germany, Canada, Japan, Australia, United Kingdom, New Zealand, and the United States. The above line measures, as classified by the IMF, include additional and accelerated spending and foregone revenue. Below-the-line measures include equity injections, loans, and guarantees but exclude asset purchases by Central Banks.*

*Source: IMF (2021).*

Other works take a more empirical approach to gauge the effect of containment measures by using high-frequency data on mobility within countries. One such work is Alexander and Karger (2020), which found that stringent containment measures drastically reduce firms' revenue. Arnon et al. (2020) used an event study analysis to estimate how mobility restrictions affect unemployment. These authors found a negative impact of such measures as well. Still, they observed that mobility had been reduced before the government announced such restrictions, suggesting the population had been ahead of policymakers.

Using data for the US, Coibion et al. (2020) conclude that containment measures are the most significant factor for rising unemployment and slowing down economic activity. Furceri and Ostry (2021) find that during the worst phase of the pandemic, developing countries suffered a more significant fall in GDP, followed by those that imposed harsher lockdown restrictions and countries where the economy depends on tourism.

Kamin and Kearns (2021) studied how the pandemic affected economic activity in 58 countries. Their results suggest that both deaths and more stringent lockdown restrictions play a significant role in the slowdown of industrial production. Furthermore, they also found that disruptions in global trade were an essential factor that reduced output, mainly in poorer countries. In turn, deaths affected more countries with higher GDP, possibly because these could impose higher containment measures while poorer countries could not afford to be so strict.

However, the above works tend to group advanced and EMEs and do not consider that the behavior of cases and deaths and the harshness of lockdown policies are different. Furthermore, such behavior also differs amongst such economies. This work aims to analyze the economic impact that the COVID-19 pandemic had on EMEs. To achieve such a goal, we use a panel data model with country-fixed effects to estimate the impact of deaths and lockdown policies on GDP growth, the unemployment rate, and the growth of exports from January 2020 to September 2021 using a sample of 25 EMEs. However, as noted by Kamin and Kearns (2021), deaths and lockdown policies could be subject to a reverse causality problem. Hence, we follow these authors and estimate a two-step procedure. Lastly, given the differences in the evolution of deaths and lockdown measures across such economies, we group them into three regions (Asia and the Middle East, emerging Europe, and Latin America) and contrast the differences, if any, in the results.

The analysis contributes to identifying possible heterogeneous effects of the pandemic between regions of emerging economies. Furthermore, by having data covering up to a year after the onset of COVID-19, it is possible to compare, at least for the unemployment rate and exports, the differences in the impacts resulting from changes in the dynamics of deaths and confinement measures.

Our initial findings using the whole sample of emerging economies but for 2020 only (the initial

year of the pandemic) are that the number of deaths per 100 thousand people and the confinement measures adopted are associated with lower GDP growth in EMEs (statistically significant coefficients of  $-0.073$  and  $-0.129$  respectively). In addition, the results suggest that the deterioration of external demand (proxied by exports of goods) also had a negative effect on economic activity. One result, however, that came out consistently across the analysis is that higher-income EMEs were more sensitive to lockdown measures.

When contrasting across regions, our estimation for the whole sample period of analysis exhibits heterogeneity (regarding the magnitude and statistical significance) in the effects of the pandemic. For instance, the estimated coefficient of lockdown policies for Latin America is  $-0.448$ , while for Asia and the Middle East, it was  $-0.204$ , and for emerging Europe,  $-0.086$ . Although negative, the coefficient for deaths per 100 thousand people did not turn out to be statistically significant for these two regions, in contrast with a negative and statistically significant coefficient of  $0.040$  for Latin America.

Contrasting our results across regions and between years, we found that in 2020, deaths per 100 thousand people had a bigger and more statistically significant positive impact on the unemployment rate in Asia and the Middle East (an estimated coefficient of  $0.677$ ), but this variable had no statistically significant impact on the unemployment rate of the other two regions. In contrast, our results for 2021 show a positive and statistically significant coefficient for the interaction between confinement measures and GDP per capita in Asia and the Middle East and Latin America, suggesting that richer EMEs were more sensitive. Surprisingly, the coefficients for lockdown measures were not statistically significant in any case.

Finally, containment measures decreased exports in all three regions in 2020, with Latin America being the most sensitive region (a coefficient of  $-0.569$ ), followed by emerging Europe, and Asia and the Middle East (with estimated coefficients  $-0.46$  and  $-0.329$ , respectively).

Although emerging economies faced unprecedented challenges during the pandemic, differences across regions highlight the importance of studying COVID-19 effects and consequences by region. This work is organized as follows: the next section briefly illustrates the evolution of the pandemic in EMEs. The third section details the data used. The fourth describes the methodology. The fifth contains the results, and the sixth section details some robustness tests. The seventh concludes.

## 2 The Pandemic in Emerging Market Economies

According to the data provided by Johns Hopkins University, Argentina, Colombia, the Czech Republic, Poland, and Turkey had exhibited the highest contagions per 100 thousand people up to the third quarter of 2021, see Figures 2a to 2c.<sup>1</sup> These Figures also show that the pandemic evolved differently across countries. For instance, in Latin America, new cases during 2020 increased rapidly between January and August, then fell for most of the second half of the year in Brazil, Chile, and Peru. Still, in Colombia and Mexico, such a reduction was short-lived. Argentina's case was somewhat different. Cases grew for ten months straight and only fell in the last two months of the year. Another difference occurs in Peru, the only country that registered two peaks in reported cases: the first in May and the second in August.

In 2021, the pandemic behaved differently in these countries. New cases in Argentina, Brazil, Chile, and Colombia increased fast between March and May. In contrast, contagions in Peru grew quite quickly between January and April but dropped drastically in the following months (Figure 2a).

In emerging Europe, new cases in Bulgaria, the Czech Republic, Estonia, Lithuania, Poland, and Turkey remained relatively low during most of 2020. Still, contagions grew significantly in the last quarter of the year (Figure 2b). In contrast, newly reported cases rose earlier in Romania and Russia. Also, Russia was the only country where two substantial spikes in cases occurred during 2020: one in May and the other in December.

By 2021, emerging European countries but Lithuania and Russia observed a significant rise in new cases during March and April, then quickly dropped in the following months. In contrast, new contagions in Russia fell steadily during most of the first half of 2021.

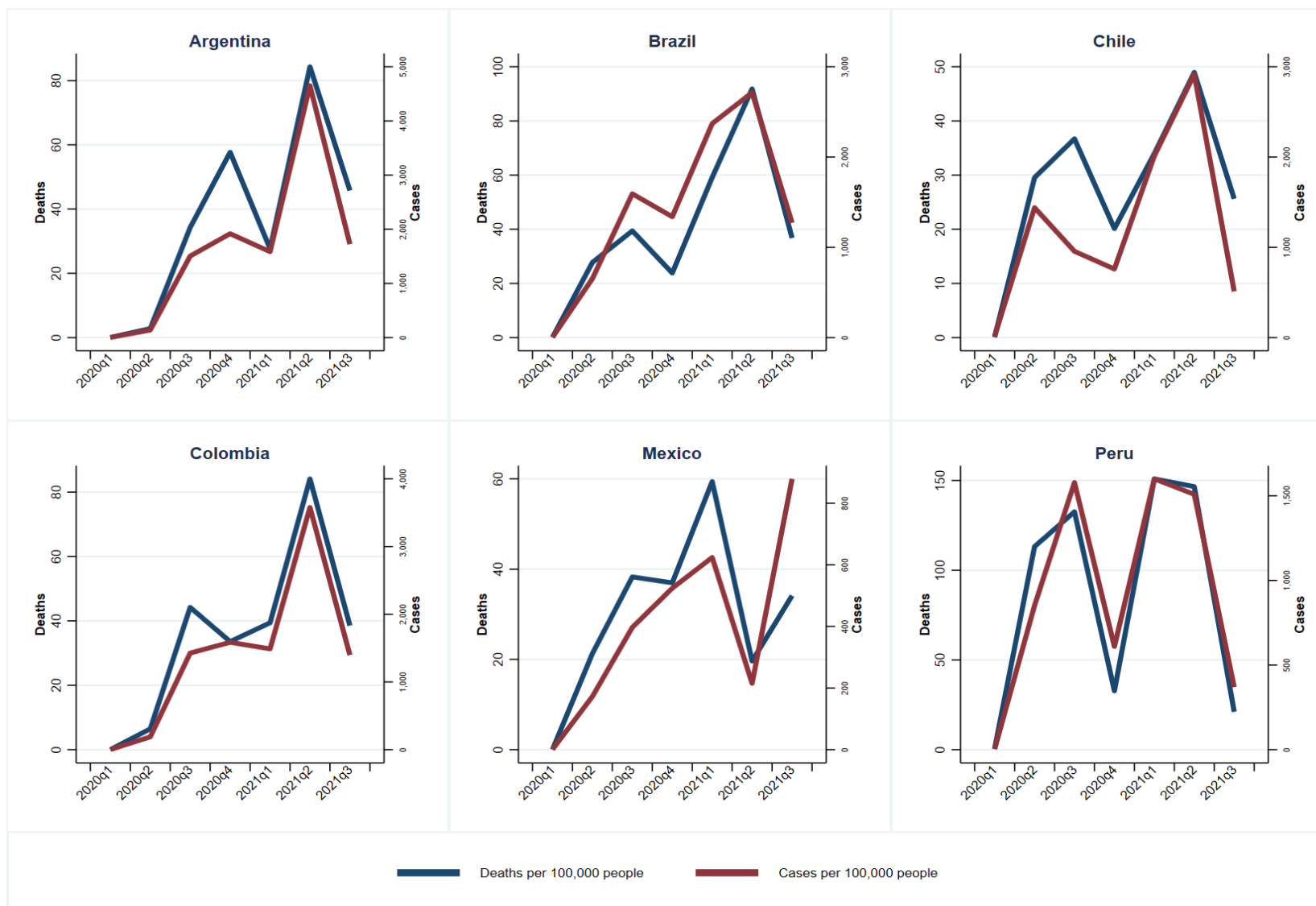
Regarding emerging Asia, the differences are more notable. By 2020, cases per 100 thousand people remained the lowest in Korea, Malaysia, and Thailand. In Indonesia, contagions were down in the first half but then accelerated in the year's second half. Lastly, India reported the highest number of COVID-19 cases per 100 thousand people in September but fell continuously for the rest of the year (Figure 2c).

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<sup>1</sup>JHU CSSE COVID-19 obtained from <https://github.com/CSSEGISandData/COVID-19>.

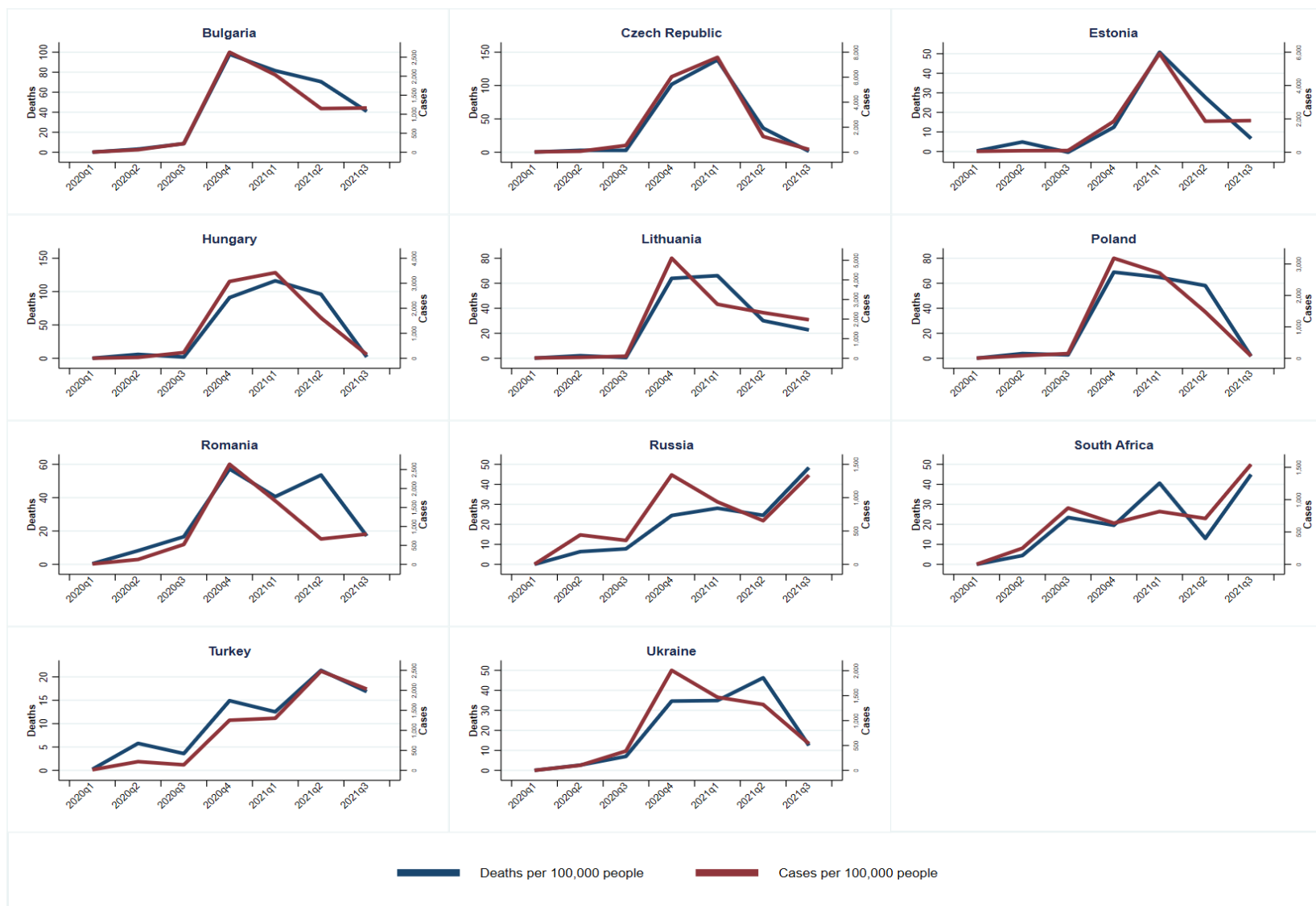


Figure 2a: COVID-19 Quarterly New Confirmed Cases and Deaths in Latin America



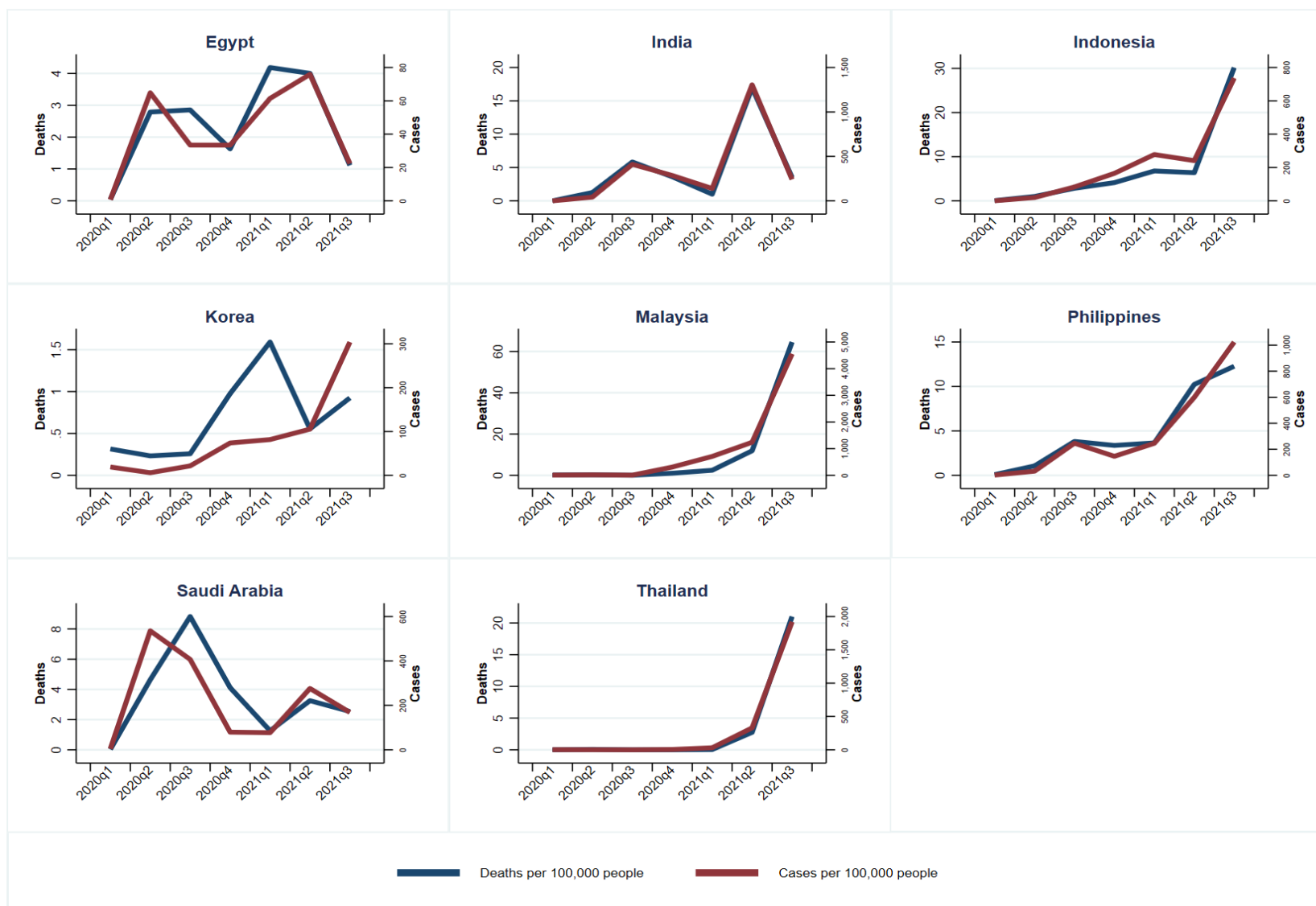
Represent the monthly accumulated number of cases and deaths per quarter  
Source: Johns Hopkins University CSSE COVID-19.

Figure 2b: COVID-19 Quarterly New Confirmed Cases and Deaths in Emerging Europe



Represent the monthly accumulated number of cases and deaths per quarter  
Source: Johns Hopkins University CSSE COVID-19.

Figure 2c: COVID-19 Quarterly New Confirmed Cases and Deaths in Emerging Asia and the Middle East



Represent the monthly accumulated number of cases and deaths per quarter  
Source: Johns Hopkins University CSSE COVID-19.

Emerging Asian countries began 2021 differently. Korea and India started the year with decreased reported cases during the first two months, while Indonesia and Malaysia saw a significant upturn of contagions in January. In turn, cases rebounded drastically in June in Korea, Malaysia, the Philippines, and Thailand, while May was India's worst month since the beginning of the pandemic.

Lastly, new cases rose rapidly during the first half of 2020 in Egypt and Saudi Arabia and continued growing in Iran for most of the year. In 2021, contagions fell significantly in Saudi Arabia, and May had the highest number of cases in Egypt.

Not surprisingly, the evolution of deaths caused by the COVID-19 virus was quite similar to the dynamics of cases in all countries, with only a few exceptional circumstances. During the second quarter of 2021, new confirmed cases in Romania and Ukraine fell while deaths grew. Furthermore, deaths in Ukraine have attained their maximum level since the beginning of the pandemic. In Romania, deaths were close to their highest number registered in the fourth quarter of 2020.

### 3 Data

To assess the impact of the pandemic on EMEs, we gather macroeconomic, COVID-19, containment measures, and fiscal support data for a sample of 25 countries.<sup>2</sup> As macroeconomic indicators, we use real GDP, the unemployment rate, exports of goods, the monetary policy rate, and 2019 GDP per capita. All variables are seasonally adjusted going from January 2020 to September 2021. As a measure of the spread of the COVID-19 virus, we select the number of new confirmed cases and deaths per 100 thousand people, and to account for the severity of the containment policies, we use Oxford's COVID-19 Government Response Tracker (OSI) designed by Hale et al. (2021). The index provides daily indicators of lockdown restrictions; the higher the index, the more challenging the policy.

Two sources regarding the fiscal support packages designed by EMEs to fight the pandemic's economic consequences exist. One comes from IMF (2021) and is the most comprehensive dataset on fiscal support across countries. The data includes measures that directly impact budget deficits (denoted as above-the-line), loans and direct investment in firms' equity (called below-the-line), and contingent liabilities. Unfortunately, there is only one observation per country. The other is the Oxford Economic Support Index (ESI), which accounts for whether governments provide income

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<sup>2</sup> Argentina, Brazil, Bulgaria, Colombia, Chile, Czech Rep., Egypt, Estonia, Hungary, India, Indonesia, Lithuania, Malaysia, Mexico, Peru, Philippines, Poland, Romania, Russia, South Africa, Saudi Arabia, South Korea, South Africa, Turkey, and Ukraine. All data were obtained from Haver Analytics.

support, debt relief programs, or any additional fiscal measures. Such an index is a more limited measure because it does not cover all fiscal support packages. However, it has the advantage of having some variation across time, contrary to IMF's data.

## 4 Methodology

This work follows the approach of Kamin and Kearns (2021) by estimating the following panel data model:

$$Y_{i,t} = \alpha_i + \lambda_t + \rho Y_{i,t-1} + \beta X_{i,t} + \delta \Gamma_{i,t} + \varepsilon_{i,t} \quad (1)$$

where  $Y_{i,t}$  is a variable measuring economic activity (quarterly real GDP growth, the unemployment rate, or exports growth rate) for country  $i$  at time  $t$ .  $X_{i,t}$  is a matrix containing a measure of the spread of the COVID-19 virus (the change in new confirmed cases and the change in the number of deaths per 100 thousand people) and the severity of lockdown policies implemented (represented by the change in the OSI).  $\Gamma_{i,t}$  is a matrix containing additional controls, such as the change in the policy interest rate and the ESI as proxies for monetary and fiscal support, respectively, and the interaction between deaths, the OSI, and the ESI with GDP per capita. Lastly, the growth rate of exports should be included since it is considered an essential factor in EMEs' GDP and unemployment. Finally,  $\alpha_i$  and  $\lambda_t$  represent country and time fixed effects respectively;  $\rho$ ,  $\beta$ , and  $\delta$  are the parameters to estimate; and  $\varepsilon_{i,t}$  is the error term.

The inclusion of interaction terms follows Furceri and Ostry (2021), who found that deaths and lockdown policies had a more significant economic impact in countries with higher GDP per capita. To better account for income differences within EMEs, the interaction occurs using a dummy variable equal to 1 when a country's GDP per capita is above the sample mean, as in the cited work.

Before estimating equation 1, Kamin and Kearns (2021) suggest correcting for the endogeneity problem that arises if, for example, individuals (or firms) voluntarily decide to restrict social contact (or close operations) ahead of a significant surge in the number of deaths or the implementation of harsher lockdown policies. As a result, the number of new confirmed cases falls, and economic activity will slow down, albeit not caused by a faster virus spread or more strict policies to contain the contagion (see Kamin and Kearns (2021) for a more detailed explanation).

Following the cited authors, we correct the endogeneity problem by adopting a two-step esti-

mation procedure. First, the change in the number of deaths and the change in the OSI are regressed on the change in new cases:

$$\Delta deaths_{i,t} = a_i + \gamma_1 \times \Delta cases_{i,t} + u_{i,t} \quad (2a)$$

$$\Delta OSI_{i,t} = b_i + \gamma_2 \times \Delta cases_{i,t} + e_{i,t} \quad (2b)$$

where  $a_i$ ,  $b_i$  are country fixed effects, and  $u_{i,t}$ ,  $e_{i,t}$  are the error terms having zero mean and variances  $\sigma_u^2$  and  $\sigma_e^2$  respectively.

The residuals from both regressions ( $\hat{u}_{i,t}$ ,  $\hat{e}_{i,t}$ ) stand for the differences in deaths and the OSI not explained by the contemporary change in new COVID-19 cases. Substituting the variables in the matrix  $X_{i,t}$  by such residuals, the model to estimate in the second step becomes:

$$Y_{i,t} = \alpha_i + \lambda_t + \rho Y_{i,t-1} + \beta_1 \hat{u}_{i,t} + \beta_2 \hat{e}_{i,t} + \delta \Gamma_{i,t} + \varepsilon_{i,t} \quad (3)$$

## 5 Results

We start this section by showing the results for all EMEs in our sample. First, we describe how GDP growth, the unemployment rate, and export growth were affected by the number of deaths due to COVID-19 and more stringent containment measures from 2020:Q1 to 2020:Q3. Then, we also assess if the results change when doing the estimations per year (2020 separately from 2021). Second, given the differences in the behavior of deaths and lockdown policies among EMEs, we group the countries in our sample into regions and assess whether the results diverge.

### 5.1 The Effects on GDP Growth

Table 1 column 2 shows that a rise in deaths and more severe lockdown restrictions have had statistically significant adverse impacts (estimated coefficients of  $-0.024$  and  $-0.109$ ) when using the whole sample. Unsurprisingly, as in Kamin and Kearns (2021), higher export growth is associated with higher GDP. The estimated parameter for the monetary policy variable has the correct sign (negative), but this is not statistically significant. A similar situation occurs for the ESI, meaning that even though the coefficient of this proxy of fiscal support has a positive sign, it is not significantly different from zero. Regarding the interaction terms, both of their coefficients are not

statistically significant, which suggests that there is no evidence that the economic costs of the pandemic were higher in richer EMEs.<sup>3</sup>

Table 1: 2SLS Panel Regression for Quarterly GDP Growth

	All Periods	2020	2021
Lagged $\Delta$ GDP	−0.174* (0.055)	−0.220** (0.030)	−0.476*** (0.007)
$\Delta$ Deaths	−0.0240** (0.044)	−0.0733** (0.039)	0.00794 (0.614)
$\Delta$ Stringency Index (OSI)	−0.109* (0.075)	−0.129* (0.085)	−0.101 (0.402)
$\Delta$ Exports	0.202** (0.010)	0.229** (0.035)	0.178* (0.090)
Fiscal Support	0.0333 (0.190)	0.0531 (0.195)	0.0467 (0.297)
$\Delta$ Policy Rate	−0.168 (0.296)	−0.249 (0.310)	2.971** (0.021)
Deaths $\times$ GDP per capita	0.000742 (0.975)	0.00745 (0.936)	−0.0359 (0.299)
OSI $\times$ GDP per capita	0.104 (0.101)	0.109 (0.118)	0.120 (0.357)
R-squared	0.806	0.872	0.463
Adjusted R-squared	0.788	0.856	0.374
Observations	172	100	72
Groups	25	25	25

p-values from country-based cluster robust standard errors in parenthesis

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

For the most part, the above results agree with the findings for advanced economies in other works such as Gagnon, Joseph E., Kamin, Steven, and Kearns, John. (2021). However, as mentioned in Section 2, the pandemic’s dynamics were somewhat different in 2020 than in 2021 because the advances in population vaccination and less strict lockdown policies might have led to a gradual reactivation of economic activity or a resurgence in the number of cases prompt some economies to reactivate containment measures. Hence, we reestimate equation 2 using data for 2020 and 2021 separately to assess whether such differences affect the results.

For the 2020 sample, the findings are similar to those discussed above: The negative coefficients of deaths and containment policies (−0.073 and −0.129, respectively), and the positive one

<sup>3</sup>We estimate Equation 3 using country-based cluster robust standard errors. This is because the tests rejected the presence of serial correlation and cross-section dependence, see Appendix H Tables H1 and H2.

for exports (0.229) are statistically significantly different from zero. Note, however, that the coefficients are higher in absolute value than before. In particular, the estimated parameter of deaths is now three times higher (the increase in the OSI and exports' effect was not as dramatic). Lastly, as seen for the whole sample case, despite the coefficients of fiscal and monetary support variables having the correct sign, they remained statistically indistinguishable from zero along with the interaction terms (Table 1 column 3).

The results are not that straightforward for 2021. The estimated parameters for deaths and lockdown measures are not significantly different from zero. Such a result was unexpected, given that some EMEs suffered from a marked rebound of cases and deaths during the second and third quarters, as mentioned in Section 2. Exports remain a positive and essential factor for GDP growth, although the estimated coefficient is smaller than the previous results. Unexpectedly, the coefficient of changes in the policy rate is positive and significant, while the parameters of fiscal support and the interaction terms remain not statistically significant (Table 1 column 4). Note that the estimated coefficients of deaths differ in their magnitude. The results for 2020 show a value of 0.073, while in 2021, the coefficient is quite small (0.007) and not statistically significantly different from zero.

## 5.2 The Effects on the Unemployment Rate

Before describing the results, it is important to highlight that in contrast to the previous case, the model for the unemployment rate exhibits cross-section dependence in the residuals. In addition, one of the three tests for serial correlations suggests that this is also present; see Tables H3 and H4 in the Appendix. Hence, when estimating the model for unemployment, we make use of Driscoll-Kraay's standard errors. Table 2, column 2 shows that deaths per 100 thousand people are associated with a higher unemployment rate (a coefficient of 0.0142), while unexpectedly, the parameter for containment measures was not statistically significantly different from zero. The results also show a positive, albeit small, statistically significant coefficient (0.008) of fiscal support, which could be a consequence of governments' fiscal stimulus packages to support the populations that might have motivated some fraction of it not to go back to the workplace, pushing unemployment up in labor-intensive sectors. In turn, the positive significant coefficients of the interaction between the OSI and GDP per capita may indicate that richer EMEs faced more elevated costs (in terms of unemployment) during the pandemic. Lastly, the deterioration of external demand has a statistically significant negative coefficient ( $-0.004$ ).

Surprisingly, the 2020 results show no statistically significant coefficient for deaths and containment policies (even more, the estimated parameters have a negative sign). The only conclusion derived from this part is that lower exports are associated with a higher unemployment rate (a



statistically significant coefficient of  $-0.008$ ) and that higher-income EMEs suffered more from stringent lockdown measures (a statistically significant coefficient of  $-0.012$ ), see Table 2, column 3. In turn, in 2021, the number of casualties due to COVID-19 had a significant positive effect of around (estimated coefficient of  $0.026$ ). Finally, the coefficient of the interaction term between GDP per capita and containment measures is also positive and statistically significant, supporting the idea that richer countries may have experienced more elevated economic costs (Table 2, column 4).

Table 2: 2SLS Panel Regression for Unemployment

	All Periods	2020	2021
Lagged unemp	0.798*** (0.000)	0.512*** (0.003)	0.498*** (0.000)
$\Delta$ Deaths	0.0142* (0.072)	$-0.0125$ (0.328)	0.0267** (0.023)
$\Delta$ Stringency Index (OSI)	0.00872 (0.172)	$-0.00725$ (0.280)	0.0150 (0.280)
$\Delta$ Exports-Mach	$-0.00434^*$ (0.099)	$-0.00878^{**}$ (0.027)	0.000342 (0.852)
$\Delta$ Fiscal Support	0.00809* (0.083)	0.00590 (0.388)	$-0.00165$ (0.636)
$\Delta$ policy rate	$-0.0730$ (0.431)	0.0574 (0.321)	$-0.113$ (0.361)
Deaths $\times$ GDP per capita	$-0.00988$ (0.455)	0.00457 (0.666)	$-0.0204$ (0.117)
OSI $\times$ GDP per capita	0.00692* (0.053)	0.0122** (0.025)	0.0167*** (0.000)
Within R-squared	0.5286	0.3420	0.4144
Observations	566	268	225
Groups	25	25	25

p-values in parenthesis from Driscoll-Kraay standard errors

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The previous results can be explained by looking at unemployment rate dynamics (Appendix D). We observe that most countries in our sample saw a marked increase in unemployment during the first half of 2020, followed by an accelerated fall within the same year. In contrast, during 2021, some EMEs exhibited an upturn in unemployment, while in other economies, there were no changes.<sup>4</sup> At the same time, several EMEs saw an upturn in the number of contagions during 2021

<sup>4</sup>These countries are Brazil, Chile, Czech Rep., Hungary, Peru, Russia, South Korea, Turkey, and Ukraine. Also, the data shows no change in the unemployment rate during 2020-21 in Argentina, Bulgaria, Estonia, Lithuania, and Saudi Arabia.

and, in several cases, in a higher number than the previous year, see Figure 2a-2c above. It led such economies to impose harsher lockdown policies (see Appendix B).<sup>5</sup>

### **5.3 The Effects on Export Growth**

As occurred for the unemployment case, the export growth model also suffers from cross-section dependence in the residuals. In addition, the model suffers from serial correlation; see Tables H5 and H6 in the Appendix. Unfortunately, the results for exports are somewhat less enlightening than those for GDP and the unemployment rate. First, the results for all periods indicate that lockdown measures and fiscal support had a significant negative impact (estimated coefficients of  $-0.373$  and  $-0.078$ , respectively), see Table 3, column 2. One reason for the negative sign of the fiscal support parameter may be that during the first months of the pandemic, exports fell while the government directed more resources to help the economy. In addition, and as mentioned above, people not going back to work in labor-intensive sectors because of fiscal support may also contribute to such a negative coefficient. Second, by restricting the analysis to 2020, we find lockdown restrictions to be the only variable with a statistically significant coefficient ( $-0.446$ ). A similar result is found for 2021, but although the estimated coefficient of containment measures is statistically different from zero, it is of a smaller magnitude ( $-0.081$ ), see Table 3, columns 3 to 4.

### **5.4 Regional Analysis**

Although the previous results shed some light on the macroeconomic impact of the pandemic in EMEs, the fact that there were differences in the dynamics of deaths and the harshness of lockdown measures across such economies (see section 2) highlights the importance of taking into account these discrepancies to improve the results. For that purpose, we group the countries in our sample into three regions: Asia and the Middle East, emerging Europe, and Latin America. Hence, we proceed with the same steps as in the previous subsections.

### **5.5 Regional GDP Growth**

Unfortunately, in some cases, data restrictions prevent us from obtaining results per year.<sup>6</sup> For instance, our sample only has six Latin American countries, which is not a big enough number

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<sup>5</sup>For example, Brazil, Chile, Colombia, Czech Rep., Hungary, India, Indonesia, Peru, Russia, South Korea, and Turkey.

<sup>6</sup>At the time of writing this article, most emerging economies have not reported quarterly data on real GDP and exports.

Table 3: 2SLS Panel Regression for Exports Growth

	All Periods	2020	2021
Lagged $\Delta$ Exports	−0.134* (0.062)	−0.115 (0.116)	−0.457*** (0.002)
$\Delta$ Deaths	0.115 (0.123)	0.0323 (0.860)	0.0809 (0.679)
$\Delta$ Stringency Index (OSI)	−0.373*** (0.001)	−0.446*** (0.002)	−0.0817** (0.015)
$\Delta$ Fiscal Support	−0.0786* (0.062)	−0.105 (0.102)	−0.0120 (0.827)
$\Delta$ policy rate	0.785 (0.190)	0.377 (0.588)	2.718 (0.212)
Deaths $\times$ GDP per capita	0.0345 (0.646)	0.123 (0.317)	0.0176 (0.583)
OSI $\times$ GDP per capita	0.0197 (0.673)	−0.00910 (0.906)	0.127** (0.012)
Within R-squared	0.2567	0.3491	0.2692
Observations	598	286	234
Groups	26	26	26

p-values in parenthesis from Driscoll-Kraay standard errors

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ 

to get results separately for 2020 and 2021. Similarly, with only eight countries in Asia and the Middle East, we can't estimate the model for 2021. Then, in this case, we report data for all periods only.<sup>7</sup>

Findings using data from the first quarter of 2020 to the third quarter of 2021 show that stricter containment policies in Asia and the Middle East are associated with lower GDP growth (estimated coefficient of  $-0.204$ ). Similarly, the parameter of the interaction of deaths and GDP per capita is negative and statistically significantly different from zero, which agrees with the previous results that wealthier countries could have faced higher economic costs due to increased deaths (Table 4, column 2). Our results for emerging Europe suggest that the impact of lockdown policies on growth may have been smaller (estimated coefficient of  $-0.086$ ). As before, higher exports had a positive and statistically significant coefficient (Table 4, column 3).

In the case of Latin America (Table 4, column 4), the results indicate that the impact of deaths per 100 thousand people and strict containment policies was negative and statistically significant (estimated coefficients of  $-0.040$  and  $-0.448$ , respectively). Also, we found that exports and

<sup>7</sup>We exclude time-fixed effects in the regressions by region since these are not statistically significant.

fiscal support are associated with higher GDP growth (estimated coefficient of 0.234 and 0.101, respectively), while the policy rate is negative and significantly different from zero (a coefficient of  $-0.659$ ). Whether richer Latin American countries suffered more during the pandemic, the positive sign of the interaction between the OSI and GDP per capita opposes such a notion. However, one must note that the Latin American countries in our sample, but Chile, relaxed lockdown policies from the third quarter of 2020 onward, while also during such a period, their GDP growth rate slowed down. Such dynamics in the same direction of both variables may be why the interaction exhibits a positive sign.

Table 4: 2SLS Panel Regression for Quarterly GDP Growth by Region

	Asia and Middle East	Emerging Europe	Latin America
Lagged $\Delta$ GDP	$-0.206^{**}$ (0.035)	$-0.118$ (0.456)	$-0.109$ (0.102)
$\Delta$ Deaths	$0.0795$ (0.701)	$0.00338$ (0.882)	$-0.0407^*$ (0.060)
$\Delta$ Stringency Index (OSI)	$-0.204^*$ (0.094)	$-0.0863^*$ (0.067)	$-0.448^{***}$ (0.002)
$\Delta$ Exports	$0.131$ (0.475)	$0.359^{***}$ (0.003)	$0.234^*$ (0.099)
Fiscal Support	$-0.0141$ (0.811)	$-0.0417$ (0.318)	$0.101^{**}$ (0.026)
$\Delta$ Policy Rate	$-0.963$ (0.414)	$0.244$ (0.398)	$-0.659^{**}$ (0.031)
Deaths $\times$ GDP per capita	$-0.0000187$ (0.149)	$0.000000399$ (0.776)	$-0.0000117$ (0.629)
OSI $\times$ GDP per capita	$0.00000310$ (0.251)	$0.00000153$ (0.506)	$0.0000122^{***}$ (0.006)
R-squared	0.613	0.834	0.903
Adjusted R-squared	0.545	0.815	0.879
Observations	55	76	41
Groups	8	11	6

p-values from country-based cluster robust standard errors in parenthesis

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 5.6 Regional Unemployment

In contrast to the previous case, the advantage of using the unemployment rate lies in the availability of monthly data. Hence, we can now get results for all periods, 2020 and 2021, for all three regions.

Table 5, columns 2 to 4, shows the results for Asia and the Middle East. When estimating the model for all periods, we observe that deaths per 100 thousand people had a positive impact on the unemployment rate in the region (an estimated coefficient of 0.056) in the results for the whole sample. Breaking down the analysis per year, we see deaths in 2020 associated with a higher unemployment rate (estimated coefficient of 0.677). Also, for such a year, the results show a positive and statistically significant coefficient of the interaction term between the OSI index and GDP per capita, suggesting that richer countries faced a higher cost in terms of unemployment from a stricter lockdown. By 2021, none of these factors were statistically different from zero effect, probably due to the recovery of economic activity and employment, among other factors.

Looking at Emerging Europe, Table 5, columns 5 to 7, we observe that the results for all periods do not provide any insight. The results for 2020 only show that stricter policies had a bigger impact on more affluent countries (a statistically positive coefficient of 0.011). By 2021, as in the previous case, no significant factor was found in emerging Europe.

In the case of Latin America, for all periods, the results suggest that only deaths had a positive impact on the unemployment rate. In turn, the coefficient of the interaction term between OSI and GDP per capita suggests that richer economies may have faced bigger challenges in terms of unemployment during 2020 (estimated coefficient of 0.017). By 2021, the positive coefficient of deaths was statistically significant. On average, Asia and the Middle East, and Latin America were the most sensitive regions to an increase in deaths per 100,000 people.

## 5.7 Regional Exports

Before discussing the results, it is important to underscore that the model needs to account for the evolution of external demand in the case of exports. Time-fixed effects may be a way to approximately achieve this. Then, looking at the results for all periods in Asia and the Middle East, we found that lockdown measures had a significantly different from zero negative impact on export growth (estimated coefficient of  $-0.306$ ). As in the previous section, fiscal support has a negative and statistically significant coefficient ( $-0.129$ ). A possible explanation is that in early 2020, exports were falling due to supply chain restrictions while fiscal support was rising in several economies. The results for 2020 are similar, but the magnitude of the coefficients is higher. For example, containment measures and fiscal support estimated coefficients became  $-0.329$  and  $-0.219$ , respectively. In 2021, no statistically significant factor was found. This may be explained, among other factors, by the fall in deaths, the relaxation of confinement measures, and the reactivation of economic activity (see Table 6, columns 2 to 4).

Table 5: 2SLS Panel Regression for Unemployment by Region

	Asia and Middle East			Emerging Europe			Latin America		
	All Periods	2020	2021	All Periods	2020	2021	All Periods	2020	2021
Lagged unemp	0.729*** (0.000)	0.663** (0.011)	0.432* (0.057)	0.843*** (0.000)	0.633** (0.019)	0.622*** (0.001)	0.569*** (0.000)	0.434* (0.067)	0.190* (0.095)
$\Delta$ Deaths	0.0564*** (0.009)	0.677* (0.067)	0.0176 (0.588)	0.00377 (0.625)	0.000487 (0.926)	-0.00841 (0.191)	0.0503* (0.078)	-0.0204 (0.406)	0.0898** (0.025)
$\Delta$ Stringency Index (OSI)	0.00207 (0.841)	-0.0131 (0.470)	0.00492 (0.690)	0.00772 (0.461)	-0.00350 (0.533)	0.0111 (0.208)	0.0149 (0.321)	-0.000594 (0.966)	0.0225 (0.530)
$\Delta$ Exports-Mach	-0.0329 (0.116)	-0.0402 (0.113)	-0.000950 (0.798)	0.00257 (0.613)	0.00575 (0.550)	-0.00153 (0.401)	-0.000960 (0.829)	-0.00374 (0.663)	0.00351 (0.288)
$\Delta$ Fiscal Support	0.00592 (0.243)	0.00165 (0.823)	-0.00148 (0.759)	0.00804 (0.232)	0.00580 (0.599)	-0.00195 (0.391)	0.0287 (0.165)	0.0175 (0.138)	0.00720 (0.526)
$\Delta$ policy rate	0.0419 (0.948)	0.248 (0.637)	-0.681 (0.452)	-0.210 (0.247)	-0.107 (0.169)	-0.00786 (0.969)	-0.134 (0.167)	0.0324 (0.320)	-0.183 (0.815)
Deaths $\times$ GDP per capita	0.363 (0.116)	-0.220 (0.333)	0.345 (0.384)	-0.00609 (0.521)	-0.0112* (0.095)	-0.000263 (0.949)	-0.00946 (0.766)	0.0438 (0.301)	-0.0512 (0.510)
OSI $\times$ GDP per capita	0.0137 (0.250)	0.0236*** (0.003)	0.0268 (0.142)	-0.000230 (0.985)	0.0116** (0.027)	-0.00254 (0.645)	0.00424 (0.692)	0.0170* (0.070)	-0.00473 (0.919)
R-squared									
Observations	183	88	72	253	121	99	130	59	54
Groups									

*p*-values in parentheses

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 6: 2SLS Panel Regression for Exports Growth by Region

	Asia and Middle East			Emerging Europe			Latin America		
	All Periods	2020	2021	All Periods	2020	2021	All Periods	2020	2021
Lagged $\Delta$ Exports	−0.211** (0.048)	−0.166 (0.195)	−0.478*** (0.001)	−0.170 (0.147)	−0.170 (0.244)	−0.409*** (0.001)	−0.0603 (0.642)	0.0273 (0.842)	−0.515** (0.025)
$\Delta$ Deaths	0.304 (0.228)	10.21 (0.126)	0.364 (0.196)	0.0827 (0.264)	0.0880 (0.417)	−0.00983 (0.870)	0.162 (0.228)	0.0946 (0.705)	0.0352 (0.788)
$\Delta$ Stringency Index (OSI)	−0.306** (0.031)	−0.329** (0.041)	−0.0444 (0.764)	−0.375*** (0.004)	−0.460*** (0.003)	−0.200 (0.151)	−0.407*** (0.007)	−0.569*** (0.004)	−0.00398 (0.969)
$\Delta$ Fiscal Support	−0.129** (0.032)	−0.219** (0.045)	−0.00597 (0.900)	−0.0878 (0.149)	−0.120 (0.176)	−0.0273 (0.782)	0.0388 (0.536)	0.135 (0.267)	0.137 (0.268)
$\Delta$ policy rate	5.864*** (0.008)	6.143** (0.014)	5.212 (0.445)	0.706 (0.523)	−0.166 (0.925)	1.733 (0.430)	0.226 (0.684)	−0.482* (0.075)	7.057 (0.341)
Deaths $\times$ GDP per capita	−0.895 (0.269)	−5.458 (0.180)	−2.876 (0.504)	0.0919 (0.264)	0.177* (0.099)	0.0441 (0.361)	−0.454 (0.143)	−0.544 (0.186)	1.276 (0.161)
OSI $\times$ GDP per capita	0.144*** (0.006)	0.304** (0.038)	−0.00311 (0.984)	−0.0264 (0.648)	−0.0842 (0.381)	−0.00182 (0.953)	0.191*** (0.008)	0.145 (0.282)	−1.007 (0.187)
R-squared									
Observations	207	99	81	253	121	99	138	66	54
Groups									

*p*-values in parentheses

Country and time fixed effects included but not reported.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The results for Emerging Europe show that lockdown measures are associated with lower export growth (an estimated coefficient of  $-0.375$ ). Still, surprisingly, the coefficient for deaths was not statistically significant. Such results remain by 2020, while no statistically significant impact is observed for 2021 (see Table 6, columns 5 to 7).

Lastly, in the case of Latin America, the results for all periods suggest that lockdown restrictions had a negative impact on exports (a coefficient of  $-0.407$ ). Restricting the sample to 2020, containment measures are the only variable with a statistically significant coefficient ( $-0.569$ ). In turn, monetary policy has a negative statistical coefficient of  $-0.482$ , indicating that lower policy rates are associated with higher export growth. As before, no statistically significant effect was found during 2021 (see Table 6, columns 8 to 10).

## 6 Robustness Tests

We contrast our results for GDP against the same model without time-fixed effects in Table I1 of Appendix I. The results show that the magnitude of the estimated parameters increases with only country-fixed effects, but there are no differences in their signs. Still, there are some changes in the significance of some variables. For example, when time-fixed effects are not included, deaths do not become significantly different from zero, but the interaction term between the OSI and GDP per capita does. This occurs whether the estimation used all periods or only for 2020 (columns 1 and 4).

In turn, the results for 2021 without time-fixed effects show the interaction term between deaths per 100 thousand people and GDP per capita become statistically significant, while the change in the policy rate does not. These results align with what one expects given the evolution in the number of deaths in Latin America, and Asia and the Middle East in such a period (Table I1, columns 5 and 6). However, since time-fixed effects are significant, there are still fluctuations in GDP growth that the included covariates cannot explain.<sup>8</sup>

Kamin and Kearns (2021) suggest that more prosperous countries were able to implement broader fiscal support packages to fight the pandemic. Hence, we interact the ESI with GDP per capita (Appendix I tables I2 to I4). The new interaction term is not statistically relevant in any case. However, two changes are worth mentioning for the model using GDP growth. First, when using all periods, the interaction between OSI and GDP per capita significantly differs from zero. Also, the results for 2021 show that the export coefficient lost its significance level when the new interaction term was introduced. In contrast, the unemployment rate and export growth results do

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<sup>8</sup>Kamin and Kearns (2021) also prefer a model with time-fixed effects.



not exhibit any change after the introduction of the new interaction term. In other words, there is no evidence that fiscal support packages helped more high-income EMEs to reduce the unemployment rate or boost exports.

## 7 Conclusion

The COVID-19 pandemic has generated severe losses in the world economy, particularly in emerging market economies, which, at the beginning of the pandemic, had to withstand the challenges of the pandemic and its domestic repercussions while facing the deterioration of external demand.

This work aims to analyze the impact of the COVID-19 pandemic on emerging economies. Using a panel data model, we estimate how the spread of the COVID-19 virus affected GDP growth, the unemployment rate, and export growth from the first quarter of 2020 to the third quarter of 2021 in a sample of 25 countries. Furthermore, given the differences in the dynamics of deaths and confinement measures between these economies, we group them into three regions (Asia and the Middle East, emerging Europe, and Latin America). This analysis contributes to the differentiated effects of the pandemic between regions of emerging economies and, by including data from up to one year after the onset of COVID-19, allows the impacts of variations in deaths and confinement to be compared.

The results for the entire analysis period suggest that the confinement measures were associated with lower GDP growth in all regions. However, there are some differences in the size of the estimated coefficients across regions, with Latin America being the most sensitive region to a stricter lockdown, followed by Asia and the Middle East. In turn, the results indicate that in 2020, the number of deaths was associated with a higher unemployment rate in Asia and the Middle East. In contrast, in the 2021 analysis, it was found that the coefficient of deaths is statistically significant only in Latin America. This may be explained, among other factors, by the rebound in the number of deaths in the first months of the year in some countries of the region.

Finally, stricter confinement measures were associated with lower export growth in all regions during 2020, with Latin America having the most negative coefficient. In 2021, the estimated coefficients were not statistically different from zero in any of the three regions, which could be due, among other reasons, to the relaxation in confinement measures and the recovery of global economic activity.

Although emerging economies faced unprecedented challenges during the pandemic, the differentiated effects between regions underline the importance of studying the impact and consequences of COVID-19 at the regional level. This information could be useful, to some extent, to

inform those responsible for macroeconomic policies about the impact on different institutional frameworks.

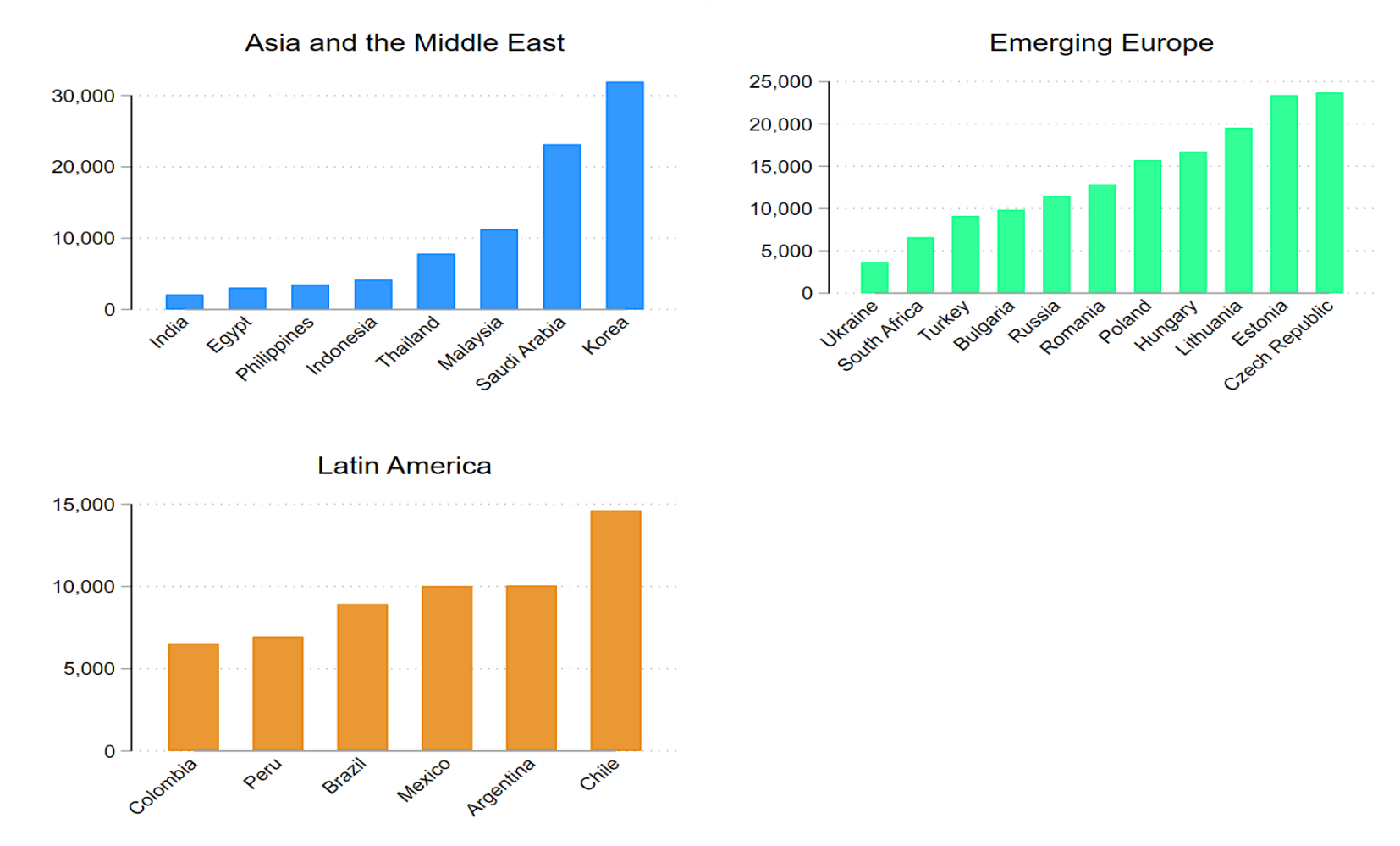
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## A Appendix

Figure A.1: 2019 GDP per Capita in USD



Source: Haver Analytics.

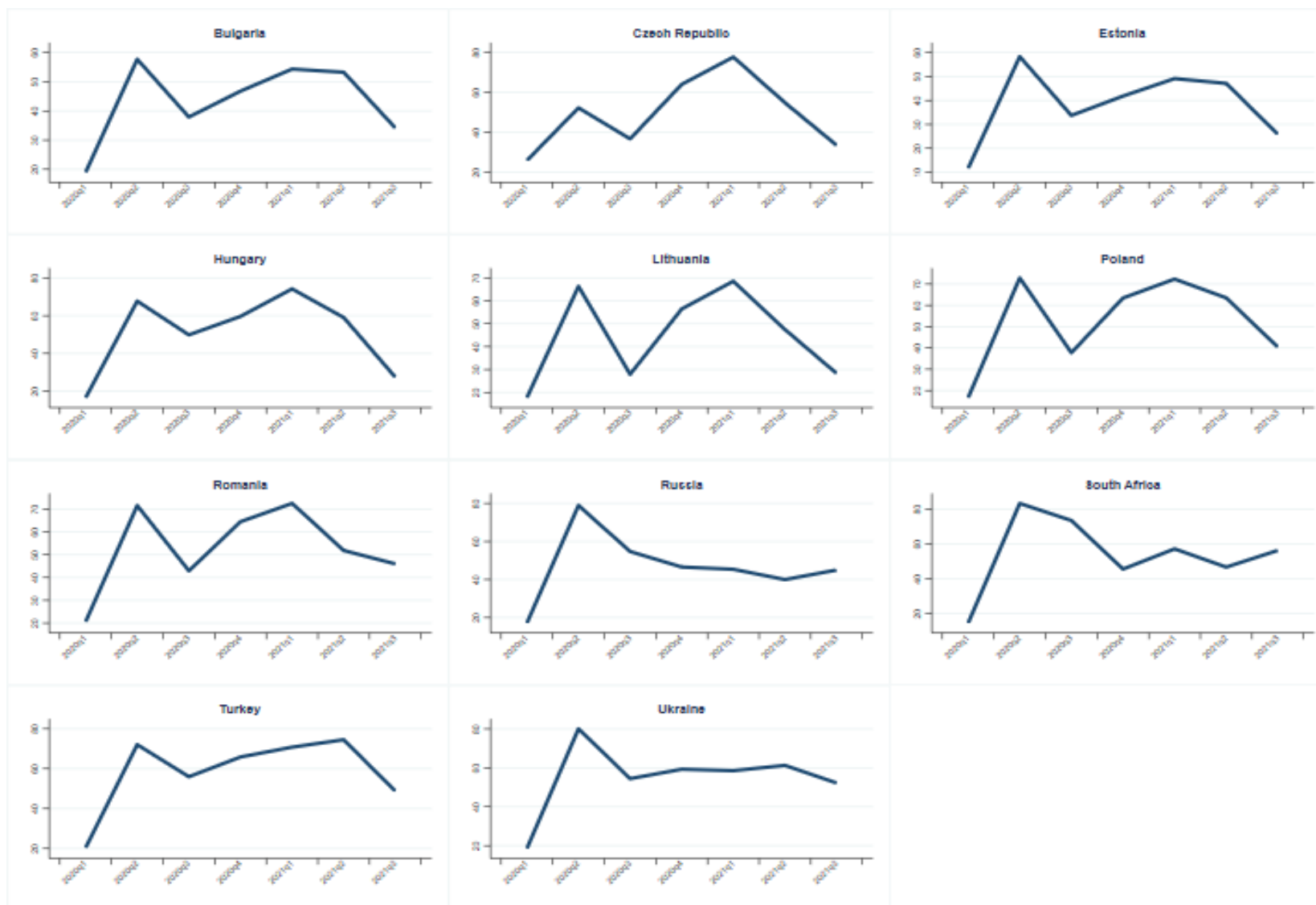
## B Appendix

Figure B.1: Severity of Lockdown Policies in Latin America



Source: Oxford's COVID-19 Government Response Tracker<sup>4</sup> (OSI).

Figure B.2: Severity of Lockdown Policies in Emerging Europe



Source: Oxford's COVID-19 Government Response Tracker<sup>4</sup> (OSI).

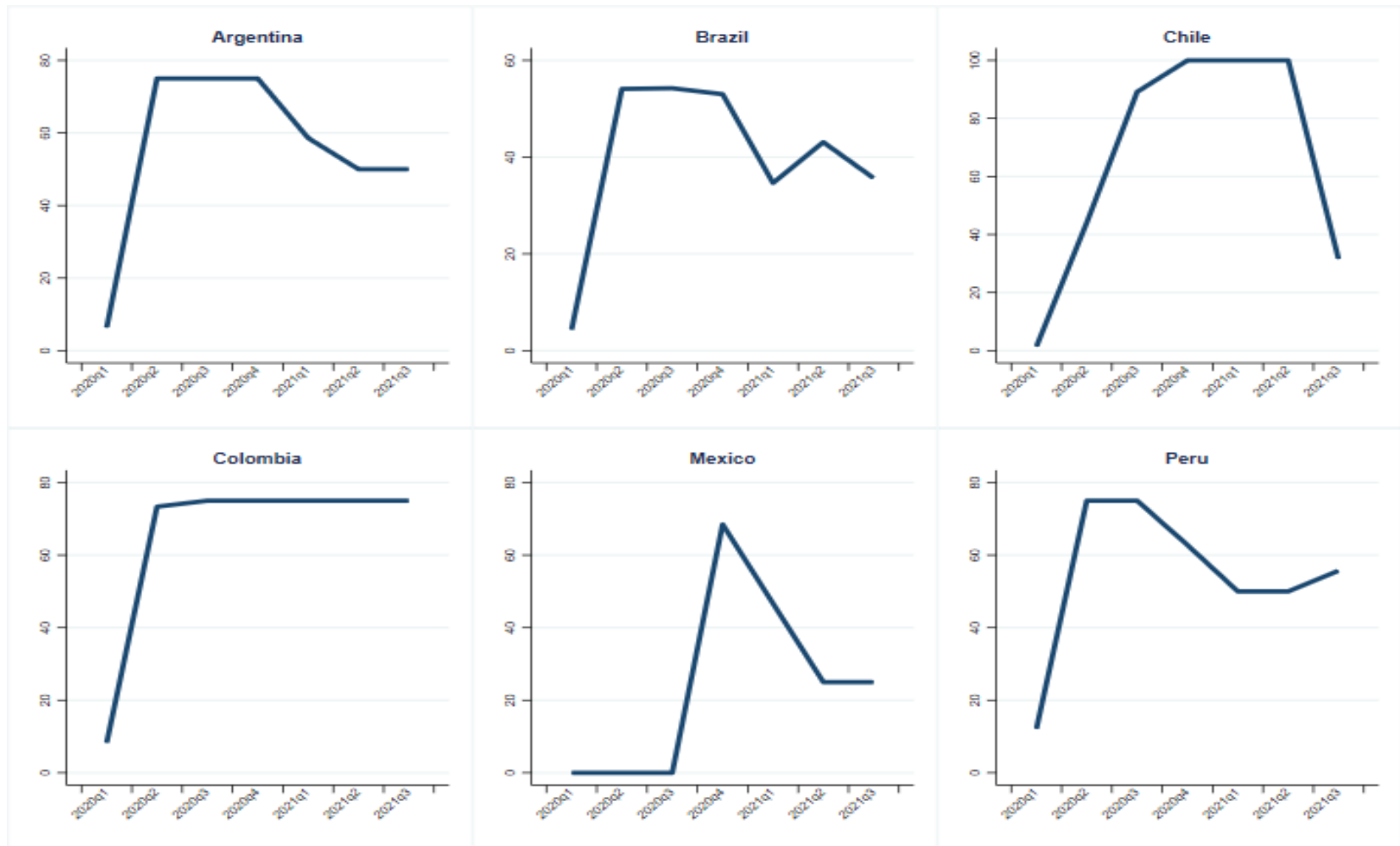
Figure B.3: Severity of Lockdown Policies in Emerging Asia and the Middle East



Source: Oxford's COVID-19 Government Response Tracker<sup>4</sup> (OSI).

## C Appendix

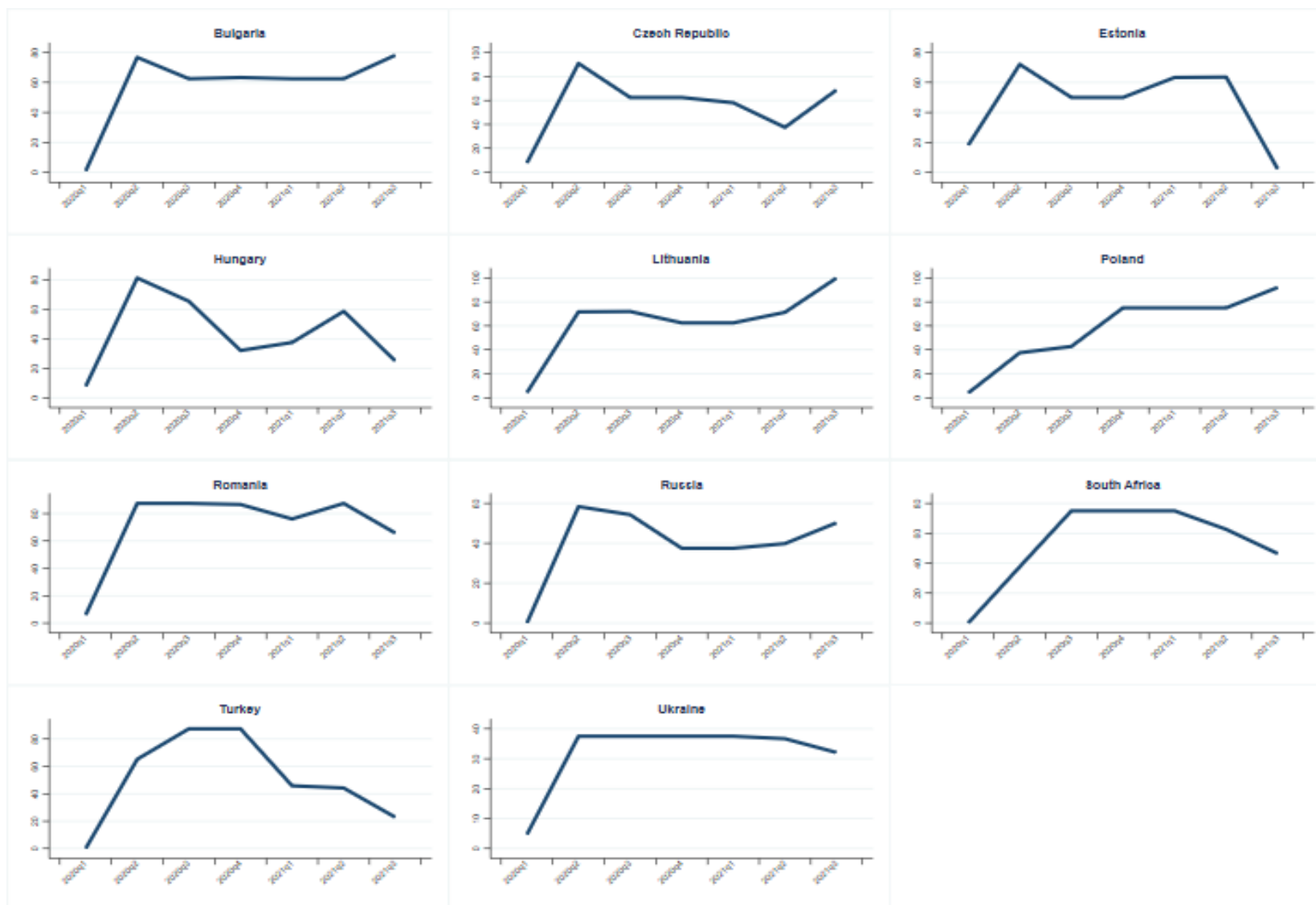
Figure C.1: Economic Support Index in Latin America



Source: Oxford's COVID-19 Government Response Tracker4 (OSI).



Figure C.2: Economic Support Index in Emerging Europe



Source: Oxford's COVID-19 Government Response Tracker<sup>4</sup> (OSI).

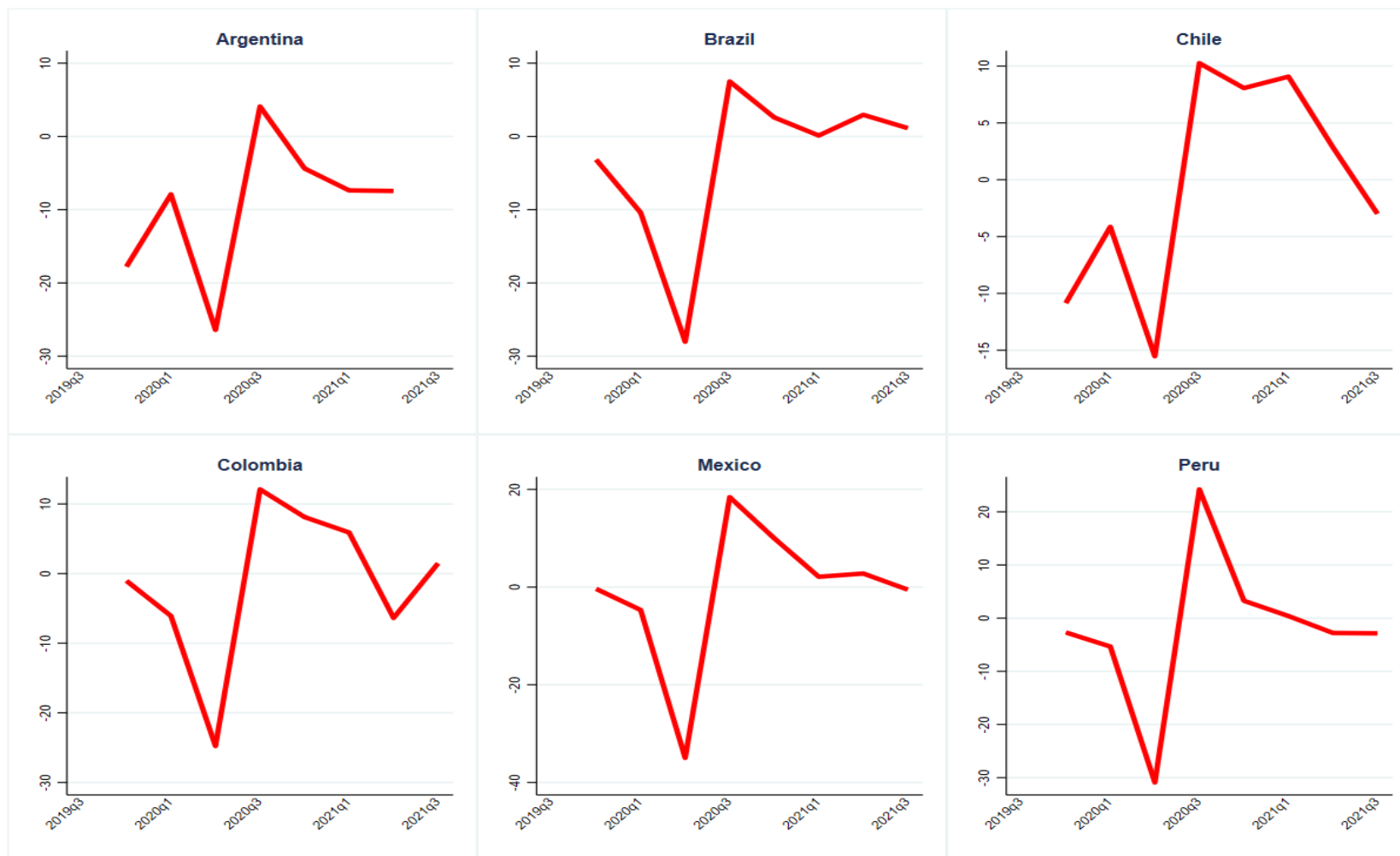
Figure C.3: Economic Support Index in Emerging Asia and the Middle East



Source: Oxford's COVID-19 Government Response Tracker<sup>4</sup> (OSI).

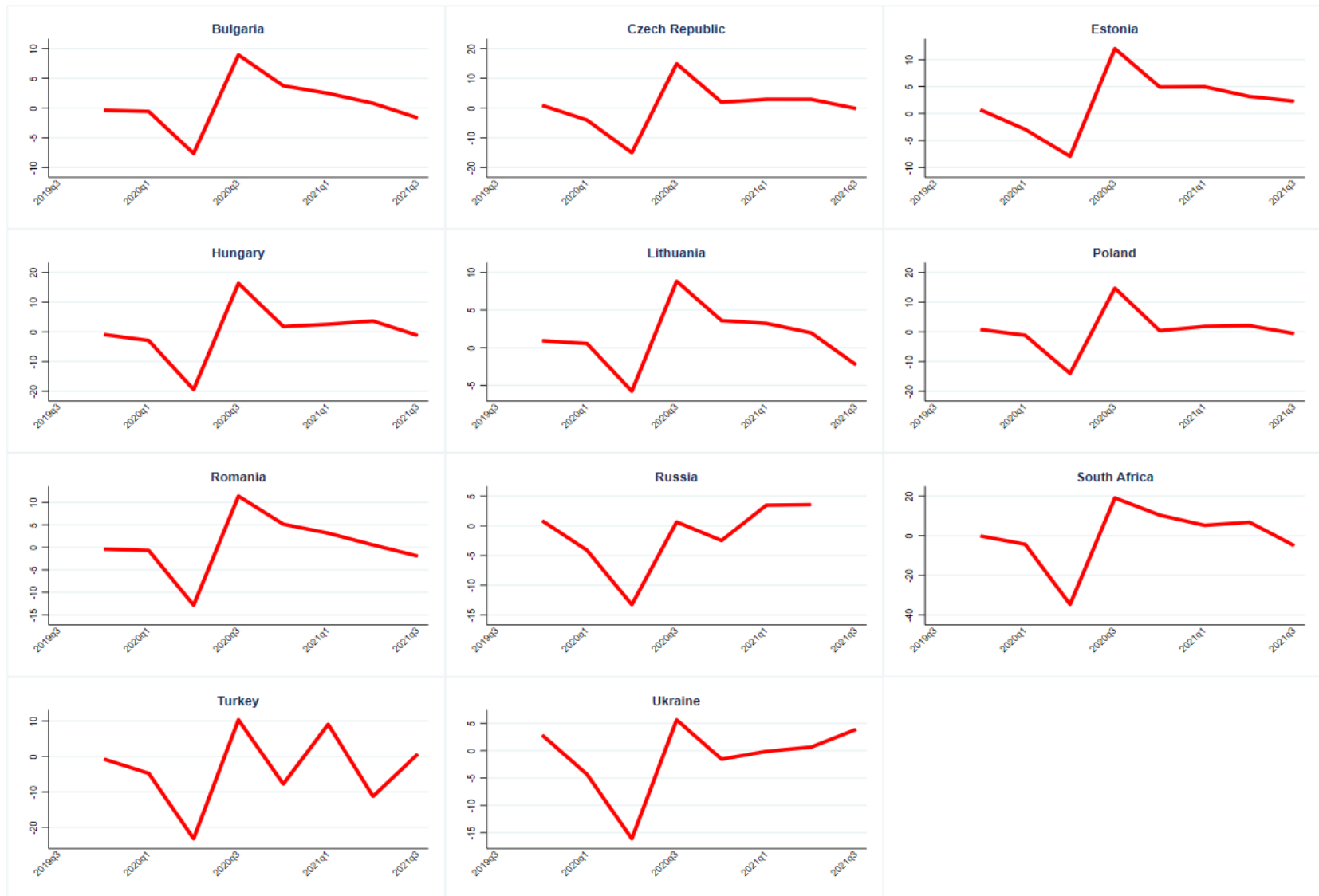
## D Appendix

Figure D.1: Quarterly GDP Growth in Latin America



Source: Haver Analytics.

Figure D.2: Quarterly GDP Growth in Emerging Europe



Source: Haver Analytics.

Figure D.3: Quarterly GDP Growth in Emerging Asia and the Middle East



Source: Haver Analytics.

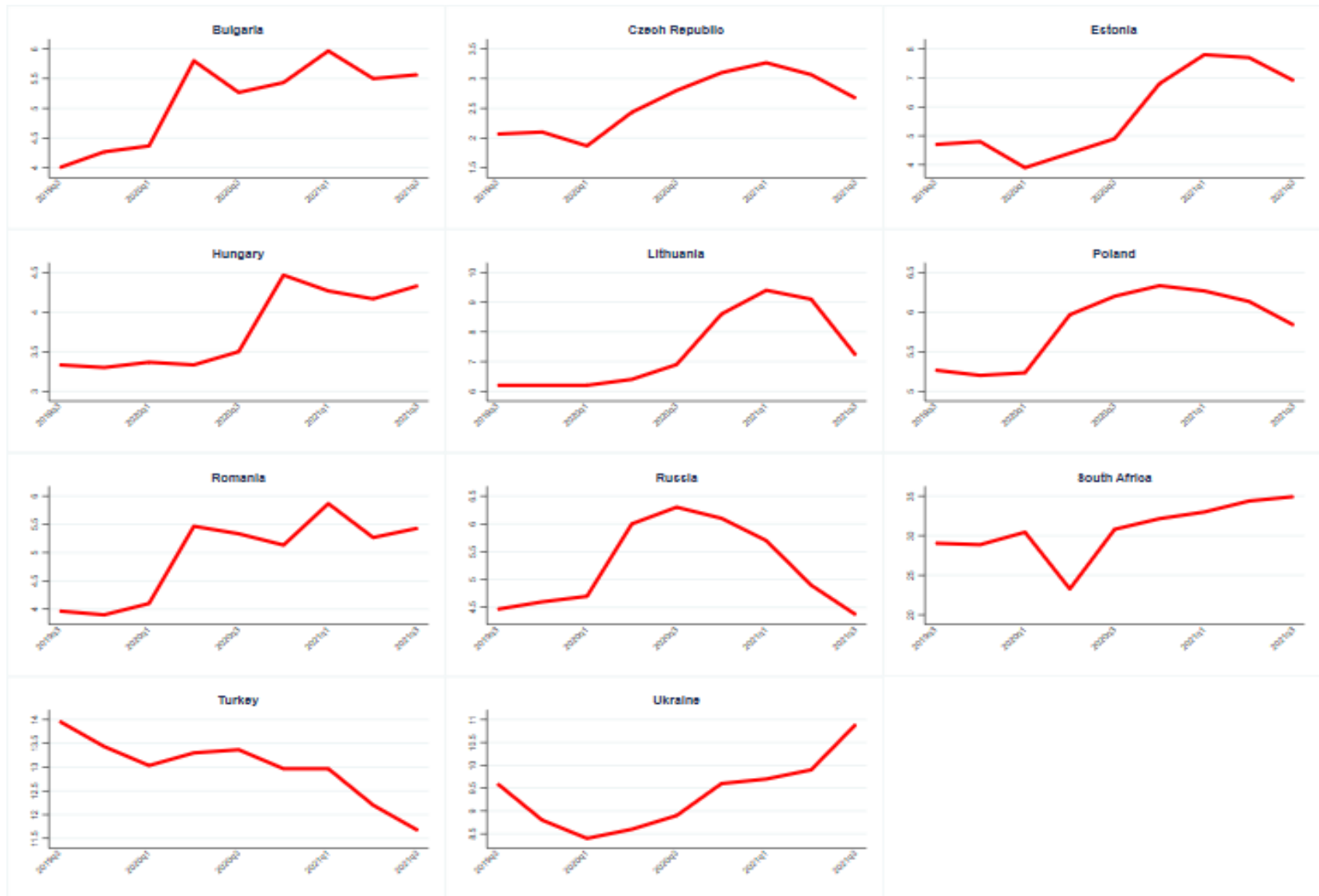
## E Appendix

Figure E.1: Unemployment Rate in Latin America



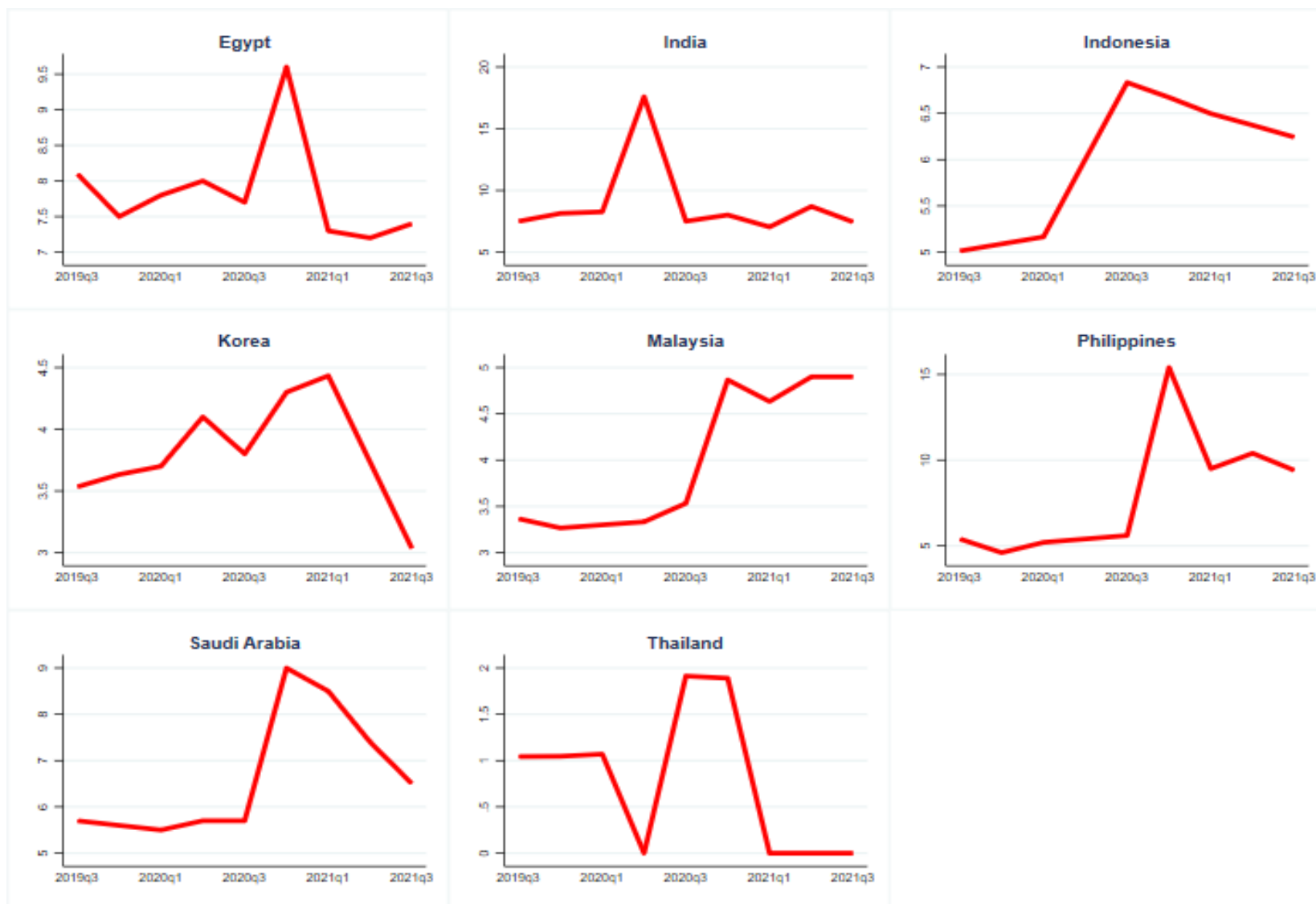
Source: Haver Analytics.

Figure E.2: Unemployment Rate in Emerging Europe



Source: Haver Analytics.

Figure E.3: Unemployment Rate in Emerging Asia and the Middle East

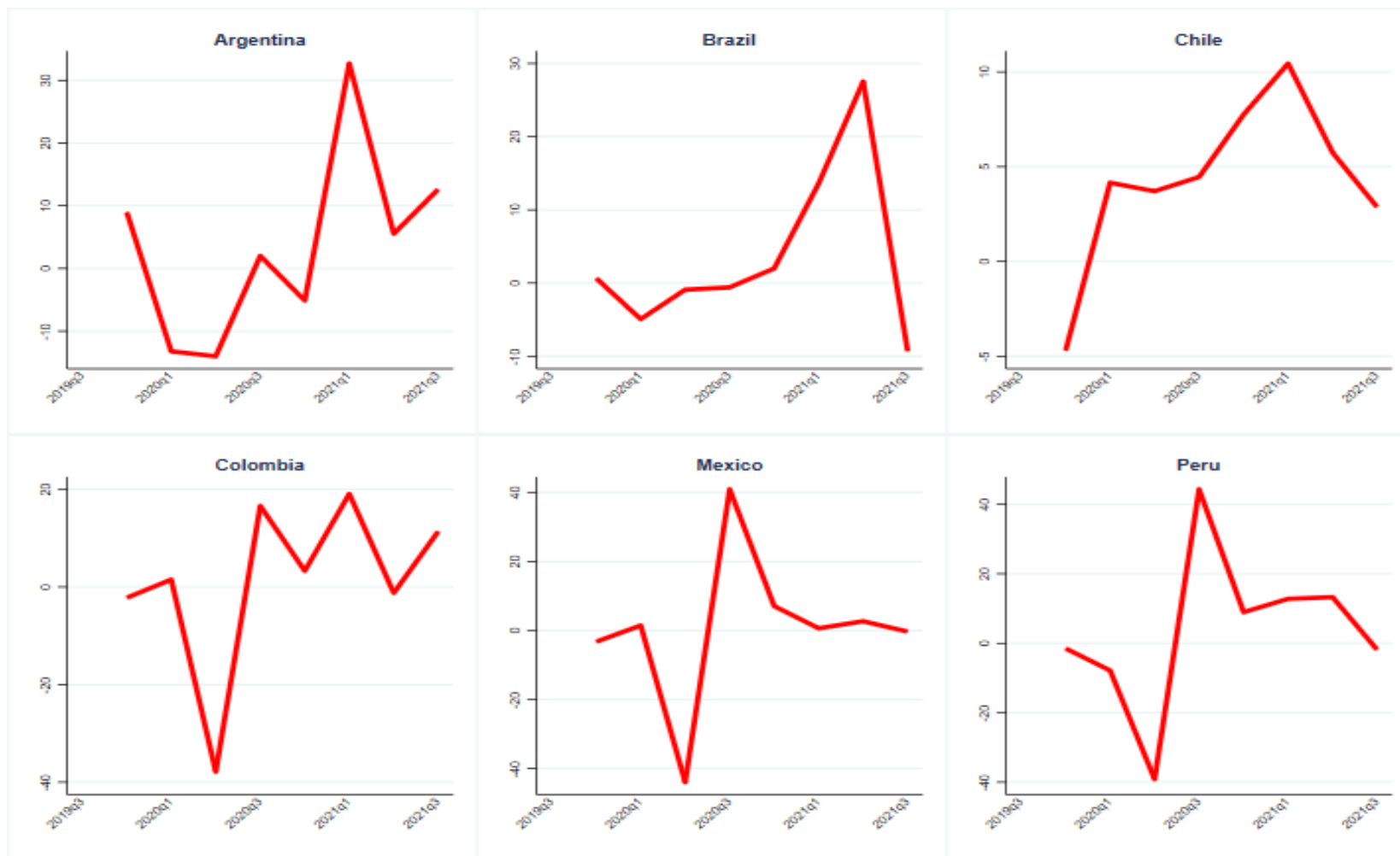


Source: Haver Analytics.



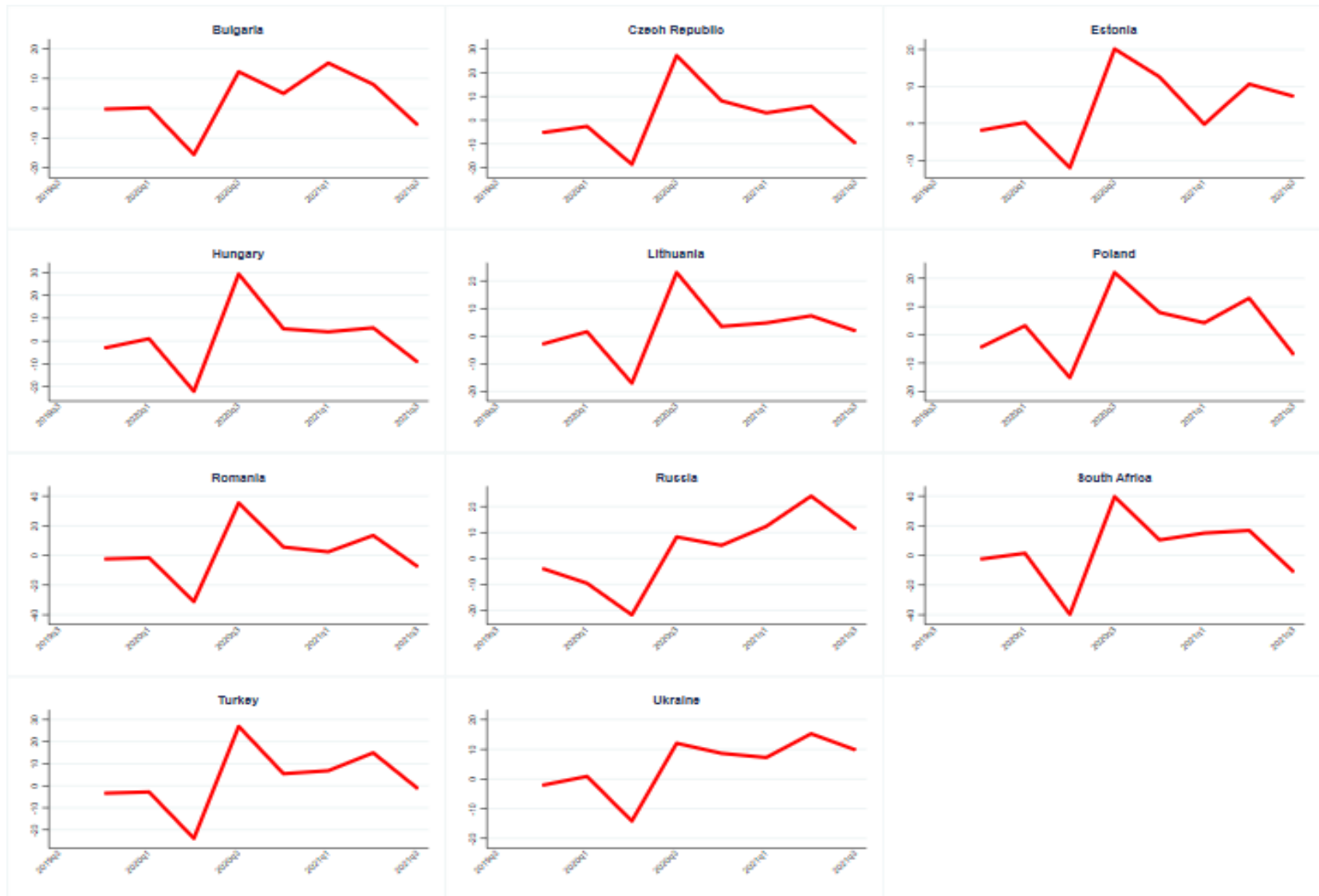
## F Appendix

Figure F.1: Exports Growth in Latin America



Source: Haver Analytics.

Figure F.2: Exports Growth in Emerging Europe



Source: Haver Analytics.

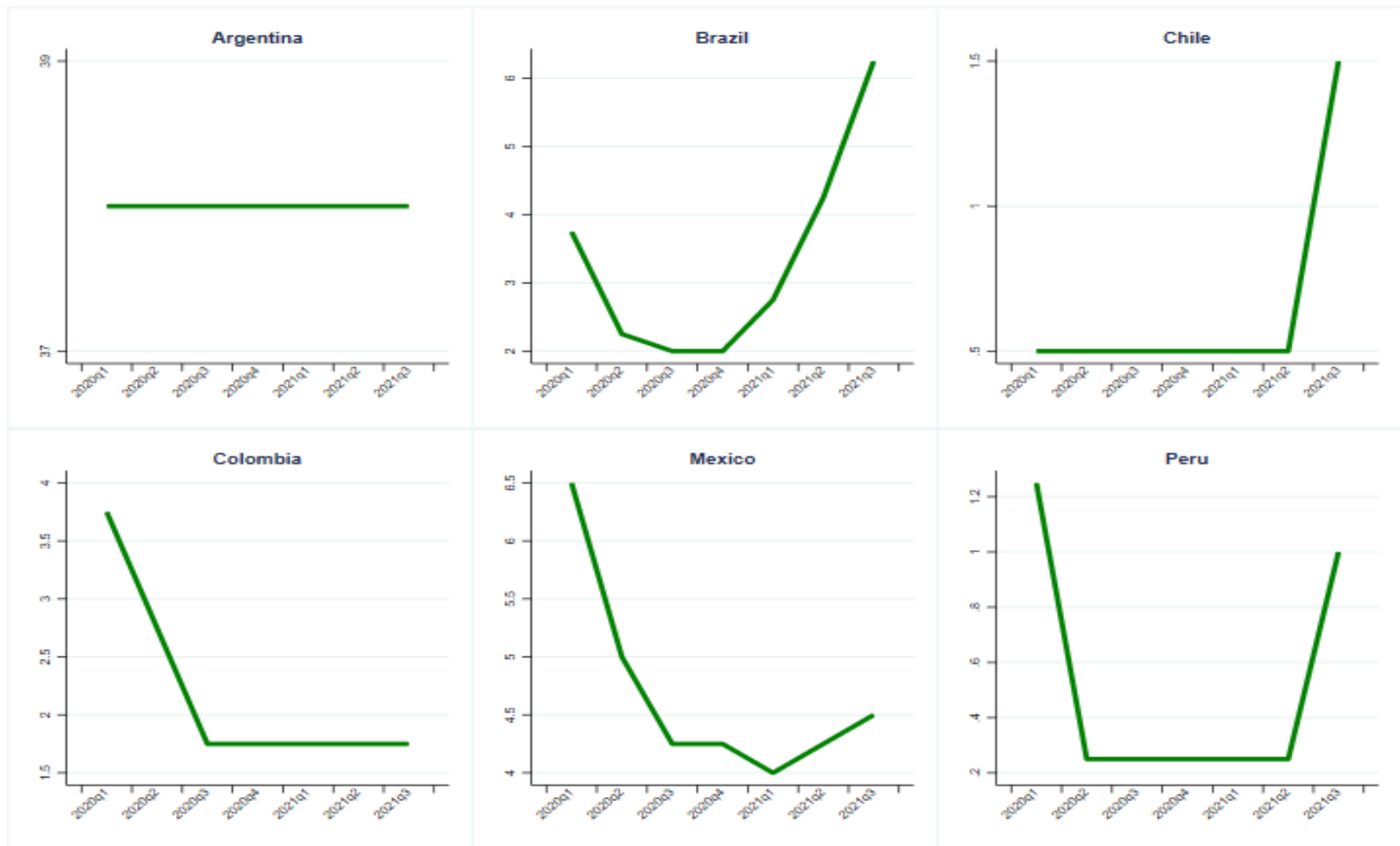
Figure F.3: Exports Growth in Emerging Asia and the Middle East



Source: Haver Analytics.

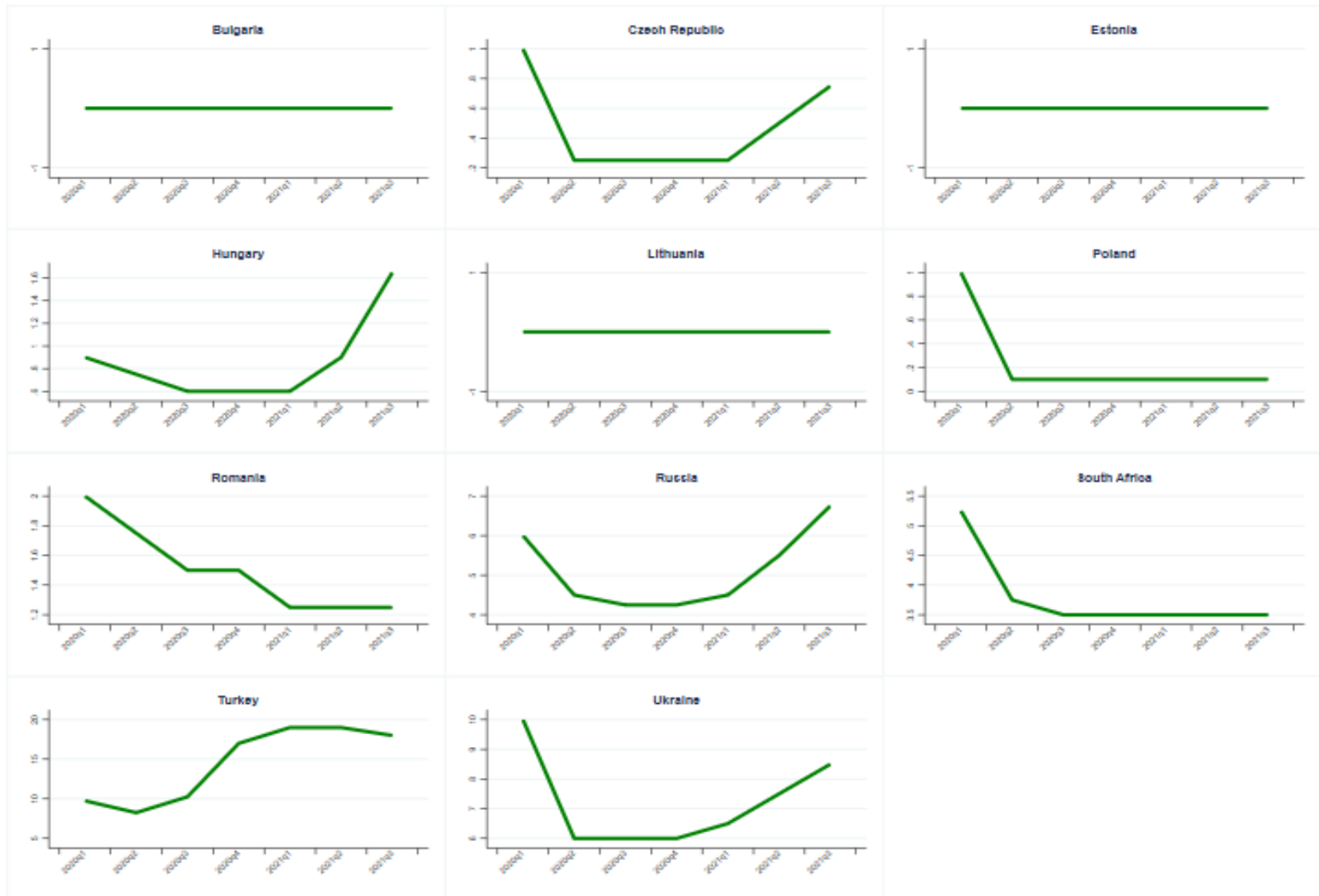
## G Appendix

Figure G.1: Monetary Policy Rates in Emerging Europe



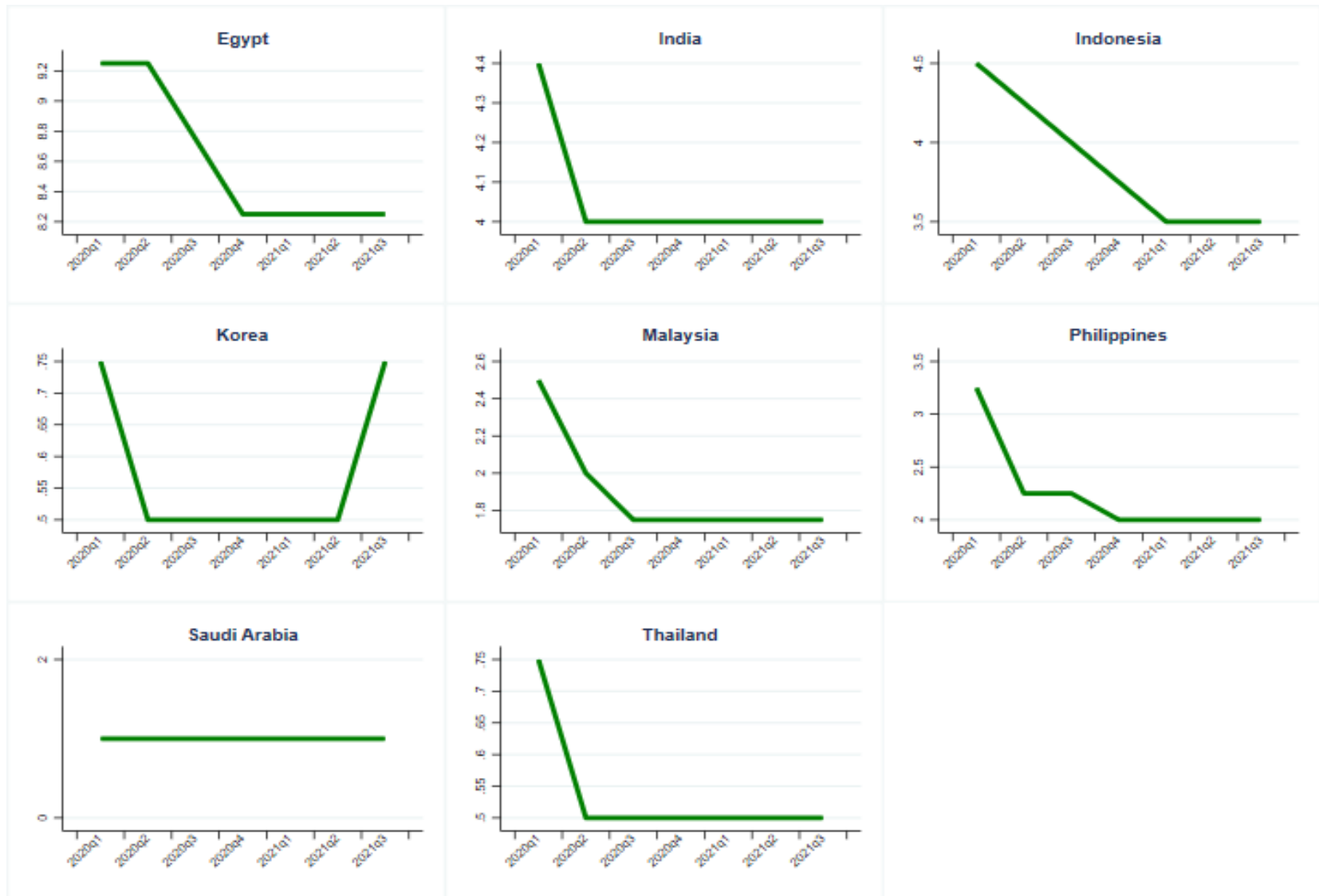
Source: Haver Analytics.

Figure G.2: Monetary Policy Rates in Emerging Europe



Source: Haver Analytics.

Figure G.3: Monetary Policy Rates in Emerging Asia and the Middle East



Source: Haver Analytics.

## H Appendix

Table H1: Test of Serial Correlation for GDP

	Statistic	p-value
Bias-corrected Q(p)-test <sup>a</sup>	1.408	0.496
Heteroskedasticity-robust HR-test <sup>a</sup>	0.173	0.867
Wooldridge (2002) <sup>b</sup>	0.972	0.334

<sup>a</sup> See Born and Breitung (2016).

<sup>b</sup> See Wooldridge (2010)

Under the null, there is no serial correlation

Table H2: Test of Cross-Section Dependence for Unemployment

	Statistic	p-value
Pesaran (2021) CD test	-1.392	0.163

Under the null, there is cross-section independence

Table H3: Test of Serial Correlation for Unemployment

	Statistic	p-value
Bias-corrected Q(p)-test <sup>a</sup>	1.852	0.396
Heteroskedasticity-robust HR-test <sup>a</sup>	1.293	0.197
Wooldridge (2002) <sup>b</sup>	542.781	0.000

<sup>a</sup> See Born and Breitung (2016).

<sup>b</sup> See Wooldridge (2010)

Under the null, there is no serial correlation

Table H4: Test of Cross-Section Dependence for Unemployment

	Statistic	p-value
Pesaran (2021) CD test	7.504	0.093

Under the null, there is cross-section independence



Table H5: Test of Serial Correlation for Exports

	Statistic	p-value
Bias-corrected Q(p)-test <sup>a</sup>	18.94	0.000
Heteroskedasticity-robust HR-test <sup>a</sup>	0.588	0.559
Wooldridge (2002) <sup>b</sup>	49.43	0.000

<sup>a</sup> See Born and Breitung (2016).

<sup>b</sup> See Wooldridge (2010)

Under the null, there is no serial correlation

Table H6: Test of Cross-Section Dependence for Exports

	Statistic	p-value
Pesaran (2021) CD test	15.369	0.000

Under the null, there is cross-section independence

# I Appendix

Table I1: 2SLS Panel Regression for Quarterly GDP Growth

	All Periods		2020		2021	
	(1) $\Delta$ GDP	(2) $\Delta$ GDP	(3) $\Delta$ GDP	(4) $\Delta$ GDP	(5) $\Delta$ GDP	(6) $\Delta$ GDP
Lagged $\Delta$ GDP	−0.174* (0.055)	−0.0990* (0.051)	−0.220** (0.030)	−0.0680 (0.251)	−0.476*** (0.007)	−0.375* (0.050)
$\Delta$ Deaths	−0.0240** (0.044)	−0.0105 (0.530)	−0.0733** (0.039)	−0.0447 (0.137)	0.00794 (0.614)	0.0210 (0.340)
$\Delta$ Stringency Index (OSI)	−0.109* (0.075)	−0.217*** (0.000)	−0.129* (0.085)	−0.239*** (0.002)	−0.101 (0.402)	−0.0202 (0.871)
$\Delta$ Exports	0.202** (0.010)	0.291*** (0.000)	0.229** (0.035)	0.308*** (0.009)	0.178* (0.090)	0.231** (0.018)
$\Delta$ Policy Rate	−0.168 (0.296)	−0.280 (0.151)	−0.249 (0.310)	−0.249 (0.206)	2.971** (0.021)	2.349 (0.143)
Fiscal Support	0.0333 (0.190)	0.00372 (0.905)	0.0531 (0.195)	0.00667 (0.860)	0.0467 (0.297)	0.0365 (0.452)
Deaths $\times$ GDP per capita	0.000742 (0.975)	0.000671 (0.983)	0.00745 (0.936)	−0.0412 (0.663)	−0.0359 (0.299)	−0.0941* (0.067)
OSI $\times$ GDP per capita	0.104 (0.101)	0.122* (0.074)	0.109 (0.118)	0.126* (0.095)	0.120 (0.357)	0.187 (0.223)
2020:Q2	−9.333*** (0.001)		−8.860** (0.023)			
2020:Q3	4.829 (0.124)		3.064 (0.310)			
2020:Q4	5.619*** (0.000)		5.561*** (0.008)			
2020:Q1	3.696** (0.018)					
2020:Q2	−0.314 (0.875)				−4.153*** (0.006)	
2020:Q3	0.927 (0.563)				−4.450** (0.037)	
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	No	Yes	No	Yes	No
R-squared	0.806	0.745	0.872	0.851	0.463	0.281
Adjusted R-squared	0.788	0.733	0.856	0.837	0.374	0.189
Observations	172	172	100	100	72	72
Groups	25	25	25	25	25	25

p-values from country-based cluster robust standard errors in parenthesis

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table I2: 2SLS Panel Regression for Quarterly GDP Growth

	All Periods		2020		2021	
	(1) $\Delta$ GDP	(2) $\Delta$ GDP	(3) $\Delta$ GDP	(4) $\Delta$ GDP	(5) $\Delta$ GDP	(6) $\Delta$ GDP
Lagged $\Delta$ GDP	-0.174* (0.055)	-0.173* (0.053)	-0.220** (0.030)	-0.227** (0.027)	-0.476*** (0.007)	-0.492*** (0.008)
$\Delta$ Deaths	-0.0240** (0.044)	-0.0237** (0.048)	-0.0733** (0.039)	-0.0729** (0.041)	0.00794 (0.614)	0.00748 (0.628)
$\Delta$ Stringency Index (OSI)	-0.109* (0.075)	-0.108* (0.076)	-0.129* (0.085)	-0.128* (0.089)	-0.101 (0.402)	-0.103 (0.393)
$\Delta$ Exports	0.202** (0.010)	0.202** (0.010)	0.229** (0.035)	0.227** (0.039)	0.178* (0.090)	0.162 (0.130)
$\Delta$ Policy Rate	-0.168 (0.296)	-0.161 (0.322)	-0.249 (0.310)	-0.222 (0.379)	2.971** (0.021)	3.038** (0.019)
Fiscal Support	0.0333 (0.190)	0.0315 (0.255)	0.0531 (0.195)	0.0500 (0.239)	0.0467 (0.297)	0.0708 (0.265)
Deaths $\times$ GDP per capita	0.000742 (0.975)	0.000603 (0.979)	0.00745 (0.936)	0.0210 (0.828)	-0.0359 (0.299)	-0.0364 (0.341)
OSI $\times$ GDP per capita	0.104 (0.101)	0.106* (0.092)	0.109 (0.118)	0.113 (0.111)	0.120 (0.357)	0.118 (0.377)
ESI $\times$ GDP per capita		0.378 (0.721)		1.351 (0.337)		-2.585 (0.546)
R-squared	0.806	0.806	0.872	0.872	0.463	0.473
Adjusted R-squared	0.788	0.787	0.856	0.855	0.374	0.376
Observations	172	172	100	100	72	72
Groups	25	25	25	25	25	25

p-values from country-based cluster robust standard errors in parenthesis

Country and time fixed effects included but not reported

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table I3: 2SLS Panel Regression for Unemployment

	All Periods		2020		2021	
	(1) Unemployment Rate	(2) Unemployment Rate	(3) Unemployment Rate	(4) Unemployment Rate	(5) Unemployment Rate	(6) Unemployment Rate
Lagged unemp	0.798*** (0.000)	0.796*** (0.000)	0.512*** (0.003)	0.511*** (0.003)	0.498*** (0.000)	0.492*** (0.000)
$\Delta$ Deaths	0.0142* (0.072)	0.0140* (0.066)	-0.0125 (0.328)	-0.0115 (0.327)	0.0267** (0.023)	0.0267** (0.023)
$\Delta$ Stringency Index (OSI)	0.00872 (0.172)	0.0103 (0.108)	-0.00725 (0.280)	-0.00551 (0.416)	0.0150 (0.280)	0.0149 (0.276)
$\Delta$ Exports-Mach	-0.00434* (0.099)	-0.00425* (0.098)	-0.00878** (0.027)	-0.00858** (0.024)	0.000342 (0.852)	0.000268 (0.883)
$\Delta$ Fiscal Support	0.00809* (0.083)	0.00724 (0.121)	0.00590 (0.388)	0.00555 (0.411)	-0.00165 (0.636)	-0.00326 (0.459)
$\Delta$ policy rate	-0.0730 (0.431)	-0.0750 (0.430)	0.0574 (0.321)	0.0584 (0.318)	-0.113 (0.361)	-0.0931 (0.433)
Deaths $\times$ GDP per capita	-0.00988 (0.155)	-0.00936 (0.339)	0.00457 (0.666)	0.00531 (0.578)	-0.0204 (0.417)	-0.0207 (0.518)
OSI $\times$ GDP per capita	0.00692* (0.053)	0.00347 (0.372)	0.0122** (0.025)	0.00817 (0.155)	0.0167*** (0.000)	0.0164*** (0.000)
ESI $\times$ GDP per capita		0.00498* (0.077)		0.00477 (0.141)		0.00401 (0.212)
Within R-squared	0.5286	0.5292	0.3420	0.3430	0.4144	0.4173
Observations	566	566	268	268	225	225
Groups	25	25	25	25	25	25

p-values from Driscoll-Kraay standard errors in parenthesis

Country and time fixed effects included but not reported

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table I4: 2SLS Panel Regression for Export Growth

	All Periods		2020		2021	
	(1) $\Delta$ Exports	(2) $\Delta$ Exports	(3) $\Delta$ Exports	(4) $\Delta$ Exports	(5) $\Delta$ Exports	(6) $\Delta$ Exports
Lagged $\Delta$ Exports	−0.134* (0.062)	−0.134* (0.063)	−0.115 (0.116)	−0.114 (0.120)	−0.457*** (0.002)	−0.457*** (0.002)
$\Delta$ Deaths	0.115 (0.123)	0.115 (0.121)	0.0323 (0.860)	0.0255 (0.895)	−0.0809* (0.079)	−0.0809* (0.077)
$\Delta$ Stringency Index (OSI)	−0.373*** (0.001)	−0.374*** (0.002)	−0.446*** (0.002)	−0.462*** (0.003)	−0.0817** (0.015)	−0.0818** (0.015)
$\Delta$ Fiscal Support	−0.0786* (0.062)	−0.0781* (0.052)	−0.105 (0.102)	−0.101 (0.126)	−0.0120 (0.827)	−0.0124 (0.821)
$\Delta$ policy rate	0.785 (0.190)	0.786 (0.191)	0.377 (0.588)	0.374 (0.593)	2.718 (0.212)	2.724 (0.207)
Deaths $\times$ GDP per capita	0.0345 (0.646)	0.0342 (0.643)	0.123 (0.317)	0.114 (0.364)	0.0176 (0.583)	0.0176 (0.587)
OSI $\times$ GDP per capita	0.0197 (0.673)	0.0218 (0.531)	−0.00910 (0.906)	0.0344 (0.558)	0.127** (0.012)	0.127 (0.212)
ESI $\times$ GDP per capita		−0.00297 (0.923)		−0.0514 (0.480)		0.00113 (0.928)
Within R-squared	0.2567	0.2567	0.3491	0.3507	0.2692	0.2692
Observations	598	598	286	286	234	234
Groups	26	26	26	26	26	

p-values from Driscoll-Kraay standard errors in parenthesis

Country and time fixed effects included but not reported

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$