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Banking and Monetary Crises: Impacts on Exports of MENA Countries

By Mohamed Ben Abdallah and Zouheir Bouchaddakh*

In this paper we try to contribute to the limited literature treating the impact of financial crises on exports. In addition to exports of goods we emphasize on exports of services. We quantify both the level and duration of exports collapse due to monetary and banking crises. Estimating a gravitational model of unilateral trade for the MENA countries over the period 1970-2011, we find that after currency and banking crises in the partner countries, exports of MENA countries decreased significantly. However, exports of services of MENA countries are not as adversely affected by financial crises.

Keywords: Trade, Gravity Models, Monetary Crisis, Banking Crisis, MENA Region

JEL Classification: F10, G01

I. Introduction

Away from the empirical debate on the direction of causality in the relationship between finance and growth, it is widely acknowledged that a good performance of the financial system is favorable for economic development. Indeed, a developed financial system allows for an improvement in the effectiveness of the capital allocation within the economy, which consequently improves investment, growth and economic development. The financial crises indirectly confirm the utility of the financial system since their occurrence produces a disorganization in the financial systems, which often leads to strong recessions, economic crises and social conflicts.

With globalization, the perverse effects of the financial crises have exacerbated. Because of financial globalization, crises propagate more quickly. In addition, the increasing openness of the economies has contributed to the amplification of the real effects of the financial crises. Thus, most financial crises turned into real recessions with a deceleration of economic growth and higher unemployment rates. However, the most outstanding fact is that the financial crises were accompanied by a collapse of exports. For example, in the 2008 financial crisis, real world exports dropped by 17 percent while GDP fell by 5 percent (Amiti and Weinstein, 2011).Thus, exports fell sharply and out of proportion with the fall in demand. The latter is insufficient to explain the decline in exports. Eaton *et al.* (2011) find that for China and Japan, which account for 15 percent of world exports, demand shocks only explained 8 to 23 percent of the remarkable declines in their export to GDP ratios.

The reason is that, beyond the fall in demand, financial crises are associated with the intensification of financing difficulties and shortages of liquidity. Recent literature about financial

*Zouheir Bouchaddakh: FSEG Nabeul, University of Carthage. E-mail: z.bouchaddakh@fsegt.rnu.tn. Phone: (00216) 98208768. Fax: (00216) 72232318. Mohamed Ben Abdallah: FSEG Tunis, University of El Manar. E-mail: mohamed.benabdallah@fsegt.rnu.tn. Phone: (00216) 96878332.

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crises shows that negative export performance can be attributed to financial constraints. For example, Amiti and Weinstein (2011) believe that one-third of the 1993 Japanese export collapse is attributed to financial constraints.

In this paper we look at the impacts of financial crises on the exports of goods and the exports of services in the case of MENA countries.[1] We try to quantify both the level and duration of exports collapse due to monetary and banking crises. By doing this, we hope to contribute to the limited literature on the subject. According to the authors' knowledge, this paper is the first to explore this issue with regards to MENA countries and aspires to distinguish between trade of goods and trade of services in that respect.

The rest of the paper is organized as follows. Section II focuses on the role of financing constraints in the relation between trade and financial crises. Section III studies the impact of banking, monetary and twin crises on exports. Section IV presents some stylized facts concerning the frequency of financial crises and the nature of exports in the MENA region. Section V provides the empirical analysis of the impact of financial crises on exports of goods and services in MENA countries. Section VI concludes.

II. Financial Crises and Trade: The Role of Financing Constraints

The link between trade and finance is obvious. First, most of financial crises were marked by the sharp drop in international trade. Second, global imbalances, and particularly commercial imbalances, are believed to be the origin of most financial crises (Obstfeld and Rogoff, 2009; Portes, 2009). Even if this point fails to gain unanimous support, it is widely accepted that international trade is one of the channels through which financial crises have a "contagious effect". Thus, several authors show that intensified trade relations contribute to the explanation of the propagation of financial crises (Eichengreen and Rose, 1999; Glick and Rose, 1999; Kaminsky and Reinhart, 2000; Forbes, 2001; Forbes and Rigobon, 2002; Caramazza *et al.*, 2004; Frankel and Cavallo, 2004).

While the focus of several preceding studies was on whether trade linkages play a role in transmitting crises across countries, few studies were interested in the inverse relationship that concerns the effect of the financial crises on the international trade. The first studies on this subject emphasized the role of financial constraints in the export behavior of firms. Some authors believe that by signaling[2] and diversification[3] effects, exporting companies should have a comparative advantage in overcoming financial constraints. This conclusion was disputed by a large number of authors (Amiti and Weinstein, 2011; Bellone *et al.*, 2011; Bernard and Jensen, 1999 and 2004; Chaney, 2005; Manova, 2008). It is clear from their work on the relationship between exports and financial constraints that the direction of causality could be reversed from what is expected under the signaling and diversification effects. Indeed, exporting firms are more sensitive to financial constraints. The conquest of exterior markets implies specific fixed costs and some firms are limited in their capacity to finance these costs. Thus, "in the presence of fixed costs associated with exporting and liquidity constraints, some firms could profitably export, but they are prevented from doing so

[1]Algeria, Bahrain, Djibouti, Egypt, Iran, Irak, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Mauritania, Morocco, Oman, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen.

[2]In the presence of asymmetry of information, the fact of exporting could be interpreted by the investors as a signal of company's efficiency. Thus, firms that come to export can profit from a better notation and a lower cost of borrowing. (Ganesh-Kumar *et al.*, 2001).

[3]Exporting to different markets decreases dependency on demand resulting from domestic market. By selling their products to markets whose business cycles are not very correlated, companies will be less exposed to demand shocks (Campa and Shaver, 2002).

because they cannot gather sufficient liquidity. Only those firms that are not liquidity constrained are able to export."[4] Amiti and Weinstein (2011) argue that due to longer transportation delays (especially maritime), exporting firms are more sensitive to financial constraints. More lengthened deadlines for payments and a higher risk of defect increase the requirements in working capital and, thus, the dependence of the exporting firms with respect to the bank-based financing.

Sensitivity to financial constraints makes exporting firms more vulnerable to financial shocks. Thus, it is the tightening of financial constraints following the financial crisis that explains the sharp and disproportionate[5] drop of exports. This tightening of financial constraints is more supported in the case of a financial crisis taking the form of a banking crisis.

III. Impact of Different Types of Crises on Exports

For some economists, a financial crisis takes real importance only when it shakes the payments system and blocks the operations of the financial intermediaries. In other words, a financial crisis becomes problematic and constitutes a real threat when it takes the form of a banking crisis, monetary crisis, or both (twin crisis). Thus, the impact of the financial crises on exports can be studied according to the different types of crises.

A. Impact of Banking Crises

The recent literature relating negative export performance to financial constraints considers that a financial crisis is essentially a banking crisis.

A banking crisis is marked by the deterioration of the quality of assets held by banks. The financial position of banks is difficult due to the deterioration of the portfolio's value and increased non-performing loans. Banks are unable to pay all creditors because of difficulties in liquidating investments.

Theoretically, a bank is considered insolvent when it is unable to meet all its commitments. The insolvency of a bank may involve bankruptcy. This happens when bad news on the state of the banking assets lead to the phenomenon of massive withdrawals of deposits.[6] A bank's bankruptcy can cause a domino effect in all the other banks and then the bank run is transformed into a banking panic.

In the case where a financial crisis turns into a banking crisis, the exports' collapse is caused by two channels. The first is a credit channel where the struck banking sector reduces lending due to a negative liquidity shock (Bernanke, 1983; Chang and Velasco, 2001; Yousefi, 2011).The second is a balance channel where the financial crisis weakens the valuations of the companies and decreases their net worth. Bernanke and Gertler (1989) highlight the dynamic effects of the financial accelerator mechanism. In the presence of information asymmetries, the net worth of borrowers plays a central role in the dynamics of investment. The authors show that shocks to the net worth of firms contribute to amplifying the fluctuations by changes in the conditions of access to finance.

In short, firms cannot export either because they are insolvent (balance channel) or because they cannot borrow as banks tighten lending conditions due to a credit crunch (credit channel).

Most empirical studies dealing with the relationship between banking crises and trade consider systemic crises. Ma and Cheng (2005) used a sample of 52 countries over the period1981-1998.They

[4]Chaney (2005, p. 3).
[5]Compared to the fall in GDP.
[6]Random withdrawal theory (Diamond and Dybvig, 1983).

found that imports and exports decline significantly two years after the occurrence of banking crises. Berman and Martin (2012) studied the effects of the 2008 financial crisis (banking crisis in particular) on trade when the crisis occurs in a partner country. The authors found that exports of sub-Saharan Africa fell following the financial and banking crisis of 2007-2008. The authors concluded that the low financial development in Africa does not protect its countries' economies against financial crises. Similar to the two previous studies, Abiad *et al.* (2011) use a gravity model to study the effects of banking crises on trade. The authors find that—over the period 1970-2009 and for a large sample of countries (153)—trade is negatively affected by financial crises (banking and currency crises). Amiti and Weinstein (2011) take the case of Japan between 1990 and 2010 to show that financial shocks, in the form of bank fragility, affect exports much more than they affect local sales. The authors establish the link between exporting firms and institutions that fund them. Thus, the fall in exports is explained by the high sensitivity of exporting firms to the financial fragility of banks.

B. Impact of Monetary Crises

The financial crisis may be associated with a currency crisis but not automatically. A country with a closed economy may face a financial crisis without experiencing a crisis in the balance of payments due to the absence of foreign exchange transactions. However, within a global economy that is commercially and financially integrated, currency crises have become more frequent. A country may be affected by a currency crisis due to imbalance in its balance of payments or simply by contagion. Crises can spread to several countries due to growing financial interdependence. A monetary crisis generally appears after speculative attacks on the domestic currency, which causes a run to sell that currency. This leads to a loss in official foreign exchange reserves, an increase in interest rates and, generally, to a devaluation of the domestic currency. In doing so, the crisis may weaken demand and aggregate supply, particularly by raising the cost of imports, investment and external debt services. The depreciation of the currency and the temporary increase in interest rates may force firms into bankruptcy (Ben Abdallah and Diallo, 2004).

In traditional models, the impact of the currency crisis on exports passes through the variation of the exchange rate. It is a competitiveness effect induced by the devaluation of the real exchange rate. The change in relative prices should theoretically increase exports. However, empirical studies on this subject fail to detect such a positive effect. Thus, contrary to the expectations of theoretical models, the recent currency crises in emerging markets, accompanied by devaluations of the real exchange rate, have often been followed by a decline or stagnation in exports. Such was the case of South-East Asian countries after the 1997-1998 crisis. Despite devaluation in the real exchange rate of approximately 60 percent, Asian exports moved in the opposite direction of the competitiveness effect (Berman, 2009). The same phenomenon was observed in the case of some Latin American countries (Brazil in 1999, and Argentina and Uruguay in 2002).

Berman (2009) explains these results by the existence of an effect of "destruction" that goes against the competitive effect. Accompanied by an increase in interest rates, the currency crisis has a financial aspect. It exerts a balance effect that threatens the solvency of some firms. The expected result is negative and leads to the decrease in the number of exporting firms. This decrease in the number of exporting firms was detected by Blalock and Roy (2007) in the case of Indonesia after the Asian crisis of 1997-1998. Some firms that exported before the crisis left the export market despite a favorable exchange rate.

In sum, the full effect of currency crises on exports depends on the relative importance of the effects of competitiveness and destruction. It depends on the country's specialization and degree of financial market imperfections (Berman, 2009).

Under certain conditions, a currency crisis may cause a banking crisis and vice versa. The coincidence of these two crises gives rise to a twin crisis.

C. Impact of Twin Crises

For Kaminsky and Reinhart (1999), the twin crises are a particularly important feature of the contemporary international financial integration. The link between monetary and banking crises was absent in the early 1970s but became obvious since the 1980s. Its main cause is the financial liberalization in several countries. Financial crises are increasingly crises of illiquidity in the sense that banks or monetary authorities are unable to meet their commitments in terms of internal (for the banks) or external (for the authorities defending a fixed parity) convertibility of the currency. On one side, banks are short for liquidity due to massive withdrawals of deposits. On the other side, the authorities face a loss of foreign exchange reserves. Kaminsky and Reinhart (1999) established that the difficulties of the banking sector generally precede the monetary crisis which further exacerbates the banking crisis giving rise to a vicious circle. However, the causal relationship between the two crises is not unidirectional.

Thus, balance of payments problems (Stoker, 1995) or a devaluation of the currency (Mishkin, 1997) may cause problems for the banking sector and transform a currency crisis in a banking crisis.

A priori, the impact of the twin crises on exports of a country is a result of the impact of both crises. In reality, the effects are much more important. The reason is that in case of the coincidence of the two types of crises, each one feeds the other and they both draw the economy into a negative vicious circle. Thus, financial sector problems undermine the currency. Devaluations, in turn, aggravate the existing banking sector problems and create new ones. These adverse feedback mechanisms are in line with those suggested by Mishkin (1997) and can be amplified, as in several of the recent Asian crises, by banks' inadequate hedging of foreign exchange risk. The presence of vicious circles would imply that the twin crisis is more severe than a currency or a banking crisis that occurs in isolation (Kaminsky and Reinhart (1999, p. 479).

Thus, in the case of a twin crisis, the impact on the real economy can be more devastating than the combined negative effects of currency and banking crises. Bordo *et al.* (2001) find that a twin crisis is more persistent in time and costs more than double the cost of a financial crisis (banking or monetary).

IV. Financial Crises and Exports in the MENA Region: Some Stylized Facts

Before studying, econometrically, the impact of financial crises on exports of goods and services in the MENA region, we present some stylized facts. We first describe the nature of exports of the MENA countries, and then we identify the financial crises in these countries. Finally, we present the behavior of exports of goods and services around the dates of the various types of crises.

A. Nature of Exports of MENA Countries

As previously reported, the effects of financial crises (especially monetary) depend on the country's specialization amongst other things. A high concentration of trade in commodities increases vulnerability. In this sense, Berman and Martin (2012) reported a strong dependence of sub-Saharan African countries on primary products. This has contributed to the severe impacts of the financial crisis on exports from these countries to the United States. Similarly, Abiad *et al.* (2011) find that the decline in exports consecutive to financial crises is more persistent for primary products.

However, knowledge of the nature of exports is important before considering the vulnerability of exports to financial crises. Table 1 shows the characteristics of MENA exports compared to other regions and the global average.

The composition of exports from the MENA region has not changed significantly since the 1960s reflecting a low mutation of productive structures of the economies of the region. The value of primary product exports (mining products and agricultural products) has represented more than three-quarters of MENA region's total value of exports during the 1990s and 2000s. It thus appears that countries of the MENA region are rather specialized in exporting primary products. We note, however, a tendency for some countries in the MENA region to specialize in exports of manufactured goods (Malta and Tunisia).

Table 1: Nature of Exports of Goods and Services (Percentage), Period Averages

	Share of manufactured products in exports of goods		Share of services in total exports		Share of travel services in exports of services		Share of transport services in exports of services	
	1990-	2000-	1990-	2000-	1990-	2000-	1990-	2000-
East Asia and Pacific	83.5	83.4	15.6	15.3	28.4	24.7	28.5	29.5
Europe and Central Asia	77.9	74.7	21.8	22.9	31.2	25.6	26.3	23.2
Latin America and Caribbean	51.6	54.4	14.2	11.2	53.4	55.9	23.5	17.8
MENA	24.9	19.4	19.8	16.5	-	35.1	-	25.4
North America	74.2	71.9	24.2	25.0	36.1	28.6	22.0	15.4
South Asia	76.0	73.2	20.7	29.0	29.0	15.6	28.7	21.0
Sub-Saharan Africa	29.0	31.4	15.3	13.7	33.8	43.0	25.3	25.4
World	75.0	72.7	20.3	20.3	33.1	28.2	26.3	23.3
Some countries in the MENA region								
Algeria	3.2	2.0	3.4	4.9	17.9	8.2	43.4	28.8
Bahrain	31.7	10.8	13.8	19.0	41.6	43.2	48.1	24.5
Djibouti	10.1	90.7	81.7	83.4	17.5	9.5	63.1	77.7
Egypt	37.4	32.3	64.9	51.0	31.3	46.0	37.2	31.7
Iran	9.4	9.7	4.7	4.6	13.0	36.9	25.8	49.4
Iraq	-	0.2	-	1.9	-	37.6	-	39.8
Jordan	50.6	70.7	52.3	38.5	38.5	63.1	21.7	18.8
Kuwait	10.3	4.4	16.0	11.7	14.3	4.9	81.6	60.4
Lebanon	68.8	69.3	-	78.0	-	53.2	-	3.5

Table 1: Nature of Exports of Goods and Services (Percentage), Period Averages: Continues

	Share of manufactured products in exports of goods		Share of services in total exports		Share of travel services in exports of services		Share of transport services in exports of services	
	1990-	2000-	1990-	2000-	1990-	2000-	1990-	2000-
Libya	5.1	-	0.7	1.7	17.7	50.2	66.6	31.8
Malta	96.9	91.9	37.9	44.7	63.2	38.4	24.6	18.7
Morocco	55.4	66.2	27.8	40.0	67.4	62.2	17.3	17.4
Saudi Arabia	8.6	8.8	7.1	5.5	-	51.1	-	18.5
Syria	14.0	17.0	29.5	23.7	66.3	76.4	20.4	11.8
Tunisia	76.1	76.2	32.2	27.5	63.1	55.5	25.2	26.9
United Arab Emirates	15.3	3.1	-	-	-	-	-	-
Yemen	0.5	1.2	9.1	8.0	38.4	57.0	22.8	12.3

Source: World Bank, *World Development Indicators*

In the 2000s, the average share of total export earnings derived from exports of commercial services was about 17 percent of overall revenues from exports of goods and services in the MENA region. In several countries of the region, exports of services generally represented more than 50 percent of total exports of goods and services, especially in Djibouti (83.4 percent), Egypt (51 percent), and Lebanon (78 percent). Over the period 2000-2010, among the categories of services exported most were travel services with an average share of 35 percent. The transport service and other commercial services represented 25 percent and 40 percent respectively.

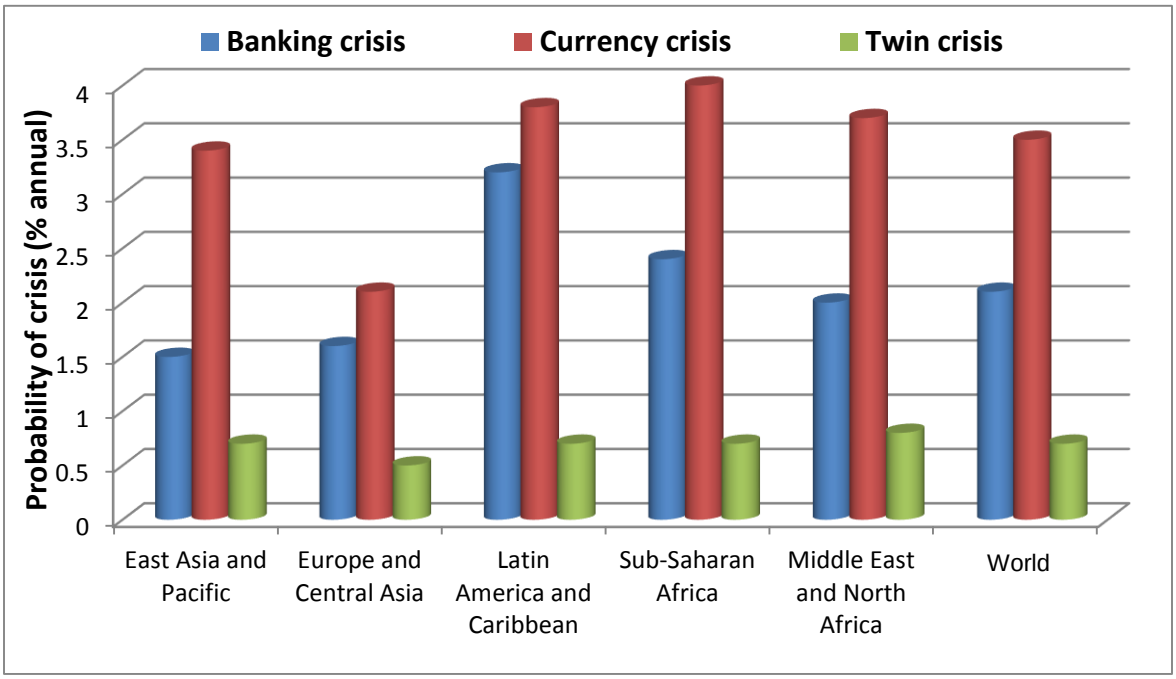
The vulnerability of exports to financial crises also depends on the structure of exports. A strong geographical concentration makes the fall in exports more dramatic in the event of a financial crisis hitting the main trading partner. Contrarily, a portfolio of diversified exports would be less affected by financial shocks. In MENA countries, export structures differ considerably.

B. Frequency of Financial Crises

Figure 1 shows the frequency of crises over the period 1970-2007 in the world, MENA and other regions. Frequency corresponds to the number of episodes of financial crises divided by the number of country-year observation, by region.[7]

[7]Episodes of financial crises are extracted from Laeven and Valencia (2008 and 2010).

Figure 1: Frequency of Crises



Source: Compiled by the author

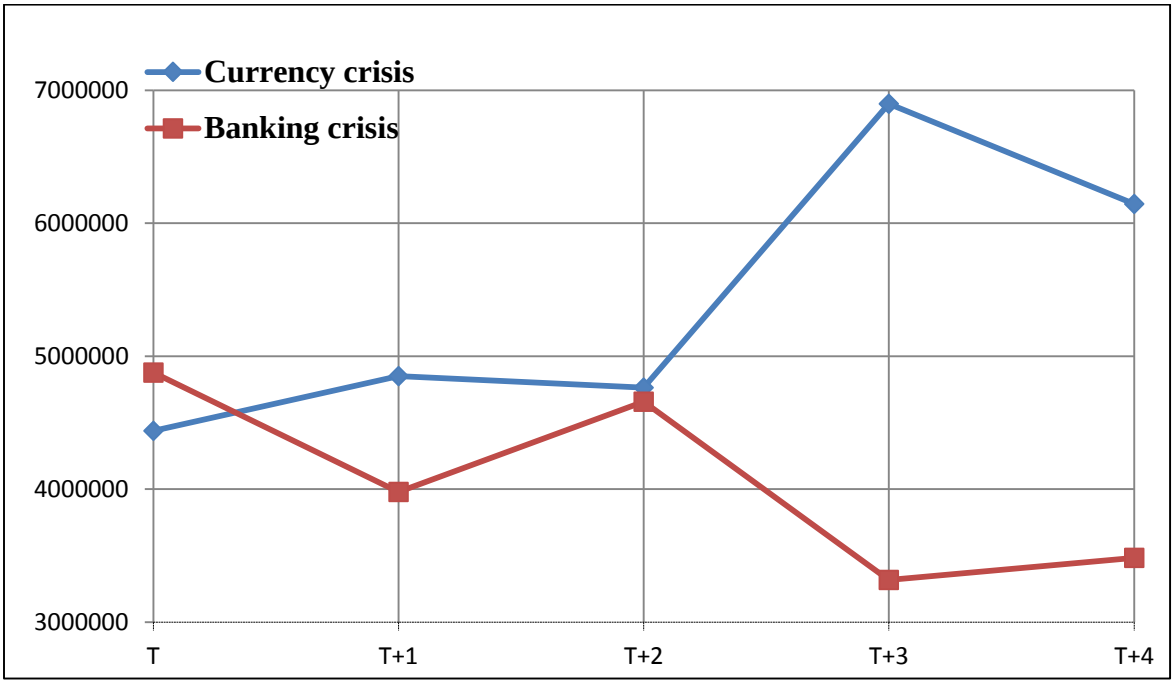
The frequency of crises in the MENA region is very close to the global average (3.7 percent and 3.5 percent respectively). For emerging countries, we find that Latin American countries are more likely to experience a currency crisis or a banking crisis than South-East-Asian countries. At the aggregate level, we find that the frequency of a currency crisis is higher than that of a banking crisis. However, the frequency of twin crises is very low and thus it is more difficult to analyze their impact on the evolution of exports.

Given the high frequency of banking and monetary crises both in MENA countries and in the partners of the region (the United States of America and Europe), it is quite natural and logical to examine their economic consequences on the region's exports. As a first step, one can sense the trend by examining the stylized facts concerning the evolution of exports of goods and services during periods of financial crises.

C. Evolution of Exports around the Dates of Crises

In order to proceed with the preliminary statistical analysis of our data, we calculated for our sample of countries in the MENA region and period, the average exports after a crisis. Figure 2 shows the evolution of these averages over a period of 4 years.

Figure 2: Behavior of Exports of Goods after the Date of the Financial Crisis (T)



Source: Compiled by the author

It appears that the banking crises are on average followed by a decline in exports. We note that, unlike banking crises, currency crises have a positive impact on exports. It also appears that the twin crises have a positive effect on exports after two years of their occurrence.

However, the stylized facts and the preliminary statistical analyses conducted are not enough to prove whether these contractions in real activity are a result of only the crises or whether they are a result of other factors. The econometric analysis in the next section will allow us—while controlling for the effect of a number of factors that affect growth and investment—to see how crises affect the evolution of exports.

V. Empirical Analysis of the Impact of Financial Crises

The aim of our empirical analysis is to evaluate the occurrence of monetary and banking crises on exports of goods and exports of services in MENA countries for the period 1970-2011. This objective is achieved using an augmented gravity model approach which seems appropriate to study this kind of question.

A. *Methodology and Analysis*

The volume of exports between countries *i* and *j* in year *t* can be characterized by:

$$LnX_{ijt} = \alpha_{ij} + \alpha_t + \sum \alpha_k crise_{i,t-k} + \delta_1 Ln\mathrm{GDP}_{i,t} + \delta_2 LnPopulation_{i,t} + \sum \beta_k crise_{j,t-k} + \sigma_1 Ln\mathrm{GDP}_{j,t} + \sigma_2 LnPopulation_{j,t} + \theta' \mathrm{LnZ}_{ijt} + \varepsilon_{ijt},$$

t = 1,…,T, (1)

where X_{ijt} is real exports of goods from country *i* to country *j* in year *t*,[8] and $Z_{ijt} = [\ z_{it}z_{jt}... \ ]$ is the $1 \times k$ row vector of gravity variables (contiguity, colonial links, common language and distance).

$Crise_{it-k}$ is a dummy variable taking the value of 1 if MENA exporter country *i* has a financial crisis at year *t-k* and zero otherwise.

$Crise_{jt-k}$ is a dummy variable taking the value of 1 if the importer country *j* has a financial crisis at year *t-k* and zero otherwise.

For these financial crisis variables we consider four lags to test the persistence of the impact of financial crises on exports. We choose four years as the lag variable because the coefficients of crises in the importing and exporting country become statistically insignificant after 4 lags.[9]

The intercept has two parts, one is specific to year *t* and common to all pairs, α_t, and the second is specific to the country pairs and common to all years, α_{ij}. α_t represents time dummies, which capture factors that affect all countries' trade simultaneously, such as global changes in commodity prices, and α_{ij} controls for all possible time-invariant country-pair characteristics such as distance, common language, common border, etc.[10] The disturbance term ε_{ijt} is assumed to be normally distributed with zero mean and constant variance for all observations. It is also assumed that the disturbances are pair wise uncorrelated. The other variables are defined in Table A.1.

Our sample contains 29,785 bilateral importer*exporter*year observations. We use the unidirectional trade value of 23 exporting MENA countries and 39 partner countries for 42 years. This gives us 881 country pairs. Table A.2 presents summary statistics of the variables used in the empirical analysis.

B. Results

Giving the fact that we have a panel of 42 years, we check the stationarity of the variables considered. We cannot implement the standard tests (Levin-Lin-Chiu, Im-Pesaran-Shin, Hadri LM Stationarity) of stationarity because they require strongly balanced data. Hence, we use Fisher-type unit-root test for panel-data which reveals that, except the GDP in partner country which is weakly stationary, all variables are stationary. So the OLS methodology that we use to estimate gravitational model is valid.

Table 2 presents the coefficients estimated from the augmented gravity model using the specification of equation (1). Since the baseline specification includes importer*exporter fixed effects, the usual gravity time-invariant country-pair controls, such as distance, etc., are not included. We incorporate into the standard gravity model the current and lagged crisis indicators in the partner and exporter countries. Notice that the banking crisis dummy and the currency crisis dummies are introduced separately.

[8]To avoid the mirror statistics issue instead of the real exports of goods from country *i* to country *j* we use the real imports of goods of country *j* from country *i.*

[9]Ma and Cheng (2005) claim that lags in excess of two years would run into an identification problem of whether an observed effect was caused by the current or previous crisis.

[10]The importer-exporter pair dummies also proxy for the multilateral trade resistance effects (Anderson and Van Wincoop, 2003).

Table 2: Exports Following Currency Crises: Pooled Panel Gravity Estimates. 1970-2011

Dependent variable: log (exports) at level in year *t*		
	Currency Crises	Banking Crises
Exporter Crisis t	-0.041 [0.062]	0.038 [0.097]
Exporter Crisis t-1	0.041 [0.056]	0.136 [0.093]
Exporter Crisis t-2	-0.092 [0.065]	-0.054 [0.086]
Exporter Crisis t-3	0.006 [0.063]	0.039 [0.088]
Exporter Crisis t-4	-0.036 [0.061]	0.143* [0.080]
Partner Crisis t	-0.260** [0.111]	-0.141*** [0.072]
Partner Crisis t-1	-0.018 [0.103]	-0.235*** [0.068]
Partner Crisis t-2	0.009 [0.092]	-0.164*** [0.064]
Partner Crisis t-3	0.031 [0.095]	-0.007 [0.063]
Partner Crisis t-4	0.028 [0.103]	0.015 [0.076]
Log Exporter GDP	1.810*** [0.109]	1.575 [0.113]
Log Partner GDP	1.640*** [0.110]	1.828 [0.107]
Log Exporter Population	-0.366*** [0.110]	2.014 [0.260]
Log Partner Population	1.973*** [0.262]	-0.381 [0.110]
R-squared	0.810	0.811
Number of Observations	16330	16330
Number of Partner-Exporter Pairs	881	881
Partner-Exporter Dummies	Yes	Yes

Notes: This table shows the estimates from regression Equation (1) in the text. All reported coefficients are from the same regression. The regression includes year and partner-exporter dummies. Robust standard errors clustered at the partner-exporter pair level in parentheses. Significance at the 1. 5 and 10 percent indicated by ***. ** and * respectively.

As expected, the gravity model fits the data well, explaining about 81 percent of the variation of exports. On average, the estimated coefficients of the partner-and exporter-time varying control variables such as GDP and population are plausible and similar to findings in the literature.

The key variables of interest are the partner and exporter crisis dummies and their lags, which capture the effect that a crisis has on a country's partners and exports during its onset and in the following 4 years, after controlling for the standard gravity determinants of trade (some of which are also affected by the crisis).

The first column of Table 2 shows the impact of the exporter and partner currency crises on exports. Only the short-term effects of partner currency crises on exports were negative and significant (i.e., the coefficient of *t* is significantly positive). There is a small drop in exports in the year of the partner's currency crisis. Exports recover quickly and are back to their predicted level in the year following the crisis. In contrast, the effects of the exporter's currency crisis on exports were insignificant. This result can be explained by the fact that, on average, the MENA countries are specialized in the production of primary goods including commodities which are often priced in foreign currency. Hence, the exchange rate depreciation associated with the crisis does not boost exports to an extent similar to other product categories.[11]

The second column of Table 2 shows the effects of exporter's and partner's banking crises. We find that exports decrease significantly after a partner's banking crisis. Thus, the estimated coefficients on contemporaneous and lagged partner's banking crisis dummies are all negative and statistically significant at the one percent level (except the third lag, which is insignificant). On average, exports fall by 14 percent below the gravity-predicted level in the year of the crisis, and by 20 percent in the following year.

The evolution of exports following an exporter's banking crisis is much more muted. The estimated coefficients on the crisis dummy and its lags in Table 2 are often statistically insignificant.

So why does a crisis in a partner country have a stronger and more persistent impact on exports of MENA region relative to a crisis in the exporter's country, and especially a banking crisis?[12]

One possible explanation is that exports of a country are dependent on external demand and we should not observe a harmful effect of a crisis at home on exports.

Another potential explanation could be that crises are associated with an increase in protectionism. After a crisis, interest groups that favor protecting domestic production may be strengthened. Finally, another possible channel through which partner crises may adversely affect exports is through the volatility of the exchange rate that could be an important potential channel through which crises affect exports adversely in the short run.

The results reported in Table 2 present the effect of crises on the exports of MENA countries for all products. In order to analyze whether the effect of a financial crisis varies for manufactured goods, we estimate Equation (1) only for such goods. In fact, the 2008-2009 global recession showed that the impact of financial crises on trade varied across different product categories. Abiad *et al.* (2011) confirmed empirically this pattern for all earlier crises.[13]

Table 3 presents the estimated coefficients for the exports of manufactured goods.

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[11]See Abiad *et al.* (2011).

[12]Abiad *et al.* (2011) find a similar result; that there is a sharp decline in a country's imports in the year following a crisis and in contrast, exports of the crisis country are not adversely affected.

[13]"Capital and consumer durables experience the largest short-term drop, with an average drop of 23 percent in the year after crises…Finally, imports of primary goods seem to be least affected by a crisis." (Abiad *et al.*, 2011, p. 19).

Table 3: Exports Following Crises: Pooled Panel Gravity Estimates. 1970-2011

Dependent variable: log (exports of manufactured) at level in year *t*		
	Currency Crises	Banking Crises
Exporter Crisis t	0.032 [0.073]	0.125 [0.105]
Exporter Crisis t-1	0.146** [0.069]	0.204** [0.100]
Exporter Crisis t-2	-0.005 [0.070]	0.121 [0.099]
Exporter Crisis t-3	0.025 [0.070]	0.188** [0.090]
Exporter Crisis t-4	-0.055 [0.068]	-0.024 [0.097]
Partner Crisis t	-0.212* [0.112]	-0.273*** [0.077]
Partner Crisis t-1	-0.014 [0.106]	-0.332*** [0.071]
Partner Crisis t-2	0.066 [0.103]	-0.321*** [0.069]
Partner Crisis t-3	0.013 [0.100]	-0.203*** [0.075]
Partner Crisis t-4	0.043 [0.114]	-0.060 [0.081]
Log Exporter GDP	0.175 [0.118]	0.179* [0.115]
Log Partner GDP	1.743*** [0.133]	1.587*** [0.136]
Log Exporter Population	1.683*** [0.092]	1.670*** [0.092]
Log Partner Population	1.229*** [0.310]	1.365*** [0.306]
R-squared	0.805	0.805
Number of Observations	15575	15575
Number of Partner-Exporter Pairs	881	881
Partner-Exporter Dummies	Yes	Yes

Notes: This table shows the estimates from regression Equation (1) in the text. All reported coefficients are from the same regression.
The regression includes year and partner-exporter dummies. Robust standard errors clustered at the partner-exporter pair level in parentheses. Significance at the 1, 5, and 10 percent indicated by ***. ** and * respectively.

While currency crises in partner countries seem to have the same impact in the case of manufactured goods and that of total exports (same magnitude and duration), banking crises in partner countries have a more pronounced impact. On average, exports fall about 33 percent in the year

after a banking crisis and remain 20 percent below normal after 3 years. The decline in exports of manufactured goods is also more persistent; those exports recover to normal 3 years after the crises against 2 years for total exports. This result shows that primary goods seem to be less affected by a banking crisis in partner countries than manufactured goods.[14]

In contrast to total exports, where currency crises do not have any impact on exports, the exports of manufactured goods seem to be boosted after a currency crisis. This conforms with the competitiveness effect which seems to be more pronounced than the destruction effect. However, the positive impact persists for only one year.

C. Robustness

We check now if our main results are robust to a number of robustness tests, such as bilateral country-pair variables or reverse causality.

As an alternative to estimating Equation (1) with importer*partner fixed effects, we present, in tables A.3a and A.3b, the traditional gravity model which includes fixed effects for the exporter and partner countries separately. This specification makes it possible to estimate the coefficients on the standard time-invariant country-pair characteristics such as distance, a common land border, common language, and colonial ties. The main results are robust to this alternative specification: exports fall substantially and persistently following banking crises in partner countries especially for manufactured goods, while exports are less affected and recover quickly after currency crises in partner countries. The estimated coefficients on most other bilateral trade variables are similar to what has been found in the literature. For example, increased distance reduces exports, while common land border and colonial linkages enhance trade significantly.

In addition, our estimates may be biased due to the reverse causality. For example, the occurrence of a crisis may be affected by the behavior of exports. To treat this problem, we drop contemporaneous crisis episodes which are more likely to be endogenous to the behavior of exports. The estimated coefficients on the crisis indicators are almost identical to the baseline specification. These results are not reported for brevity.

Concerning endogeneity issue between GDP and crises variables, we have estimated several specifications of the model by dropping and inserting different lags we have not observed any change in the estimated coefficients on the crisis indicators. In addition, this problem has been evoked in precedent work (Ben Abdallah and Diallo, 2004). Endogeneity between GDP and crises is not relevant.

These various robustness tests support the main results that currency and banking crises of trade partners are associated with a persistent decline in exports of the MENA region. These effects persist for one and three years respectively after the date of crises, especially for manufactured goods, while exporter currency crises have a positive impact on exports but only for one year.

D. Exports of Services

We now turn to the impact of financial crises on the exports of commercial services in the MENA region. For this, we estimate an aggregate version of the gravity model. We decide on this

[14]This may be due to the fact that the demand for manufactured goods is more elastic than the demand for primary goods.

particular model due to data constraints; there is a lack of detailed data on exports of all MENA countries by trading partner pair.[15]

Notice that the aggregate version is analogous to estimating Equation (1) weighted by size of the partner.[16]

The estimating equation for the aggregate gravity model is specified as follows:

$$LnX_{i,t} = \alpha_i + \pi_t + \sum \beta_j crise_{i,t-j} + \delta_1 Ln\text{GDP}_{i,t} + \delta_2 Lnpopulation_{i,t} + \sum \gamma_j Pcrise_{i,t-j} + \gamma_1 LnPGDP_{i,t} + \gamma_2 LnPpopulation_{i,t} + \mu_{i,t}, \quad (2)$$

where $X_{i,t}$ stands for exports of services, $\text{PGDP}_{i,t}$, $\text{Ppopulation}_{i,t}$, and $\text{Pcrise}_{i,t}$ represent partners' trade-weighted GDP, population and crises respectively. The weight of each partner country in the exports of services is assumed to be the same as its weight in the exports of goods. This hypothesis can be justified by the fact that there is a similarity in the structure of trade of goods and trade of services, and is imposed by the lack of data.

The estimated coefficients on the different crisis dummies are shown in Table 4.

Table 4: Exports Following Crises: Pooled Panel Aggregate Gravity Estimates. 1980-2011

Dependent variable: log (exports of services) at level in year *t*		
	Currency Crises	Banking Crises
Exporter Crisis t	0.289* [0.187]	0.170 [0.129]
Exporter Crisis t-1	0.242 [0.162]	0.216 [0.241]
Exporter Crisis t-2	0.264* [0.167]	0.365** [0.142]
Exporter Crisis t-3	0.210 [0.139]	0.383*** [0.141]
Exporter Crisis t-4	0.251** [0.103]	0.219 [0.169]
Partner Crisis t	0.375 [0.296]	-0.103 [0.116]
Partner Crisis t-1	0.307 [0.193]	0.053 [0.144]
Partner Crisis t-2	0.254 [0.434]	0.094 [0.134]
Partner Crisis t-3	0.033 [0.162]	0.257 [0.221]
Partner Crisis t-4	0.043 [0.167]	0.015 [0.121]

[15]Except for Tunisia and Malta.

[16]Whereas Equation (1) puts equal weight on all trading partners, the aggregate version puts more weight on larger trading partners (Abiad *et al.*, 2011).

Table 4: Exports Following Crises: Pooled Panel Aggregate Gravity Estimates. 1980-2011: Continues

Dependent variable: log (exports of services) at level in year *t*		
	Currency Crises	Currency Crises
Log Exporter GDP	1.364*** [0.279]	1.207*** [0.268]
Log Partner GDP	0.066 [0.126]	0.077 [0.131]
Log Exporter Population	-0.157 [0.242]	-0.125 [0.230]
Log Partner Population	-0.368*** [0.091]	-0.302*** [0.074]
R-squared	0.928	0.927
Number of Observations	367	367
Exporter Dummies	Yes	Yes

Notes: This table shows the estimates from regression Equation (2) in the text. All reported coefficients are from the same regression.
The regression includes year and exporter dummies. Robust standard errors are in parentheses. Significance at the 1. 5 and 10 percent indicated by ***. ** and * respectively.

A currency crisis in the exporter country has a positive influence on the exports of services. It also seems that, after a banking crisis in the partner or in the exporter country and after a currency crisis in the partner country, exports of services do not deviate significantly from normal both in the short and medium terms.

VI. Conclusions

This paper examines empirically how financial crises affect the exports of goods and services of MENA countries. We contribute to the literature studying the impact of financial crises on international trade in two ways: to our knowledge, this is the first analysis conducted on MENA countries; it is also the first to study the impact of financial crises on services.

We estimate a gravitational model for unilateral trade for MENA countries over the period 1970-2011 and find that after currency and banking crises in partner countries exports of MENA countries decrease significantly by 21 percent and 28 percent respectively. This effect persists for 3 years after the onset of the banking crises and only for one after the currency crises. It should be noted that the negative impact of banking crises in partner countries was more pronounced in the case of manufactured goods than total exports, with an average drop of 33 percent in the year after a banking crisis and remaining at 20 percent below normal after 3 years.

However, exports of services of MENA countries were not as adversely affected by financial crises and their behavior can be explained by standard gravity determinants. We found only a competitive effect for the exports of manufactured goods viable for one year.

Exporter currency crises influenced the exports of services positively. It also seems that after banking crises in partner countries or in the exporter countries, and after currency crises in partner

countries, exports of services do not deviate significantly from normal both in the short and medium terms.

In sum, vulnerability of MENA economies to financial crises seems to be the least when we consider trade of services in comparison to trade of goods. This result cannot be ignored when considering development strategies. Thus, to further diversify their economies and exports, MENA countries should place trade in services at the core of their development strategies. This is particularly relevant for countries looking for reducing their excessive oil dependence.

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Appendices

Table A.1: Definitions of Variables

1. *Real Exports*[17] *of Goods* measured in millions of U.S. dollars, from *COMTRADE,* Deflated using CPI-US from *World Development Indicators*.
2. *Real Exports of Services*, measured in millions of U.S. dollars, from "Trade Map" which is a web-based application with statistics, trends and indicators on global trade flows and developed by the International Trade Center (ITC, Geneva), Deflated using CPI-US from *World Development Indicators*.
3. *Real Gross Domestic Product* is in millions of U.S. dollars constant prices (2005) and *Population* in thousands of inhabitants are from the World Bank's *World Development Indicators*.
4. *Distance, contiguity and colonial links* come from CEPII bilateral distance database (www.cepii.fr/anglaisgraph/bdd/distances.htm).
5. Episodes of financial crises come from Laeven and Valencia (2008 and 2010).

Table A.2: Summary Statistics of Main Variables

Variable	Nobs	Mean	St. Dev.	Min	Max
Currency crisis in exporter	29785	0.025	0.156	0	1
Currency crisis in partner	29785	0.015	0.122	0	1
Banking crisis in exporter	29785	0.011	0.104	0	1
Banking crisis in partner	29785	0.028	0.165	0	1
Twin crisis in exporter	29785	0.006	0.074	0	1
Twin crisis in partner	29785	0.007	0.083	0	1
Log Exports total	29785	4.973	3.544	-11.823	12.711
Log Exports of manufactured	26884	2.973	3.349	-11.823	12.569
Log Exporter GDP	24081	23.720	1.41	20.100	26.352
Log Partner GDP	28395	26.312	1.560	22.985	41.607
Log Exporter Population	29330	17.090	1.493	14.545	21.019
Log Partner Population	28986	15.521	1.550	11.594	18.229
Log Distance	29785	8.483	0.667	6.331	9.850
1 if Common Language	29785	0.058	0.234	0	1
1 if Common Border	29785	0.004	0.063	0	1
1 if Colonial Times	29785	0.033	0.179	0	1

[17]Exports from country *i* to country *j* are assimilated to the imports from country *j* to country *i*.

Table A.3a: Exports Following Currency Crises: Pooled Panel Gravity Estimates. 1970-2011

Dependent variable: log (exports) at level in year *t*	Currency Crises	Banking Crises
Exporter Crisis t	-0,013 [0,085]	0,076 [0,131]
Exporter Crisis t-1	0,050 [0,080]	0,134 [0,128]
Exporter Crisis t-2	-0,083 [0,088]	-0,064 [0,124]
Exporter Crisis t-3	0,009 [0,086]	0,023 [0,119]
Exporter Crisis t-4	-0,049 [0,087]	0,092 [0,117]
Partner Crisis t	-0,288** [0,145]	-0,082 [0,097]
Partner Crisis t-1	-0,093 [0,140]	-0,119 [0,090]
Partner Crisis t-2	-0,071 [0,135]	-0,095 [0,090]
Partner Crisis t-3	-0,035 [0,146]	0,106 [0,087]
Partner Crisis t-4	-0,007 [0,141]	0,057 [0,109]
Log Exporter GDP	2,008*** [0,133]	2,024*** [0,130]
Log Partner GDP	1,769*** [0,141]	1,768*** [0,144]
Log Exporter Population	-0,614*** [0,121]	2,096*** [0,319]
Log Partner Population	2,144*** [0,320]	-0,626*** [0,121]
Log Distance	-2,057*** [0,055]	-2,058*** [0,055]
Contiguity	1,019*** [0,169]	1,022*** [0,168]
Colony	0,626*** [0,066]	0,625*** [0,066]
Common language	0,492*** [0,070]	0,492*** [0,070]
R-squared	0.625	0.625
Number of Observations	16330	16330
Partner Dummies Exporter Dummies	Yes Yes	Yes Yes

Notes: This table shows the estimates from regression Equation (1) in the text. All reported coefficients are from the same regression. The regression includes year and partner-exporter dummies. Robust standard errors clustered at the partner-exporter pair level in parentheses. Significance at the 1, 5 and 10 percent indicated by ***, ** and * respectively.

Table A.3b: Exports Following Currency Crises: Pooled Panel Gravity Estimates. 1970-2011

Dependent variable: log (exports of manufactured) at level in year *t*	Currency Crises	Banking Crises
Exporter Crisis t	0.046 [0.089]	0.108 [0.135]
Exporter Crisis t-1	0.161** [0.086]	0.191 [0.136]
Exporter Crisis t-2	-0.012 [0.087]	0.110 [0.124]
Exporter Crisis t-3	0.044 [0.084]	0.218 [0.118]
Exporter Crisis t-4	-0.046 [0.089]	-0.057* [0.126]
Partner Crisis t	-0.211* [0.140]	-0.262*** [0.092]
Partner Crisis t-1	-0.032 [0.130]	-0.276*** [0.084]
Partner Crisis t-2	0.076 [0.126]	-0.276*** [0.084]
Partner Crisis t-3	0.029 [0.140]	-0.160* [0.089]
Partner Crisis t-4	0.070 [0.134]	-0.059 [0.103]
Log Exporter GDP	0.104 [0.134]	0.099 [0.130]
Log Partner GDP	1.654*** [0.151]	1.534*** [0.154]
Log Exporter Population	1.571*** [0.102]	1.666*** [0.340]
Log Partner Population	1.575*** [0.343]	1.561*** [0.102]
Log Distance	-1.504*** [0.053]	-1.505*** [0.053]
Contiguity	-0.773*** [0.257]	-0.783*** [0.257]
Colony	0.368*** [0.068]	0.367*** [0.067]
Common language	0.869*** [0.077]	0.870*** [0.077]
R-squared	0.686	0.687
Number of Observations	15575	15575
Partner Dummies Exporter Dummies	Yes Yes	Yes Yes