

Economic Crisis in Mexico and Central America

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Abstract

This paper analyzes the characteristics of economic crises in Mexico and Central America, emphasizing their causes and persistence. The results indicate that the crisis defined as the contraction to negative values of economic growth rates in the countries under analysis are not persistent, but the crises originated by the contraction of the US growth rate are persistent. The analysis also addresses the effects of the crises on other variables, finding that they have an impact on the increase in unemployment, remittances, the underground economy, violence, and the fall in productivity. In other words, the original crisis gives rise to the emergence of other crises, which are the ones that explain the economic cycle. The implication is that economic recovery after the crisis, and the shielding of the economy from being affected by crises, requires investments in social development and governance, as well as the protection of the productive sectors. In turn, these investments determine the business cycle. The paper concludes with a series of considerations on appropriate policies to shield economies from external shocks and to achieve early recovery.

Keywords: economic contraction, social policy, human capital, remittances, governance

JEL classification: E02, E6, F24, F44, I25.

1. Introduction

In recent years, a growing literature has studied the repercussions of banking and exchange crises on the subsequent economic recovery of the respective country. A position that has resulted from this literature is that economic recovery as such does not exist, but rather that after a crisis the economy acquires a new trend of economic growth, lower than the previous one, and does not recover its old trajectory.

This analysis has clear implications for social development; on the one hand, the slow economic growth after the crisis would lead to further increases in unemployment, which could lead to fueling irregular emigration and also violence, given the evidence that unemployment is one of the main triggers of the homicide rate (Chioda, 2017). Likewise, suicide rates could increase in the face of slow employment growth, since unemployment is an important determinant of suicide (Laanani et al., 2014; Gunnell et al., 1999; Berk, Dodd, & Henry, 2005).

The theme of the crisis and its subsequent consequences is a topic of interest for Latin American countries, particularly for Central American countries, which after the external debt crisis of the 1980s have not achieved the high growth rates that prevailed in the 1960's and 1970's, when the import substitution model was in force. The growth of some Latin American countries showed dynamism in the period 2012-2016 due to the improvement in the terms of trade, but after this boom in primary goods, growth rates have been low.

In this work, the repercussions of economic crises are analyzed in a sample of panel data from the period 2000-2017 from Mexico, El Salvador, Guatemala, the Dominican Republic and Costa Rica. These countries, and the period of analysis, have been chosen due to the availability of data. The consequences of two types of crises are analyzed; one, defined as the fall in the GDP per capita growth rate of the countries under study to a negative rate and another, as the event when the growth rate of the US economy is negative.

Next, a brief review of selected literature on this topic is presented, which is followed by the presentation of the data and its statistical properties. This is followed by the estimation of Var models that allow us to appreciate the responses of certain variables to shocks from both types of crises. The next section analyzes the repercussions of the original crisis on other variables that, in turn, provide continuity to the recession, and equations are estimated to identify the variables that contribute to overcoming the crisis. The work ends with a series of conclusions.

2. Literature Review

Cerra and Saxena (2005) analyzed the experiences of economic growth and contraction of a sample of countries, to answer the question of whether economies return to their previous growth trajectory after experiencing a crisis. Their results showed that recessions tend to be followed by periods of slow growth, so their effects are persistent.

Cerra and Saxena (2011) analyzed the economic growth trajectories of 160 countries and found that in all regions and in all countries of different levels of per capita income, immediately after a recession, economies have low rates of economic growth. The authors also show that economies do not return to their old growth trajectory, but rather advance along a new trajectory, but do not reach the growth rates prior to the recession. Thus, the authors conclude that the economic cycle does not exist.

Eo and Morley (2022) studied the slow economic recovery of the US after the 2008-2009 recession, by applying the Markov chain shift methodology, concluding that the recession had led to a negative GDP gap, from which the economy began to recover with a lower economic growth trend than that existing prior to the crisis, which, they suggested, could be the result of the deterioration in productivity that had already been observed several years before the recession.

The slow recovery of the economy after a recession has been corroborated by other studies. Ascher and Wilcox (2015) reported that after the 2008 global crisis, several developed countries had not recovered the economic dynamism of the years prior to the crisis. Blanchard, Cerruti, and Summers (2015) have shown that in two out of three crises the subsequent economic growth rates of the affected countries are lower than before the crisis.

Productivity losses resulting from recessions have been corroborated by Furceri et al. (2012) in terms of the reduction in research and development expenses by companies, and by Bernstein et al. (2019), as a result of the loss of knowledge, typical of companies that go bankrupt during the recession.

Reference must be made to the work of Fatas and Summers (2016), who addressed the persistent effects of the 2009 global crisis through regression analysis of the forecast errors of economic growth rates, projected by the International Monetary Fund, expressed in terms of the forecast error of 2009. The results showed that the coefficients of the forecast errors of 2012, 2015, and 2021 were positive and significant, indicating that the declines in actual growth rates were related to the original errors; the authors found that the subsequent decline in economic growth mirrored the magnitude of the decline experienced in 2009.

Suphaphiphat and Shi (2022) analyzed, using data from 1971-2013, the effects of banking and health crises on the subsequent phases of employment and value-added growth of 10 sectors in 37 countries. The results showed that the falls in sectoral value added and employment were persistent and differed between sectors. The steepest declines in value added in the face of a banking crisis were in the construction, financial services, and transportation sectors, while declines in employment in the face of health crises were most severe in industries dominated by new companies, and in "start ups" (Note 1).

Reference must be made to the work of Kim et al. (2022) on the repercussions on the economic growth of extreme climate events that affect Central American countries. The authors estimated Var models with the growth of the economic activity index, remittances, and the bilateral exchange rate with the US and a qualitative variable that represented the event of an extreme natural disaster. The estimation of the responses of economic growth to climate crisis events revealed that the economic activity index fell by one percentage point in the cases of El Salvador and the Dominican Republic, while the falls in economic activity in Honduras and Nicaragua were of 0.75 percentage points. They also reported that these falls were permanent.

In this work, a sample of panel data from the period 2000-2019, from Mexico, Guatemala, El Salvador, Costa Rica and the Dominican Republic, is used to analyze the effects of two types of crises: one, *Cualicrisisdos*, which represents the years when the economies of the countries included in the sample experienced a contraction in the growth of their GDP per capita, and another, *Cualicrisisexterna*, which represents the years when the US economy has negative rates of economic growth. In both cases, crises are represented by qualitative variables that have a value of unity when a recession occurs, either in the country in question or in the United States, and zero in other years.

In the first estimation, the most exogenous variable of the Var is *Cualicrisisdos*, the qualitative variable that denotes the event of a crisis in the corresponding country, followed by remittances as a percentage of GDP and the economic growth rate; next, the male and female youth unemployment rates enter the Var and, as the most endogenous variables, the male and female suicide rates enter. The Var is as follows: (*Cualicrisisdos*, remittances, growth, male unemployment, female unemployment, male suicide, female suicide).

To control for fixed effects, the Var includes qualitative variables that denote the countries except Mexico. The Var was estimated with lags of three years, according to the Akaike criterion.

3. Data

The source of all data is the World Development Indicators, from the World Bank. The average values and standard deviations of the variables are shown in Table 1.

Table 1. Average values and standard deviations of the variables, 2000-2018

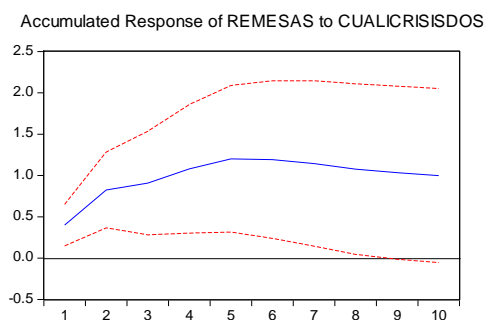
Variables	Average	Standard deviation
Remittances	7.9786	6.4007
Growth	3.3332	2.3113
Female youth unemployment	13.5712	6.9533
Masc youth unemployment	9.4008	4.2806
Female suicide	2.3267	0.7358
Masc suicide	9.3267	0.7358
Control of corruption	-0.3965	0.5290
Government capacity	-0.2882	0.4312
Manufacturing	16.5531	2.1761
Homicides	28.3884	20.8226
Shadow	5.2763	10.3078
Rate	6.7500	3.4390
Money	45.3552	10.3078
Credit	31.1264	12.7174
Student/teacher	26.6816	7.3426
Salaryemploy female	61.3467	11.7514
Salary employ masc	61.1665	3.6789
Self employment female	38.6546	11.7359
Self employment masc	38.8758	8.6697
Youth employment/pop. female	28.0000	3.3309
Youth employment/pop. masc	28.3610	4.2654

4. Results

It can be seen in Figure 1 that remittances increase in response to Cualicrisisdos, which is explained by the willingness of emigrants to provide financial assistance to their relatives in the corresponding country by sending remittances. This response is persistent, indicating that as a result of the crisis, remittances subsequently maintain their new and higher level.

The response of the economic growth rate is negative, as expected, but it is only significant in the first three years of the period, which means that the impact of the crisis in maintaining the recessionary effects weakens after three years.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.



Accumulated Response of GROWTH to CUALICRISIDOS

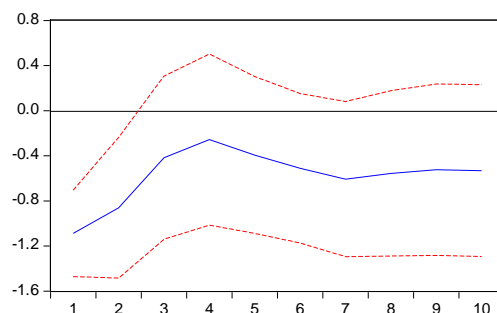


Figure 1. Responses of remittances and economic growth

It is observed in Figure 2 that the response of the male youth unemployment rate is positive and significant in the first part of the period, that is, after the crisis male youth unemployment reaches a higher level.

This is not the case for female youth unemployment, whose response is persistently positive throughout the period, that is, young women do not recover the levels of their unemployment levels existing before the crisis, on the contrary, their unemployment rate suffers a permanent increase.

It could be that the increase in youth unemployment is not persistent due to the fact that after the crisis young men have easier access to jobs than young women.

This has implications in terms of economic growth, given the evidence that female labor participation is an important determinant of economic growth (Ostry, Alvarez, Espinoza, & Papageorgiou, 2018). Female youth unemployment sets into operation a negative feedback loop that would deepen the original recession.

In other words, the deterioration of employment, particularly for women, could generate obstacles to economic growth due to supply restrictions. Furthermore, it is feasible that, in the face of persistent unemployment, young women desist from seeking employment and abandon the labor market and enter informality, which could undermine productivity, thus deepening recessionary trends in the recovery period. This would be another negative feedback loop. The implication is that the responses of female and male youth unemployment contribute to shaping the business cycle.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Accumulated Response of DESEMPLEOJOVENMASC to CUALICRISISDOS Accumulated Response of DESEMPLEOJOVENFEME to CUALICRISISDOS

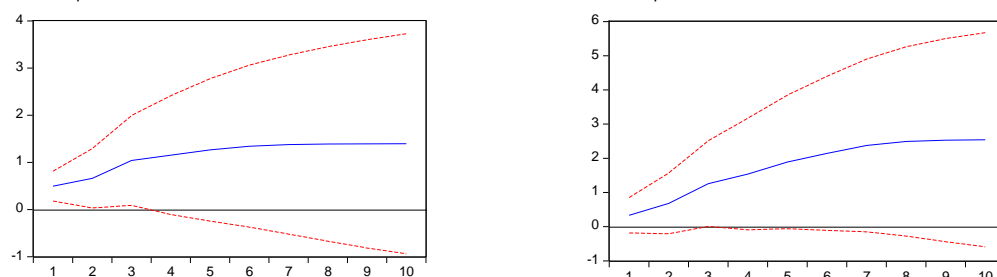
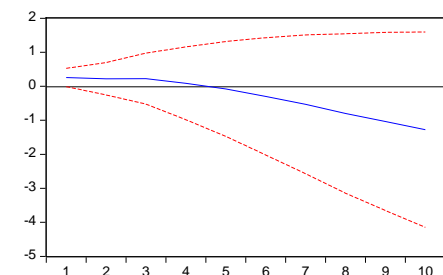


Figure 2. Responses to female and male youth unemployment rates

Figure 3 shows that the male suicide rate has a positive and significant response in the first three years of the period, contrary to the female suicide rate, which shows a negative and marginally significant response, that is, in the event of a national economic recession, women do not resort to suicide, since they recognize that in the face of a recession, they have to ensure the well-being of the home, especially given the increases in youth unemployment rates observed in Figure 2.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Accumulated Response of SUICIDIOMASC to CUALICRISISDOS



Accumulated Response of SUICIDIOFEME to CUALICRISISDOS

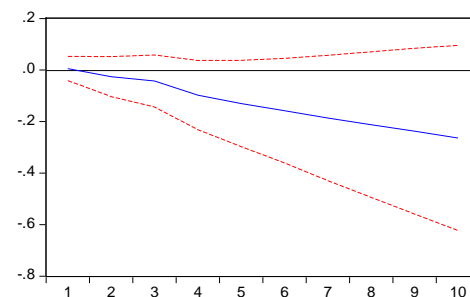


Figure 3. Responses of male and female suicide rates

Other Vars were estimated including variables that took the places of female and male suicide rates. It can be seen in Figure 4 that the size of the underground economy as a percentage of GDP increases due to the shock of the crisis (Note 2).

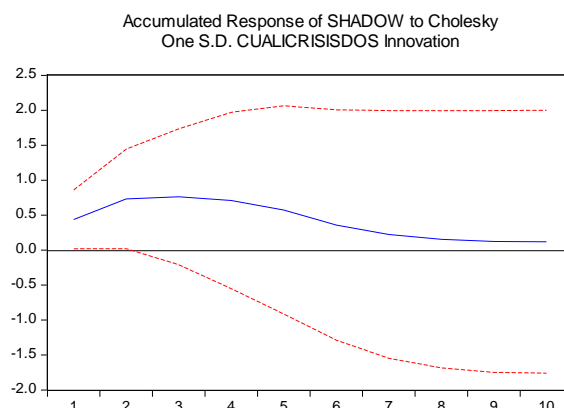


Figure 4. Response of the underground economy to economic crisis

It can be seen in Figure 5 that the government's capacity to design and execute policies is weakened in the face of the crisis, which would make economic recovery more difficult and make it more difficult to resume economic growth. The case could be that, faced with the multiple demands derived from the crisis, the capacity of the public sector is overwhelmed, and its response is less effective than in times prior to the crisis. It should be noted that the deterioration in government capacity is persistent, which could be a reflection of personnel layoffs carried out as austerity measures taken by governments in response to the recession.

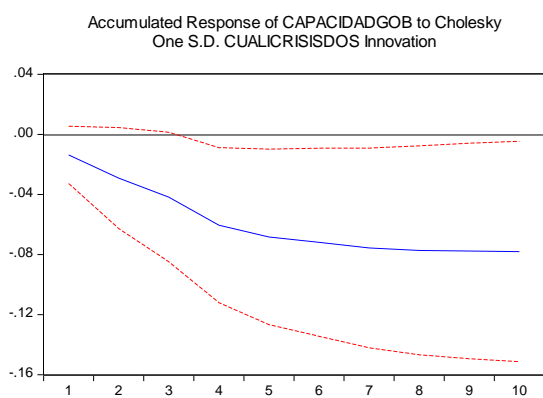


Figure 5. Government capacity response to a crisis

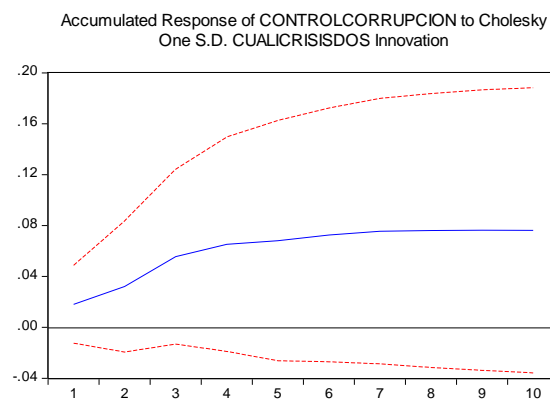


Figure 6. Response of control of corruption to an economic crisis

The response of control of corruption is positive and marginally significant in the period, which would contribute to overcoming the crisis (Figure 6).

4.1 Another Definition of a Crisis

Another Var was estimated which introduced the definition of an economic crisis as the qualitative variable that takes the value of unity in the years when the US growth rate is negative and zero in the other years.

The responses of remittances and the economic growth rate are shown in Figure 7.

It is observed that the response to remittances is not significant, which is related to the fact that in the event of an economic contraction in the US, emigrants residing in that country will not be in a position to make monetary remittances to their countries of origin, given the increase in unemployment.

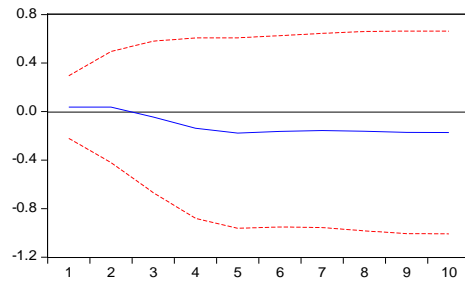
It should be noted that in this case, the drop in the economic growth rate is persistent. Given that countries export about half of their exports to the US (in the case of Mexico the percentage is higher), an economic recession in the US could mean the loss of importers whose recovery, as well as linking with new importers, could take time.

The economic recession in the United States implies a drop in demand for primary and maquila goods produced in Mexico and Central America, as well as a reduction in tourist trips to the Dominican Republic, which must be seen in the light of the results presented by several authors that demand crises are more persistent than supply crises. It is feasible to overcome a supply crisis through measures that are within the range of action of the national authorities, stimulating employment and production, for example, but the national authorities have no

impact on the demand problem in other countries.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Accumulated Response of REMESAS to CUALICRISISEXTERNA



Accumulated Response of GROWTH to CUALICRISISEXTERNA

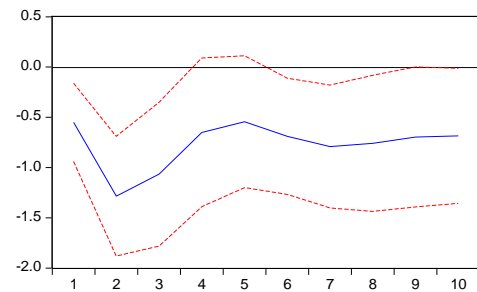
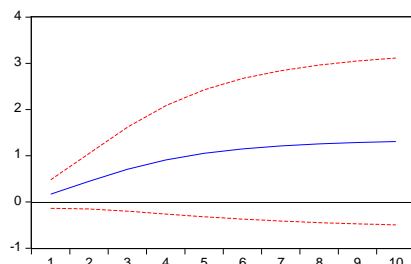


Figure 7. Response of remittances to growth crises in the United States

It is observed in Figure 8 that the male youth unemployment rate increases persistently and is marginally significant, which is contrary to the result shown in Figure 2, but the positive response of female unemployment is not significant. This could be explained by assuming that the male youth workforce works in sectors of tradable goods, while young women work in the sectors of commerce and other non-tradable services, which would be less affected by the recession in the United States.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Accumulated Response of DESEMPLEOJOVENMASC to CUALICRISISEXTERNA



Accumulated Response of DESEMPLEOJOVENFEME to CUALICRISISEXTERNA

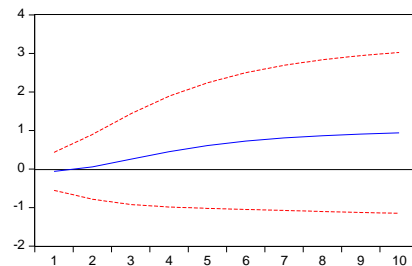


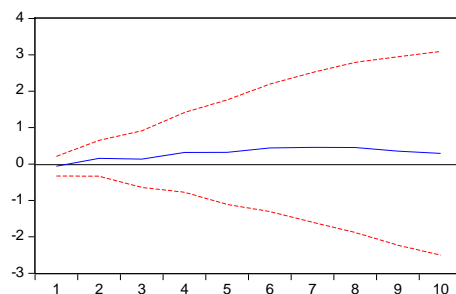
Figure 8. Responses of male and female youth unemployment rates

Of interest is the result that male and female suicide rates do not have significant responses to the economic recession in the US, as seen in Figure 9. This differs from the result shown in Figure 3 in which it was observed that the response for the female suicide rate was negative and marginally significant.

The explanation could be that the economic recession in the US could be perceived as a “distant” event that does not cause political or personal conflicts at the national level; likewise, the drop in remittances and economic growth could make young people see that they must redouble their efforts to contribute to the survival of the household.

Accumulated Response to Cholesky One S.D. Innovations ± 2 S.E.

Accumulated Response of SUICIDIOMASC to CUALICRISISEXTERNA



Accumulated Response of SUICIDIOFEME to CUALICRISISEXTERNA

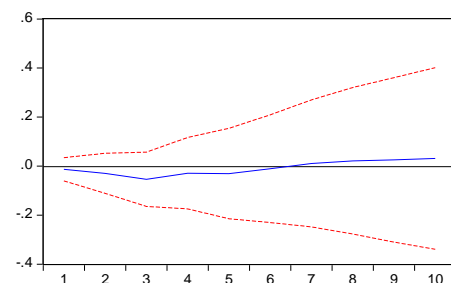


Figure 9. Responses of male and female suicide rates

4.2 Multiple Concurrent Crises

The above discussion shows that there are several negative circuits that impart persistence to the economic stagnation resulting from the original recession. The negative circuits that support the persistence of the recession are shown in Figure 10.

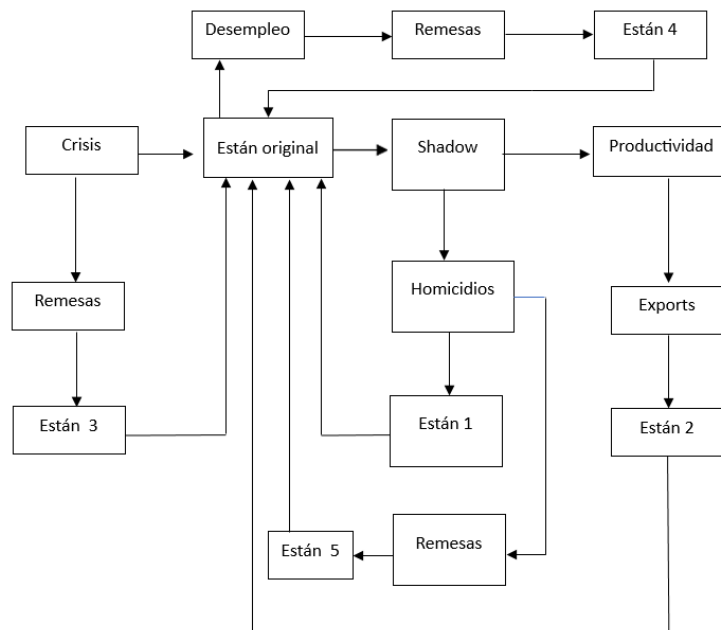


Figure 10. Circuits of crisis persistence

Originally, the economic recession, called Están original, generates an increase in the underground economy, Shadow, as seen in Figure 11. The response of the underground economy to the external crisis is positive and persistent, that is, the sustained contraction of the rate of economic growth imparts persistence to the underground economy.

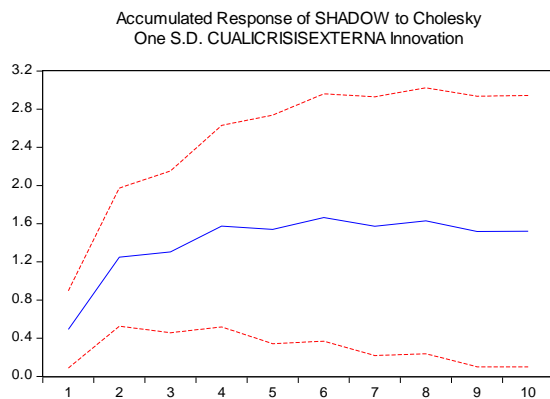


Figure 11. Shadow response to external crisis

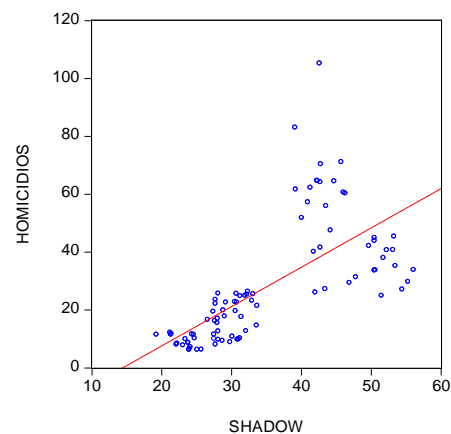


Figure 12. Underground economy and number of annual homicides per 100,000 inhabitants

One effect of Shadow is the increase in the homicide rate shown in Figure 12.

The increase in the homicide rate generates a negative circuit that leads to a drop in the economic growth rate (Figure 13).

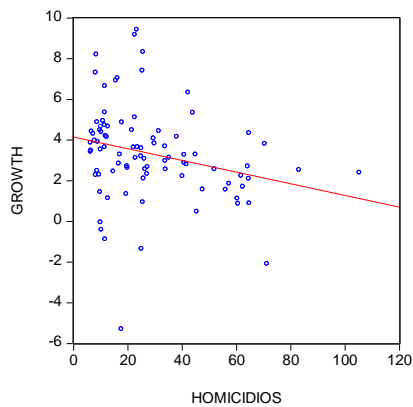


Figure 13. Homicide rates and economic growth

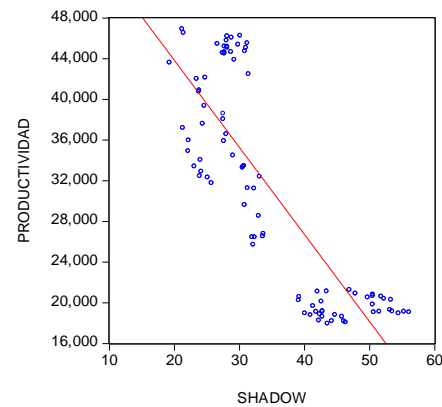


Figure 14. Underground economy and labor productivity

This additional recessive trend, Estan1, originated in the increase in homicides, adds to the original trend of economic recession, giving persistence to economic stagnation.

Another effect of Shadow is a reduction in labor productivity, which is shown in Figure 14. For its part, the decrease in productivity affects the reduction of the ratio of exports to GDP (Figure 15).

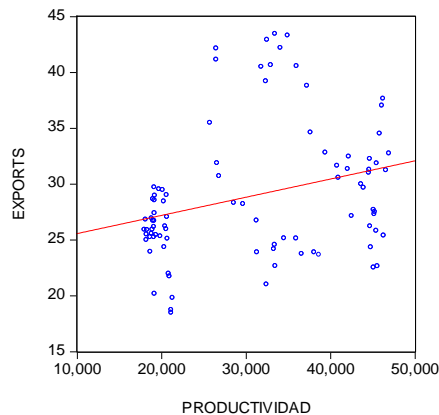


Figure 15. Labor productivity and ratio of exports to GDP

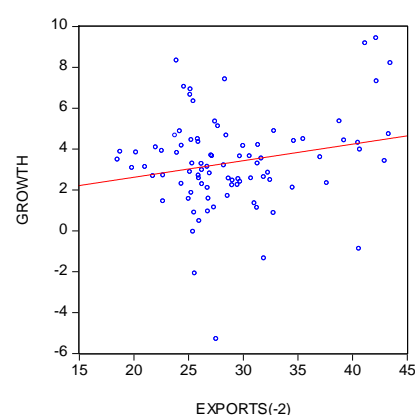


Figure 16. Exports and economic growth rate

Since there is a positive relationship between exports and economic growth, shown in Figure 16, the additional recessionary trend, Estan2, is added to the original decline in economic growth. This increases the tendency towards economic stagnation.

As was seen in Figure 1, the crisis gives rise to an increase in remittances, which have a negative impact on economic growth, as shown in Figure 17.

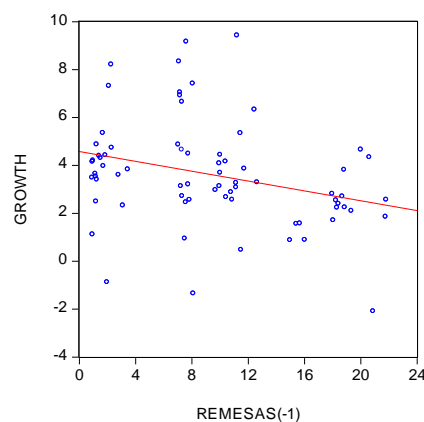


Figure 17. Remittances and economic growth

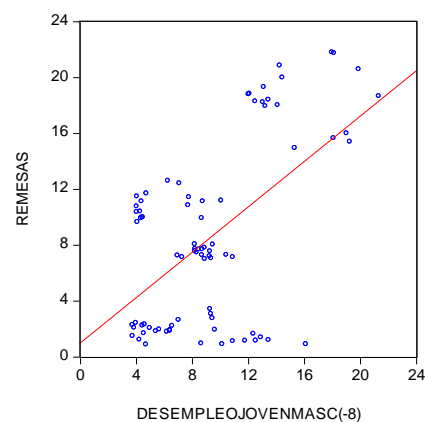


Figure 18. Male youth unemployment rate with 8 years of lag and remittances

That is, remittances generate an additional tendency towards stagnation, stan 3, which imparts persistence to the initial effect of the crisis on economic growth.

It must be kept in mind that the crisis led to increases in the unemployment rate, as seen in Figure 2; a consequence of the increase in unemployment is the increase in emigration, which is manifested by the increase in remittances received, with a lag of 8 years, see Figure 18.

The increase in remittances generates a new recessive trend, stan 4, which gives continuity to the original decline in economic growth.

It should be noted that the homicide rate generate migration outflows, which give rise to increases in remittances as a percentage of GDP, a relationship shown in Figure 19.

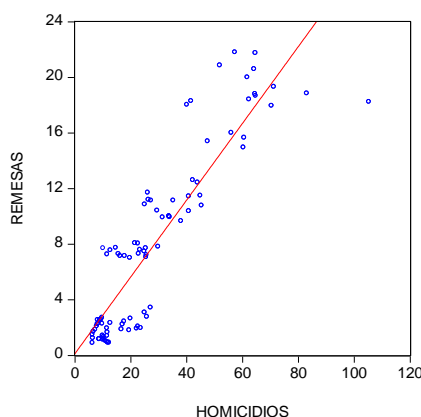


Figure 19. Homicide and remittance rate as a percentage of GDP

Remittances have another negative impact on economic growth, Estan 5, which makes recovery more difficult.

An implication of the circuits of recessive trends is that after the crisis, it would be difficult to discern what the cause of the crisis is since the original recession sets in motion a series of recessive trends that add to the original recession, thus giving persistence to the original recession and making economic recovery difficult.

It is this conjunction of recessive trends that determines the economic cycle, whose recovery will depend on overcoming the perverse effects of remittances, the underground economy, and violence, which can be of such intensity that recovery becomes elusive. .

To achieve recovery, the problem of unemployment would have to be faced first, through the design and implementation of emergency employment programs, as well as transfers to companies to support the payment of payrolls and thus avoid further deterioration of unemployment. An evaluation of this type of program by the International Monetary Fund showed that its effect had been to avoid increases in unemployment (Chun, Naido, & Sobrinho, 2022).

In the economies of Mexico and the Central American countries, different recessionary trends prevail simultaneously, some submerged and undetected, which represent a drag on economic growth and which, together, determine an economic trajectory characterized by a secular tendency towards stagnation. Over time, the sum of recessive trends, which originated in several cases in perverse economic policies, manifests itself in economic growth rates below historical rates, such as those of the sixties and seventies, as observed in Mexico and Central America.

4.3 The Special Case of the Dominican Republic

The Dominican Republic represents a true “ outlier ” in the region due to its high rate of economic growth in recent years, so it cannot be classified as an economy that suffers from secular stagnation.

To find an explanation, we would have to appreciate the trajectory of the productivity rate of this country, which is shown in Figure 20 together with that of Costa Rica.

It is observed that labor productivity has persistently increased year after year, except in 2002-2003 when a banking crisis occurred, and is closing the gap with the labor productivity values of Costa Rica, even though it does not have the same degree of human development.

The explanation lies in the fact that the main source of economic activity is tourism, which represented 15 million tourists annually in recent years. This activity has high productivity since it is a production function in

which the main inputs are free: the sea, the beach, the sun, the mountains, and the courtesy of the people are free of charge, in addition to the management of this sector by national authorities, which are widely recognized as efficient and diligent. Therefore, the production process shows high added value per worker, which translates into high rates of economic growth. This shows that tourism represents a particular way to boost productivity and economic growth.

It should be added that the ratio of tourism income to total exports is very high in the Dominican Republic, at 37.50 percent, higher than 18.79 percent in Costa Rica, 5.00 in Guatemala, 18.4 in El Salvador, and 4.96 percent in Mexico.

It is important to note that in 2018 the Dominican Republic had the highest import tariffs of the countries included in this study, twice the value of the tariffs of the other countries. Santos Paulino (2006) has presented evidence from the Dominican Republic that the tariff reduction was applied differentially according to the role of imports competing with national production; the tariff on the import of capital goods was reduced to zero, but that applied to consumer goods produced in the country was reduced from 35 to 20 percent, while that applied to inputs not produced in the country was reduced from 5 to 3 percent; that is, protection for the productive sector was maintained. In the 1990s after tariff reductions, the average tariff was 18.6 percent, four times the value of tariffs in Central American countries. Likewise, taxes were increased to compensate for the loss of tax revenue from imports.

This wisdom partly explains the high rates of economic growth.

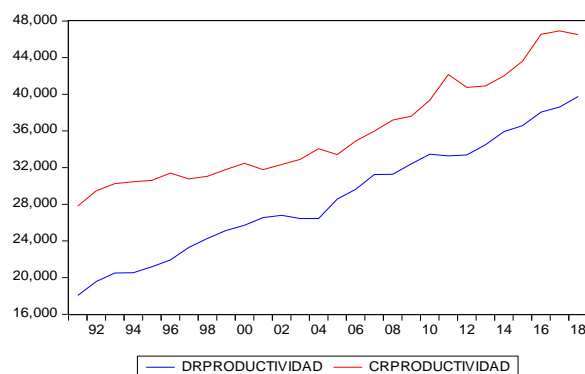


Figure 20. Labor productivity of the Dominican Republic and Costa Rica

4.4 Application of Principal Components

In the previous paragraphs it has been argued that recessions trigger responses from different variables that impart continuity to the original crisis. It is not an easy task to detect the variables that affect the persistence of the crisis and its particular effects. Next, it is proposed that the original crisis deepens or increases the size of the underground economy, the homicide rate, the female suicide rate, remittances, which represent emigration, and the female self-employment rate.

These variables were the subject of a principal components analysis, which is a methodology to compact variables into one or two variables that explain the variance of the original series. The results are the following:

Table 2. Principal components

Sample: 1 90					
Included observations: 90					
Computed using: Ordinary correlations					
Extracting 5 of 5 possible components					
Eigenvalues: (Sum = 5, Average = 1)					
number	value	Difference	Proportion	Cumulative value	Cumulative Proportion
1	3.815187	3.031613	0.7630	3.815187	0.7630
2	0.783574	0.524379	0.1567	4.598761	0.9198
3	0.259195	0.156240	0.0518	4.857956	0.9716
4	0.102955	0.063865	0.0206	4.960911	0.9922
5	0.039089	---	0.0078	5.000000	1.0000

Eigenvectors (loadings):					
Variable	PC 1	PC 2	PC 3	PC 4	PC 5
SHADOW	0.480787	-0.260490	-0.412606	0.029363	-0.727931
HOMICIDES	0.437598	0.510996	0.235415	-0.699209	-0.055476
SUICIDEFEME	0.403125	-0.560590	0.716195	0.078653	0.064083
REMITTANCES	0.430643	0.551485	0.107024	0.704237	0.054828
SELF-EMPLOYMENTFEME	0.478946	-0.229413	-0.499946	-0.090046	0.678178

It is observed that the first principal component explains 76.30 percent of the variance, while the second explains an additional 15.67 percent.

The first principal component is given by the expression:

$$CCPP1 = 0.4808\text{Shadow} + 0.4376\text{Homicides} + 0.4031\text{Female Suicide} + 0.4306\text{Remittances} + 0.4789\text{Self-employmentfeme}$$

The first principal component may be interpreted to represent the multiple and simultaneous recessionary trends existing in the economies.

A least squares equation was estimated expressing the first principal component in terms of the external crisis and the qualitative variables representing the fixed effects, with the following result:

$$CCPP1 = 38.5053 + 2.75\text{CualicrisisExternal} \\ (37.30) \quad (1.89)$$

$$R \text{ squared} = 0.96$$

It is observed that the coefficient of the variable that represents the external crisis is positive and significant.

The equation was re-estimated with the external crisis variable lagged one year with the following result:

$$CCPP1 = 38.4691 + 3.7919 \text{CualycrisisExternal}(-1) \\ (36.63) \quad (2.64)$$

$$R \text{ squared} = 0.96$$

In this case, the coefficient of the external crisis increases in value and statistical significance, that is, the effect of the economic contraction in the United States increases the national recessionary trends.

The implication is that crisis manifests itself in the linear combination of variables that are associated with the crisis event. This set of variables, in turn, acts to intensify the initial effects of the economic recession.

Another equation was estimated to determine the effect of the first principal component on the economic growth rate, with the following result:

$$\text{Growth} = -1.2688 - 0.0780\text{CCPP1} + 0.3828\text{Inversion} - 0.0360\text{Creditsprivate sector} \\ (0.37) \quad (1.53) \quad (2.44) \quad (0.99)$$

$$R \text{ squared} = 0.31$$

The coefficient of the first principal component, which represents the repercussions of the crisis, has a negative sign, as expected, which is significant at the 11 percent level. In other words, there is a series of variables that are triggered by the external crisis and that act in an underlying level, to further undermine economic growth. An implication is that the economic cycle depends on the variables that are affected by the initial external economic contraction.

It is observed that the equation explains one-third of the variance of the economic growth rate.

Figure 21 shows the negative relationship between the first principal component and the economic growth rate:

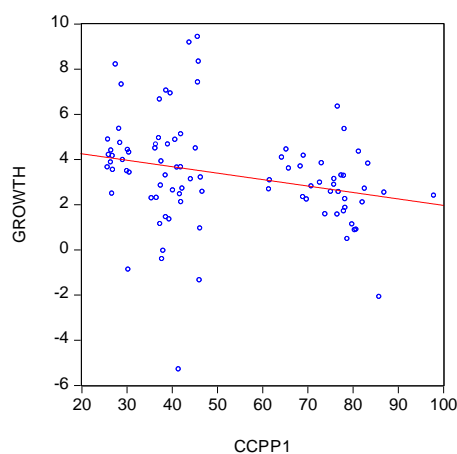


Figure 21. Value of the first principal component and economic growth rate

To continue the analysis of the relationship between the first principal component with the external crisis, the following Var was estimated: (Crisisexterna, CCPP1, Exports, Growth, private credit). The response of CCPP1 to the event of an external crisis is shown in Figure 22.

It is observed that the response of CCPP1 is positive and significant in the first half of the period, which can be interpreted as the existence of other crises, or several sub-crises, or new recessive trends, resulting from the original crisis.

However, Growth's response to CCPP1 is negative as expected, but is not significant, see Figure 23.

The previous analysis shows that the original recession “contaminates” other variables whose joint effect worsen the original recession. This indicates that efforts to overcome the recession must address a set of variables, such as informality, violence, unemployment, irregular emigration, and suicide, meaning that, in general terms, the fight against recessionary trends must resort to a substantial increase in social spending.

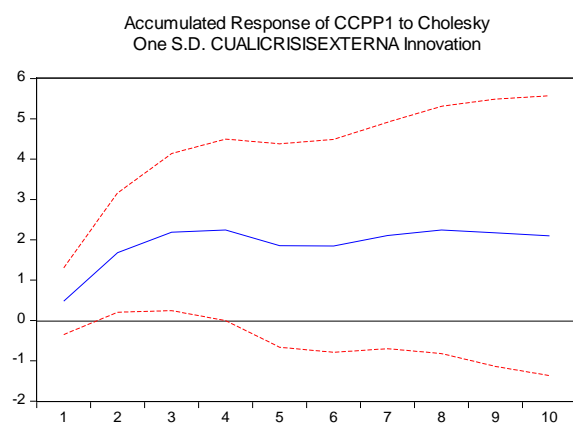


Figure 22. Response of CCPP1 to external crisis

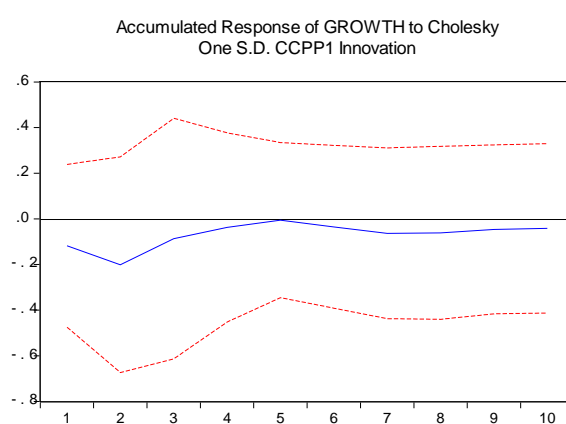


Figure 23. Growth response to CCPP1

To emphasize the argument that crises trigger perverse effects of variables that create additional tendencies toward economic stagnation, Appendix 1 shows the trajectories of the growth rates of the countries under study in the period 1991-2018.

It is observed in all countries that, in the immediate year after the crisis, the economies grow at high rates, but, subsequently, the growth rates tend to fall and remain low, so that they do not recover the growth trends prior to the crisis; this behavior is very marked in Costa Rica, Mexico, and Guatemala.

It is also observed in all countries that the slow economic growth after the 2009 crisis was more pronounced than the periods of slow growth experienced after other crises. Likewise, in each country, the economic “rebound” after each crisis is lower than the “rebound” of previous crises. This shows that contractions progressively

weaken the ability of countries to reverse trends towards stagnation. That is, the process of a secular tendency towards stagnation has a cumulative character.

4.5 Economic Policies Responses to Crises

It is valid to argue that there are means to reverse the impacts of the crises and return to, or surpass, the original path of economic growth.

In Figure 24, the economy is initially following path ABC, and at point B, it experiences a crisis that causes the economy to fall to point H. From that point on, the economy follows path HI, which shows that the loss of GDP, which is equal to BH is permanent, given that the economy does not return to its initial trajectory.

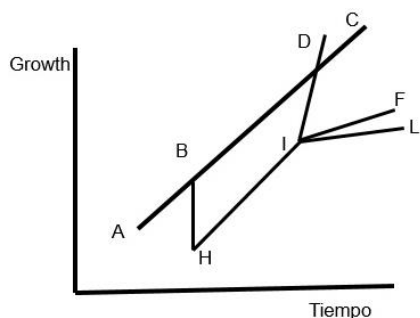


Figure 24. Economic policy responses to the recession

At point I, it may happen that national authorities implement austerity programs to solve the fiscal imbalance resulting from the loss of tax revenue as a result of the crisis. Then, given the resulting unemployment and fall in public investment, the economy would recover following the IF trajectory in which the loss of original GDP increases and the economy grows at a lower rate than in the two previous trajectories. It should be noted that Bianchi (2019) has shown that in a group of European countries, fiscal austerity reduces the diffusion of technologies, while giving rise to underinvestment in research and development, with negative consequences on productivity and economic growth in the medium and long term,

An even more perverse scenario can occur when the authorities implement a foreign trade reform by drastically reducing tariffs on imports as a measure of imparting “efficiency” to the national manufacturing industry. In this case, the resulting deindustrialization resulting from the displacement of national manufacturing (and agricultural) production by imports undermines the capacity for economic growth, and from point I the economy grows at an even lower rate than the original, following the trajectory IL

A different scenario occurs if the economic authorities put into force early childhood education programs, or quality education programs, in which case the economy recovers following the ID trajectory, which allows it to more than overcome the loss of GDP of BH and achieve growth rates higher than the original ones. This is a case where the recovery stage of the economic cycle exists by virtue of the implementation of appropriate social policies.

One implication is that crises can have a “homemade” nature, made at home through the implementation of perverse policies such as excessive economic openness, or fiscal austerity. The recessionary tendencies embedded in these policies give rise to other adverse repercussions on economic growth, such as unemployment, violence, and remittances, and thus recovery becomes more elusive.

After the reforms of the 1990s, Mexico and the Central American countries show trends towards stagnation and have not achieved the high rates of economic growth that they experienced in the 1960s and 1970s.

Not recognizing the perverse nature of the reforms can lead to making poor diagnoses of the situation of the economies, pointing out that the economic slowdown lies in the “fiscal deficit”, in the “absence of incentives”, or worse still, in an oversized public sector.

These diagnoses constitute a true “dead weight” which, like the effects of crises, are characterized by their persistence.

Economic recovery can be achieved through the implementation of policies that empower and protect all people. In other words, the economic cycle depends on social investment.

The best route to take is to “shield” the economy from perverse responses to external and internal crises,

implementing valuable programs, such as emergency employment programs, quality education, early childhood education, public health, employment protection, and the expansion of social security.

4.6 Estimation of Equations

Below, a series of equations are presented in Table 3, that express the economic growth rates in terms of the variable that represents the external crisis, Crisis, and others that have an impact on economic growth, which allows us to appreciate that there are variables to which that authorities can resort to to counteract the perverse repercussions of a crisis and thus prevent its persistence.

In all the estimated equations, the qualitative variable that represents the crisis has negative and significant coefficients.

Remittances show insignificant coefficients.

In equation 1, control of corruption has a positive and significant coefficient, which shows that the fight against corruption represents a means to accelerate economic growth and to reverse the effects of a crisis.

In equation 2, government capacity has a positive and significant coefficient at the 10 percent level, which implies that facing the crisis demands that governments have the capacity to structure and execute policies.

Equation 3 shows that the tariff on imports with a lag of one year has a positive and significant coefficient, which indicates that trade liberalization has made the crisis deeper and more persistent.

The percentage that the manufacturing sector represents in the GDP with two years of lag has a positive coefficient, which shows that reindustrialization would lead to reducing the effects of the crisis.

In equation 5, the dependent variable Manufacturing (-2) is multiplied by government capacity, which shows a positive and significant coefficient, indicating that government capacity enhances the role of the manufacturing sector in its contribution to economic growth.

Table 3. Crisis and other variables that affect the recovery of economic growth

	Ecuación número				
	1	2	3	4	(5)
Constant	3.8781 (10.44)	3.5112 (6.63)	2.4575 (2.80)	-0.3978 (0.19)	-0.0417 (0.03)
Crisis	-4.4143 (7.62)	-4.5488 (5.83)	-5.1065 (6.30)	-4.7859 (5.78)	-4.6835 (7.87)
Remittances	0.0227 (0.81)	0.0353 (0.65)	0.0128 (0.28)	-2.2656 (0.63)	0.0257 (0.80)
Control corruption	1.9671 (5.05)				
Government Capacity		1.2507 (1.62)			
Tarif(-1)			0.1535 (1.93)		
Manufacture(-2)				0.2497 (2.93)	
Manufacture(-2)x Goberment capacity					0.1098 (5.13)
R squared	0.52	0.41	0.40	0.39	0.52

Table 4 presents results for labor market variables. It is observed in equation 1 that the ratio of female to male youth employment has a positive and significant coefficient, which highlights the benefits of promoting female employment as a means to combat and prevent the economic recession. This result contrasts with the reality that women, and particularly young women, are the first to be laid off in times of a recession, a situation that was very marked in 2020 and 2021 during the worst of the pandemic (ECLAC, 2021a, 2021b, 2021c; Bluedorn et al., 2021; World Bank, 2021).

In Latin American countries, where female participation is low, the adverse repercussions of crises may be longer.

The implication is that the economic cycle depends on female labor participation.

A positive and significant coefficient shows the ratio of female to male salaried employment (equation 2), a result that highlights the importance of quality female employment as a means to overcome a crisis.

On the contrary, equation 3 shows that the ratio of female to male self-employment has a negative and significant coefficient, which means that female informality contributes to the continuation of the crisis. This must be seen in light of the evidence that an economic recession leads to an increase in informal employment, particularly female employment (Caceres, 2017b), and that when economic growth recovers, men return to the official economy, but women experience difficulties leaving informality. This difficulty of women to rejoin the formal economy could be a cause of continuity of the crises.

It is observed in equation 4 that the student-to-teacher ratio at the primary level, which as has been pointed out is an indicator of the quality of education, has a negative and significant coefficient, which shows that the low quality of education that prevails in most Latin American countries is another cause of the persistence of their crises.

Table 4. Effects of labor variables on reversing a crisis

	Equation number			
	1	2	3	4
Constant	-8.1607 (0.31)	-0.0534 (0.05)	6.5108 (8.12)	6.0905 (4.69)
Crisis	-3.8137 (5.30)	-4.2280 (6.65)	-4.3078 (6.35)	-4.8250 (6.21)
Remittances	0.4301 (1.00)	0.0325 (0.85)	0.0541 (1.32)	0.0473 (0.94)
Empleopopjovenfeme/ Empleopopjovenmasc	21.2792 (3.43)			
Elpmoysalariofeme/ Empleosalariomasc		3.3361 (3.87)		
Selfempleofeme/Selfempleomasc			-3.2200 (3.86)	
Estudent/teacher				-0.0992 (1.96)
R squared	0.42	0.48	0.47	0.45

Table 5 shows the results of monetary sector variables, which were significant only when they entered the equation as composite variables with variables of the governance sector.

In equation 1, the money variable broadly defined as a percentage of GDP multiplied by government capacity has a positive and marginally significant coefficient. When the money variable is multiplied by the control of corruption, (equation 2), the coefficient is positive and very significant, which implies that the effectiveness of monetary expansion can be nullified by the prevalence of high levels of corruption in the respective country, which would accentuate the crisis.

Similar results are observed in equations 3 and 4 in which the credit variable has been multiplied by the governance indicators. This shows the importance of governance in resolving a crisis.

Table 5. Role of the monetary sector in reverting the crisis

	Equation Number			
	1	2	3	4
Constant	3.4521 (6.52)	3.5708 (9.34)	3.1618 (6.24)	3.3972 (9.46)
Crisis	-4.4011 (5.75)	-4.3658 (1.97)	-4.4013 (6.14)	-4.4661 (8.15)

Remmitances	0.0529 (0.89)	0.0764 ()	0.1072 (1.82)	0.1051 (2.78)
MoneyxCapacidadgobierno	0.0307 (1.69)			
MoneyxControlcorrupcion		0.0504 (4.92)		
CreditxCapacidadgob			0.0671 (2.77)	
CreditxControlcorrupcion				0.0705 (5.71)
R squared	0.41	0.51	0.41	0.41

4.7 Comments on the Estimated Equations

It was observed in table 4 that the number of students per teacher, which is a variable associated with the quality of education, imparts negative effects on the rate of economic growth. It is worth mentioning the evidence presented by Hanushek and Woessmann (2009) that the quality of education is the main determinant of economic growth in Latin American countries.

A study of the scores obtained by third and sixth grade students in regional tests of educational quality (Note 3) showed that these scores had a positive relationship with the rate of economic growth and that, in addition, they increased with public spending on education; thus, education expenditure is a determinant of the economic dynamism of the countries in the region (Caceres, 2018).

This can be seen in Figure 25 constructed with data from 2013 for spending on education and from 2012-2015 for average annual economic growth rates, that the increase in public spending on education is associated with increases in economic growth rates.

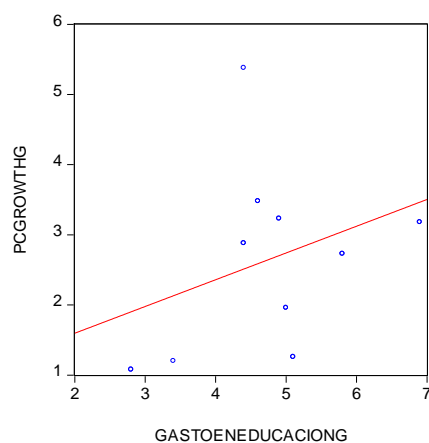


Figure 25. Expenditure on education as a percentage of GDP and economic growth per capita

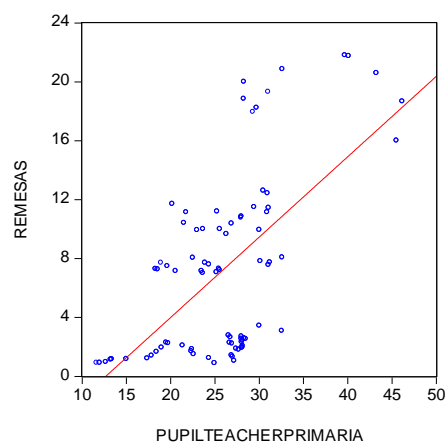


Figure 26. Ratio of students to teachers in primary school and remittances

The deduction that must be made is that the response to a crisis, as well as its prevention, lies in substantial increases in social spending, particularly in education and health.

It should be added that increasing education spending would lead to an increase in its quality and, consequently, a reduction in the school dropout rate, which would increase the number of students receiving their diplomas and thus the rate of homicides would fall (Note 4). Likewise, Caceres (2018) has presented evidence for Latin American countries that the number of incarcerated people falls with increases in the quality of education.

It should be added that the quality of education also plays a role in reducing irregular emigration; Figure 26 shows that as the number of primary students per teacher increases, remittances increase as a percentage of GDP; that is, low-quality education drives people out.

The number of students per teacher falls with the increase in public spending on education; therefore, increasing spending on education is another measure that can sustain dynamic growth after an economic crisis.

On the other hand, it was observed in Table 4 that the increase in the ratios of salaried female to male employment and of the ratios of female youth employment to population to male youth employment to population give rise to increases in the rate of economic growth.

It should be mentioned that a policy of special value lies in increasing governance, particularly the control of corruption and the capacity of governments to design and execute policies. It is observed in Figures 27 and 28 that Shadow decreases with increases in control of corruption and government capacity.

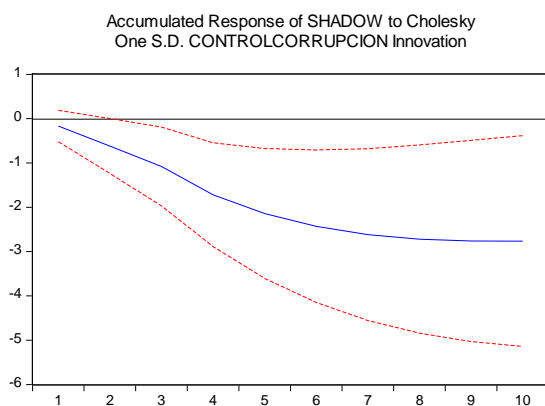


Figure 27. Response of the size of the underground economy to the increase in corruption control

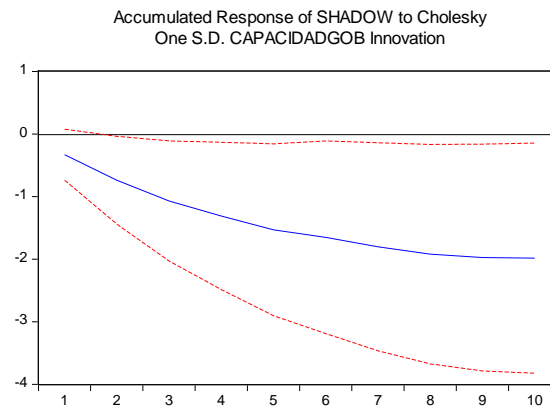


Figure 28. Government capacity and dimension of the underground economy

5. Conclusions

The results indicate that the economic contractions in Mexico and Central American countries lead to an increase in remittances, youth unemployment, and the homicide rate. The economic contraction is persistent only in the first years of the period.

When the crisis is defined as an economic recession event in the US, it was observed that remittances do not have significant responses, the male youth unemployment rate increases and the female suicide rate decreases. The response of the economic growth rate is negative and persistent.

With these results, it is argued that the original recession gives rise to responses of other variables that exert other recessive effects, such as the underground economy, youth unemployment, the homicide rate, and female suicide, so that the national economy enters a secular stagnation trap, originated in the swarm of recessive trends generated by several variables in response to the original crisis.

Likewise, increasing the quality of education plays an important role in reducing informality, the homicide rate and youth unemployment.

Several equations were estimated expressing the economic growth rate in terms of the qualitative variable that represented the external crisis, and other variables that were considered to have the potential to reverse the recession. Thus, the variables that can contribute to dismantling the negative circuits that kept economies under tendencies toward stagnation were identified and it was found that governability, particularly the control of corruption and the effectiveness of the government in designing and executing economic and social policies, have great value in reducing informality. From the estimates of these equations, it was also found that the quality of education, female employment, and the increase in import tariffs had significant coefficients, which revealed their potential role in counteracting the effects of a recession and thus avoid the secular tendency towards stagnation.

Particular importance lies in eliminating the extreme openness of economies, which has served no purpose except to generate large deficits in the trade account; therefore, recovering economic growth requires protecting manufacturing and agricultural productions.

The measures necessary to overcome the tendencies towards stagnation require substantially increasing tax revenues, which indicates the convenience of establishing national fiscal pacts with a view to decisively addressing social gaps, which would build a protection shield for national economies against external crises.

In relation to the variables that would contribute to overcoming the tendencies towards stagnation, it should be noted that the countries' governance indicators have extremely low values, in most countries they are negative,

so increasing them so that they reach positive values and thus contribute to economic growth will take many years. In the same sense, the ratios of female to male employment show trends of falling since after the global crisis of 2009. The best option to reverse the crisis would be substantial support for the quality of education. It is of particular value that countries reach regional commitments to substantially increase public spending on education to a level of 7 percentage points of GDP. A regional commitment would also be advisable to reduce the ratio of students to teachers at the primary level to a value of 15 or less.

The role of Central American economic integration in the reversal of secular trends towards stagnation is pending investigation. Caceres (2017a) has shown that trade flows between Central American countries, which are mainly composed of manufactured goods, have an effective role in reversing deindustrialization, while Caceres (2021) has shown that these flows exert positive impacts on labor productivity. Therefore, economic integration is another channel of economic policy to prevent and combat crises.

In the same sense, the results of this work indicate the convenience of creating reserves of public resources in Mexico and the Central American countries to meet the public spending and investment needs necessary to execute these programs, particularly those for employment protection in the events of external crisis. For the same purposes, it is necessary to put into effect fiscal pacts that lead to substantially increasing tax revenues. ECLAC (2019) has indicated that in Latin America large companies pay only 4 percent of their net income as income tax.

In view of the importance of the quality of education in promoting governability and economic growth, it is advisable that the countries of the region, with the support of international cooperation, develop efforts within the framework of a regional pact for achieving high levels of quality of education.

It should be noted that underlying recessive trends in economies can gain more strength and create new negative feedback loops which can make economic dynamism become increasingly elusive.

In the context, a secular tendency toward stagnation has the danger of being diagnosed as a consequence of the fiscal deficit, or excessive public spending. In this situation, an austerity program designed as an adjustment response would worsen the recessive trends and deepen social conflict, emigration, violence, and political instability. Instead, a rational adjustment program should include the promotion of female employment, reindustrialization and reagriculturization, as well as the design of social and industrial policies that, through the deliberate implementation of policies, governments would ensure that the environment is protected, social safety nets are in place, social expenditures are increased, and the elderly, the LGBT population, women and persons with disabilities are protected.

It is valid to propose that there is a silent battle between the consequences of perverse policies of the past, especially openness, and what must be done in the present to impart resilience to economies so that they can acquire dynamism in the face of the burdensome effects of bad policies from the past. That is, the effects of new policies are offset by the accumulated effects of past policies.

Therefore, there is urgency in addressing the social sector and especially in eliminating the destructive policies of openness. In the absence of a titanic response, the economic and social deterioration will deepen even further and an eventual recovery may be more difficult to achieve.

The sad reality of economies may go unnoticed by the consumption “booms” to which remittances give rise, but the fact is that remittances themselves represent the reality of the failure of past development attempts, which gave rise and give rise to the export of people who seek the “American dream” to escape the “national nightmare.”

That is to say, it is time to overcome and break free from the rantings and deadweights promoted by economic stories, and undertake the recovery of economies, within a framework of policies and actions that value women, men, family, solidarity, and social cohesion, and leave behind the fantastic tales of “globalization”, “markets”, “competition”, “flashgordon”, “individualism”, “free trade”.

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Notes

Note 1. These authors recommend supporting human capital as a means of alleviating supply constraints resulting from a health crisis:

“Replenishing human capital accumulation, including through promoting early childhood education development programs and life-long learning as well as improving education systems will help mitigate an adverse impact on

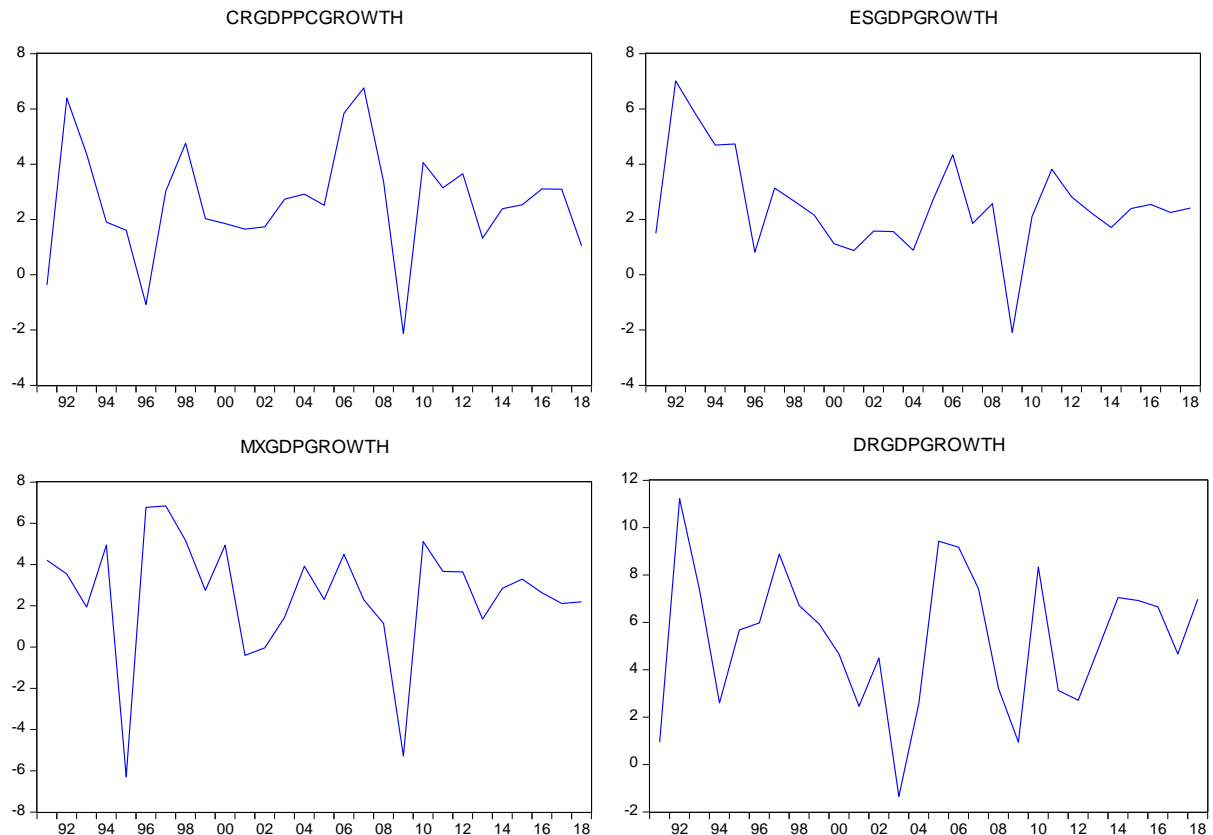
aggregate productivity.”

Note 2. The data on the underground economy as a percentage of GDP were taken from Scheneider and Medina (2019).

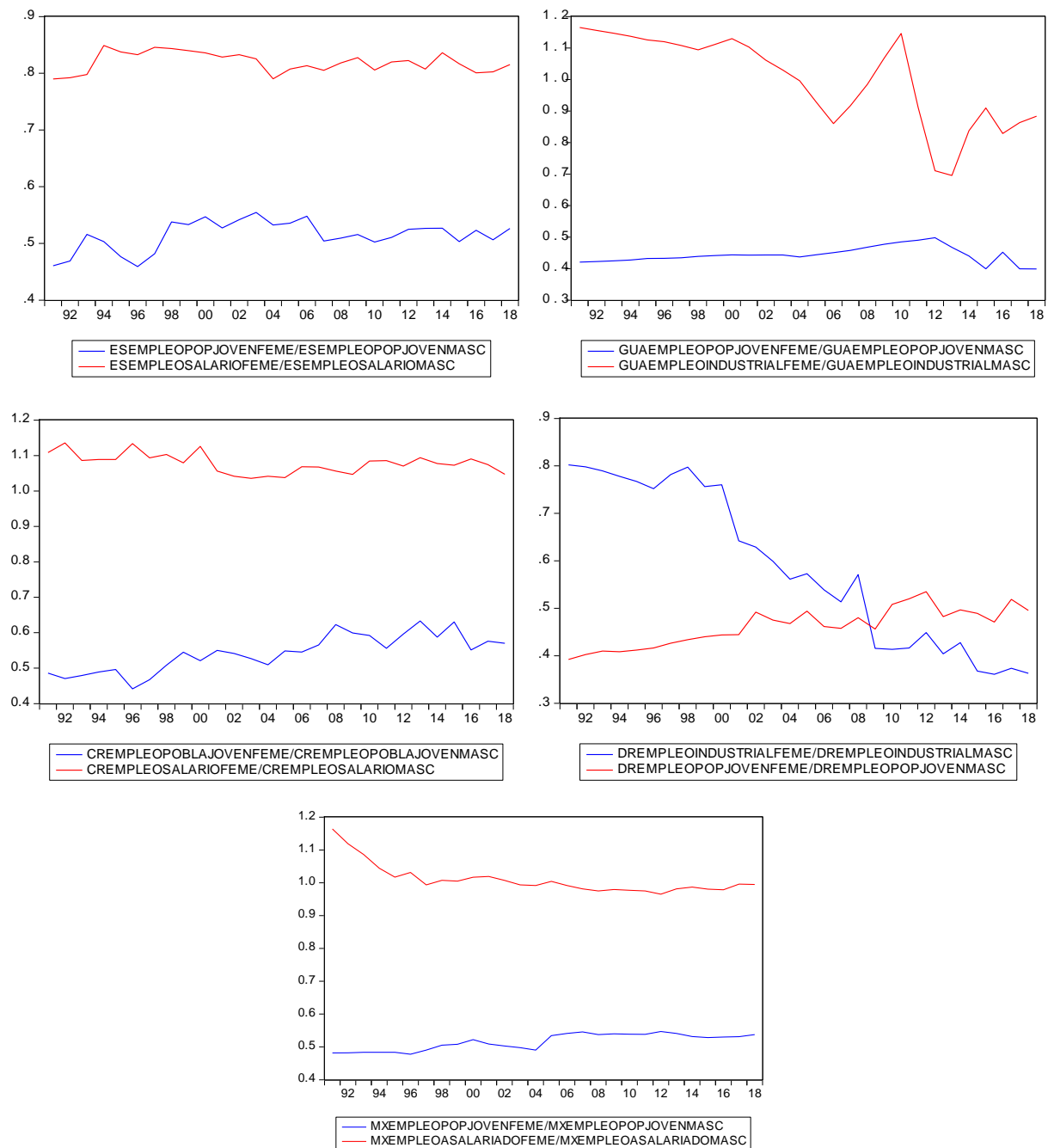
Note 3. The scores are found in (TERCE, 2016). These tests are carried out periodically by the UNESCO regional office in Santiago de Chile.

Note 4. Lochner and Moretti (2004) have shown that in the US, the drop in crime caused by a 1 percent increase in high school graduation results in benefits to society of \$1.1 billion.

Appendix 1. Economic growth rates of the countries under study.



Appendix 2. Employment Ratios



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