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Article

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Institutions, inward foreign direct investment, trade openness and credit level in emerging market economies☆

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Abstract

This study investigates the effects of institutional quality, inward FDI, trade openness, and their interaction on the domestic credit equilibrium in 33 emerging economies between 2002 and 2015. Through two system-GMM estimators, our study shows that inward FDIs have a booming effect on the domestic credit in emerging market economies while the trade openness exhibits a crowding-out effects. Institutions help moderating these effects of inward FDIs and trade openness on the domestic credit suggesting a particular policy.

JEL classification: E02; E44; E51; F15; F21

Keywords: Institutional quality; Inward FDI; Trade openness; Credit equilibrium

1. Introduction

The 2008 global financial crisis has strong effects on both advanced and emerging market economies (EMEs) although this crisis resulted from a failure of the credit markets in advanced economies (Coulibaly et al., 2013). There is a growing literature dealing with the importance of emerging markets. A high level of growth and a financial system in transition make these countries more and more interesting for scholars (see Auer (2016), Bamiatzi et al. (2016), Basher and Sadorsky (2016), Bello, et al. (2016), De Beule and Sels (2016), Kardes (2016), Kenç et al. (2016), Li and Oh (2016), Liu (2016), Lynch and Jin (2016), Meng (2016), Suh and Kim (2016), Williams and Lee (2016)).

Although EMEs have higher GDP growth rates than other countries in the world (including U.S), their credit markets are still in transition. Credits for private sectors to GDP in EMEs are much lower than the world (and U.S) EME's financial systems, especially banking system, have strong potential for growth in credit market that can support needs of high economic growth (see Agénor et al. (2012), Blomstrom et al. (1992), Chaudhuri et al. (2010), Croce et al. (2013), Driver and Muñoz-Bugarin (2010), Gong et al. (2012)).

The existing literature identified some main determinants of credit growth such as economic growth, inflation, and interest rate (Davis et al., 2016; De Lis et al., 2001; Elekdag and Han, 2015; Imran and Nishat, 2013; Jakubik and Moinescu, 2015; Kiss et al., 2006) but also trade openness and inward FDI capital flows (Aikman et al., 2015; Boustanifar, 2014; Coulibaly et al., 2013; Davis et al., 2016; Degryse et al., 2012; Elekdag and Han, 2015; Fauceglia, 2015; Gómez et al., 2014; Manova and Yu, 2016; Pyun and An, 2016; Wang et al., 2016; Yang, 2011).

The institutional economics explains the differences in economic growth between countries in terms of differences in human capital, physical capital, technological progress etc. (Acemoglu and Robinson, 2008; Branch, 2014; Busse and Hefeker, 2007; Duncan, 2014). Institutions can be defined as what determines the rules of the game in a society (North, 1990) impacting the economy through incentives by setting market rules or constraints on human behaviors (see Douglass Cecil

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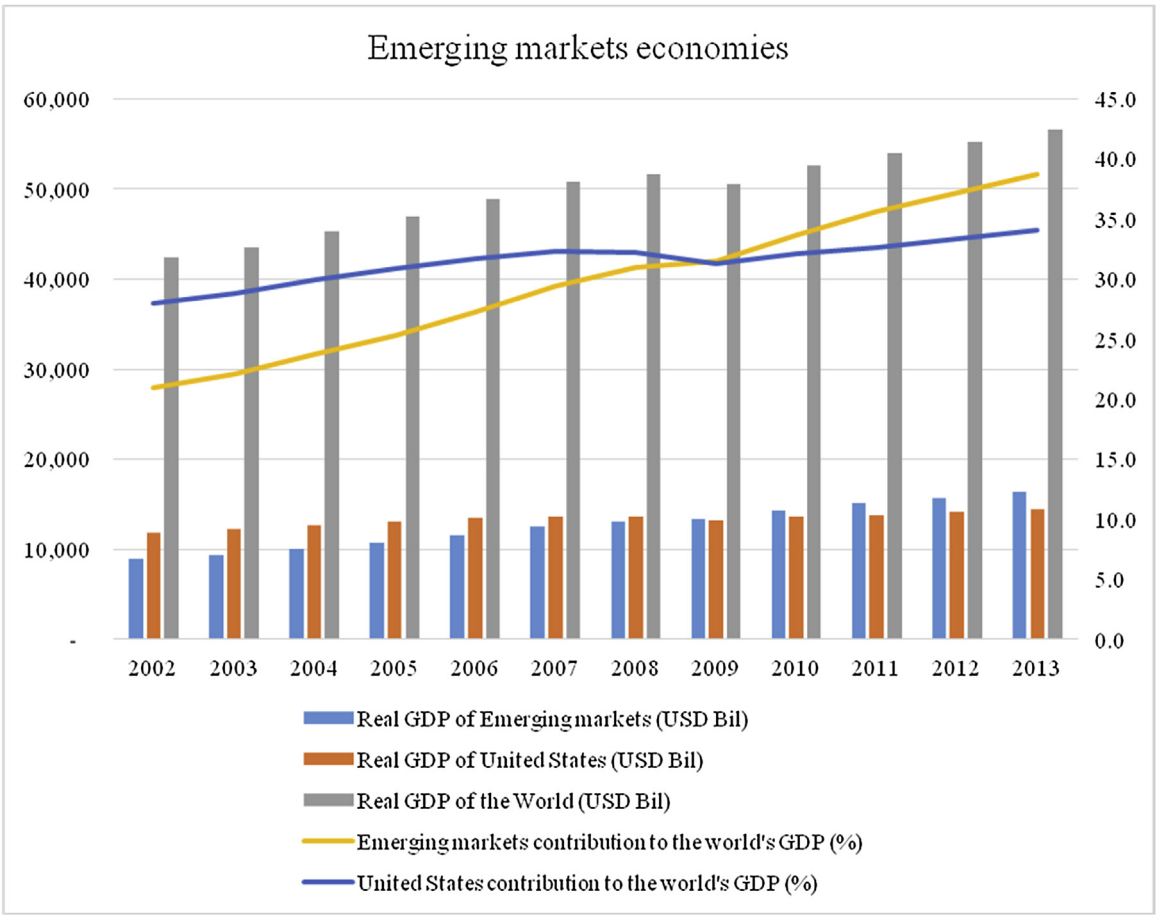

Fig. 1. Emerging market economies[1].

Source: Worldbank development indicators (2015).

North (1981), Acemoglu and Robinson (2008)). In this context, a better institutional quality can reduce economic problems such as the asymmetry of information, transaction costs, and risk by increasing market efficiency, asset allocations and property rights (Cohen et al., 1983; Ho and Michaely, 1988; Williamson, 1981). According to this literature, a better institutional quality generates better conditions for economic activities, and therefore for the credit market.

Numerous existing works studied about the domestic financial credit by focusing on what domestic banks and other financial institutions can offer; other studies rather investigated the effects of inward FDI and trade openness on domestic financial credit level. In the existing literature, the combined effects of institutional quality with inward FDI and trade openness are still under-investigated. The aim of this article is to investigate further the combined influence of institutional quality, inward FDI, and trade openness on the domestic credit level, while controlling other determinants such as economic growth, inflation, and interest rate in 33 EMEs for the period of 2002–2015 (see Table A1). We estimate the domestic credit through different proxies: the ratio of domestic credit for private sector by financial sector to GDP (including loans, trade credit and other kinds; the ratio of domestic credit for private sectors to GDP; the ratio of domestic credit for private sectors by banks to GDP).

This paper is organized as follows. The next section reviews the literature on the influences of institutional quality, inward FDI, and trade openness on the domestic credit level. The Section 3 presents our methodology and data in the third section while the fourth section presents and discusses our results (Figs. 1–5).

2. Literature review

This section is divided into three sub-parts, we first review the literature devoted to institutional quality on domestic credit level. The second sub-section reviews the main studies investigating the influence of inward FDI on domestic credit level.

[1] 37 emerging markets are counted in this sample including: Argentina, Bangladesh, Brazil, Bulgaria Chile, China, Colombia, Czech Republic, Egypt Arab Rep., Estonia, Greece, Hungary, India, Indonesia, Korea Rep., Latvia, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Oman, Pakistan, Peru, Philippines, Poland, Qatar, Romania, Russian Federation, Slovenia, South Africa, Thailand, Turkey, Ukraine, United Arab Emirates, Venezuela RB, and Vietnam. These countries are classified as emerging markets following the IMF, FTSE, and EM bond index of JP Morgan, see: http://www.imf.org/external/pubs/ft/weo/2015/02/pdf/text.pdf, http://www.ftse.com/products/downloads/FTSE-Country-Classification-Update_latest.pdf, https://markets.jpmorgan.com/#research.emerging_markets.index.

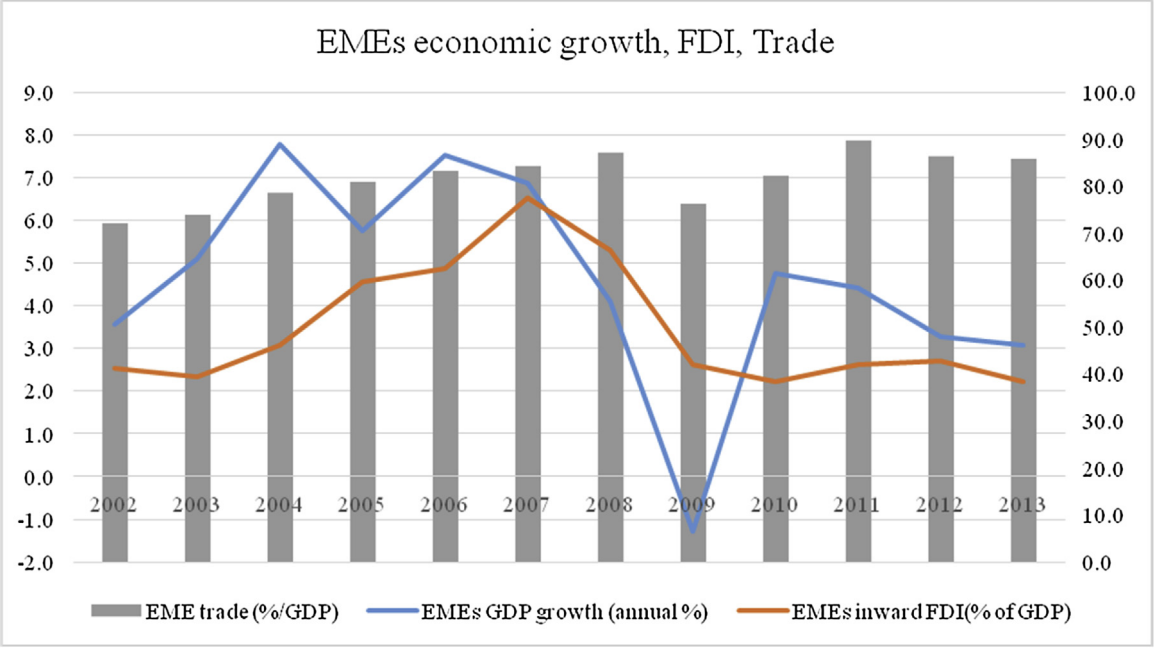

Fig. 2. Emerging market economic growth, inward FDI, trade.
Source: Worldbank development indicators (2015).

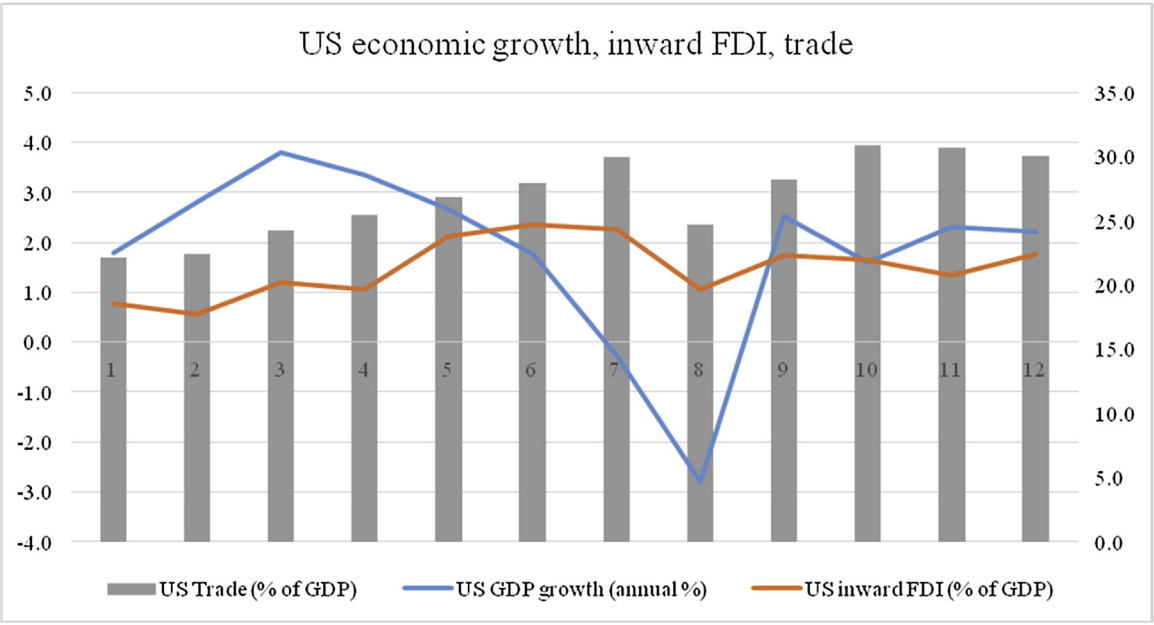

Fig. 3. US economic growth, inward FDI, trade.
Source: Worldbank development indicators (2015).

Finally, the last sub-section reviews the works dealing with the role of trade openness on domestic credit level.

2.1. Institutional quality and domestic credit level

Differences in terms of economic, social, and political structures between countries have been documented in many studies (see van der Burg (2000), Djankov et al. (2002), Radulovic (2005), Dequech (2006), Carmignani (2009), Pandey and Dong (2009), Kathavate and Mallik (2012), Zhang (2012), Perera and Lee (2013), Tsani (2013), Apergis and Payne (2014), Duncan (2014), Herrera-Echeverri et al. (2014), Wang et al. (2014), Valentinov et al. (2015), Demir (2016), etc.).

Institutional quality influences the incentives of banks and other financial institutions in expanding their credit activities by increasing credit supply. Institutional environment can also influence consumption and investment simulating therefore credit activities. Poor institutions such as a weak rule of law might, for instance, can create problems especially about

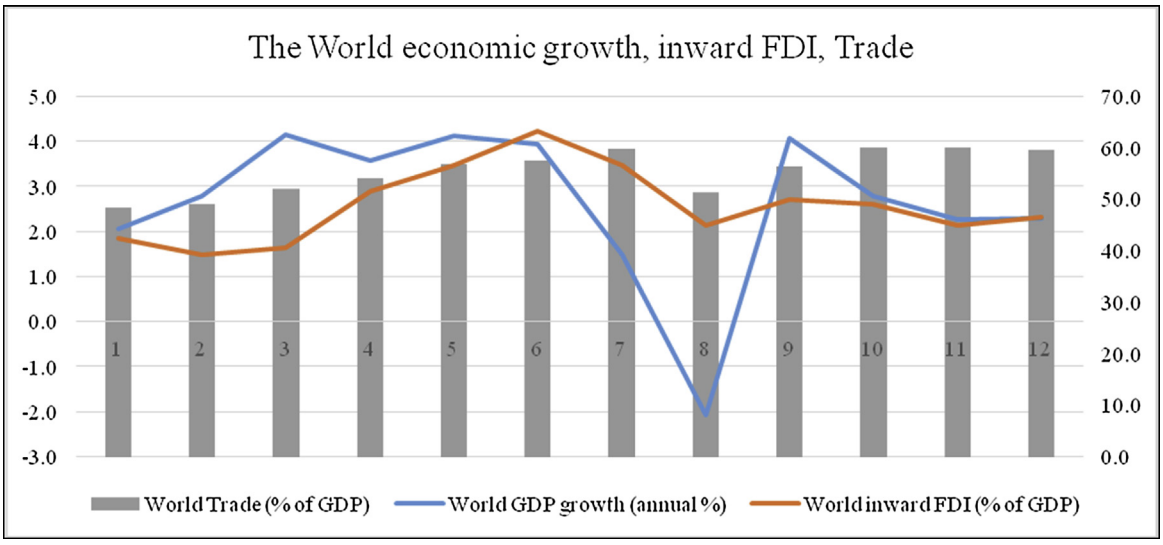

Fig. 4. The world economic growth, inward FDI, trade.

Source: Worldbank development indicator (2015).

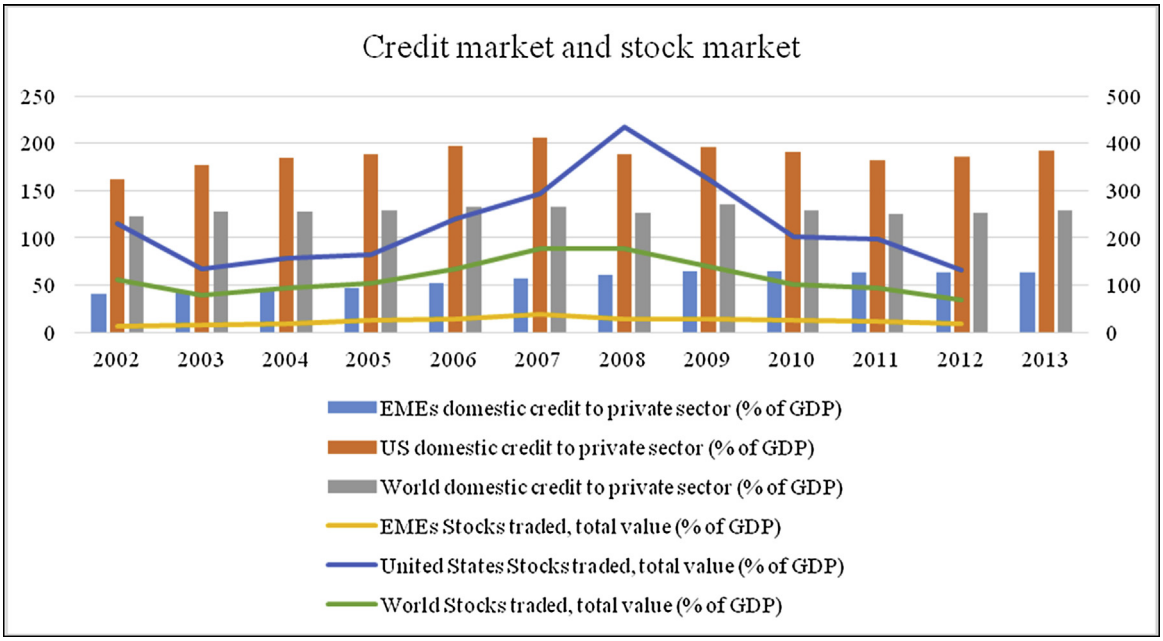

Fig. 5. Credit market and stock market.

Source: Worldbank development indicator (2015).

contractibility and information un-verifiability, which therefore generate asymmetry of information. This is one of the major issue in credit decision. In this context, it has been shown that because institutions reduce asymmetric information problems, they simulate banks and other financial institutions in expanding their credit supply (Boustanifar, 2014; Büyükkarabacak and Valev, 2012; Dell'Ariccia and Marquez, 2004; Doblas-Madrid and Minetti, 2013; Fosu, 2014). In the same vein, a better institutional quality reduces transaction cost (Hoffman et al., 2016), reduces risk (Busse and Hefeker, 2007; Hallerberg and Wolff, 2008), while it improves market efficiency (Chan et al., 2015; Dal Bó and Rossi, 2007; Fredriksson et al., 2004; Ho and Michaely, 1988; Park, 2012). La Porta et al. (1997), López de Silanes et al. (1998) showed that a higher transparency, a better legal system, and a better regulation contribute to a better transactional trust between contracting parties; and therefore, this situation encourages economic activities. A better institutional quality can also enhance competition policy in financial sectors (Delis, 2012; Fernández et al., 2010), which then induces banks (and other financial institutions) to increase their credit portfolio to support the market trend.

In the light of these existing works, we can expect that a better institutional quality will simulate the domestic financial credit at a country. An interesting question is to know if this influence would be higher in the case of emerging markets. Actually, the improvement of the institutional quality in EMEs might have

a higher marginal effect on the domestic financial credit than in the advanced countries because their economies are growing faster implying a higher credit demand. Furthermore, the EMEs' financial system is still in development meaning that these countries can benefit from economies of scale for expanding their credit portfolios larger and faster (Yu Wang et al. (2014). For instance, Ho et al. (2016) found that the improvement in country governance enhances the effectiveness of banks and then promotes economic growth in developing countries while it reduces these effects in developed countries due to smaller spaces for improvement.

2.2. Inward FDI and domestic credit level

Inward FDI capital flows play important roles in EMEs (Ahmed, 2012; Amal, 2016; Fadhil and Almsafir, 2015; Yao, 2006). Growing inward FDIs and their effects are analyzed in many empirical studies, which usually focus on the spillover effects in transferring technological from developed countries to developing countries (Ahmed, 2012; Fernandes and Paunov, 2012; Fujimori and Sato, 2015; Lin and Kwan, 2016; Newman et al., 2015; Silajdzic and Mehic, 2015). Of course, the influence of inward FDIs on the economic development plays an important role on the level of domestic credit.

By providing a higher level of capital, inward FDI have a positive influence on the economic growth (Pegkas, 2015), De Gregorio (1992), Blomstrom et al. (1992) in both developing and developed countries (see Borensztein et al. (1998) Campos and Kinoshita (2002); Chowdhury and Mavrotas (2006); Yao (2006); Bhandari et al. (2007); Yazdan and Hossein (2013); Omri (2014); Fadhil and Almsafir (2015); Boghean and State (2015), Pegkas (2015)). Consequently, a higher economic growth simulates the demand for credit and therefore, one can expect to see a positive relationship between inward FDIs and the level of domestic credit.

Such assumption is also supported by the fact that, through their technology spillover helping host countries inward FDIs indirectly contribute to an increase of the confidence of both banks and other financial institutions in expanding their credit activities. Moreover, a high level of inward FDI can also lead to inflation that then motivates firms to fund their capital by loans because real interest rates are lower in an inflationary environment (Fama and Gibbons, 1982; Madsen, 2003). However, a higher inflation can also have negative impact on credit, since nominal interest rate will increase in following the inflationary trend. This can therefore lead to a high interest rate situation in which private sector limit debts in capital structures. These negative effects of inward FDI might de-stimulate credit activities. In addition, the surging of inward FDI also leads to a big problem such as the appreciation of domestic currency. This issue is actually named as Dutch disease (Baharumshah, 2001; Bailey et al., 1987; Grobar, 1993; Onafowora, 2003; Xiangqian and Guoqiang, 2005). Such appreciation of domestic currency is harmful for trade balance and then economic growth which will reduce the financial credit due to the decreasing in both demand and supply credit.

Table A1
List of countries.

America (7)	Africa (5)	Asia (9)	European (12)
Argentina	Egypt, Arab Rep.	Bangladesh	Bulgaria
Brazil	Nigeria	China	Czech Republic
Chile	Oman	India	Estonia
Colombia	Qatar	Indonesia	Greece
Mexico	South Africa	Korea, Rep.	Hungary
Peru		Malaysia	Latvia
Venezuela, RB		Philippines	Lithuania
		Thailand	Poland
		Vietnam	Romania
			Russian Federation
			Slovenia
			Ukraine

Table A2
Definitions and sources of data.

Variable		Definitions	Sources
Dependent variable	Crefin	Domestic credit provided by financial sector (% of GDP)	WDI
	Crepri	Domestic credit to private sector (% of GDP)	WDI
	Crebank	Domestic credit to private sector by banks (% of GDP)	WDI
Control variables	GDPpc	Logarithm of real GDP per capita	Calculation from WDI
	GDPg	Real GDP growth rate (%)	WDI
	Inf	Inflation (GDP deflation index) (%)	WDI
	Int	Real interest rate (%)	WDI
	FDI	Foreign direct investment, net inflows (% of GDP)	WDI
Explanatory variables	Trade	Trade (% of GDP)	WDI
	Goveff	Government effectiveness index	WGI
	Requa	Regulatory quality index	WGI
	Law	Rule of law index	WGI
	Concor	Control of corruption index	WGI

To conclude, the existing literature on the topic usually emphasizes a positive effect of inward FDI on domestic credit level but when FDI generates an inflationary environment, they reduce the domestic credit level. Therefore, the impact of inward FDIs on domestic credit level depends on host countries macroeconomic factors (Furceri et al., 2012) such as their institutional quality indicators. We plan to investigate further this aspect in the following sections.

As stated, institutional quality has an impact on the asymmetric information problem, transaction costs, risk, market efficiency, and asset allocation (Cohen et al., 1983; Ho and Michaely, 1988; Williamson, 1981). In this perspective, institutions are also related to inward FDIs. Indeed, a lower asymmetric information, lower transaction costs or lower risk due to a better market efficiency asset allocation combines with higher inward FDIs will simulate business activities leading firms to change their productions and innovate. We can expect that institutional quality combined with inward FDIs will have a positive influence on the credit demand and therefore on the domestic credit level in general (Ali et al., 2010; Busse and Hefeker, 2007).

Table A3
Data description.

Variable	Obs	Mean	Std. Dev.	Min	Max
Crefin	485	72.620	42.592	0.230	215.026
Crepri	485	57.482	37.329	0.186	160.125
Crebank	487	53.503	33.044	0.186	170.233
GDPpc	491	8.887	0.996	6.283	11.194
GDPg	491	4.265	4.601	−14.814	33.736
Inf	491	6.923	9.077	−25.128	103.823
Int	483	4.718	9.108	−42.310	48.340
FDI	482	3.477	4.510	−16.071	50.742
Trade	490	83.489	41.761	21.124	210.374
Goveff	495	0.183	0.640	−1.290	1.280
Requa	495	0.233	0.740	−2.000	1.700
Law	495	0.020	0.745	−2.180	1.430
Concor	495	−0.100	0.676	−1.500	1.590

Source: author's calculation.

2.3. Trade openness and domestic credit level

Trade openness is an important macroeconomic factor that has been largely studied in relation to the existing literature on economic growth (Belloumi, 2014; Dollar and Kraay, 2003; El Khoury and Savvides, 2006; Eriș and Ulașan, 2013; Hakimi and Hamdi, 2016; Makki and Somwaru, 2004; Menyah et al., 2014; Musila and Yiheyis, 2015). Such studies usually acknowledge trade openness is also linked to financial development (Kim et al., 2010).

In this context, if trade openness has a positive influence on the economic growth then the credit demand might increase implying a higher domestic credit level. Precisely, trade openness increases the competitive pressure on domestic firms stimulating technological transfer and innovations (Sohag et al., 2015). A higher trade openness might also lead to a higher vulnerability, especially in developing countries (Montalbano, 2011). Kim et al. (2010), for instance, showed that, between 1960 and 2005, a positive long-run relationship between trade openness and financial development coexisted with a negative short-run relationship in 88 countries. However, when splitting the data into different income or inflation groups, these authors' findings is mainly observed in low-income countries (or high-inflation economies). Generally speaking, a higher trade openness may have a positive effect on the credit level of a country. In the case of emerging economies, a higher trade openness may increase the domestic credit level when the country has a high economic growth and an export-led strategy. Fetahi-Vehapi et al. (2015) found that trade openness is more beneficial to countries with higher level of initial income per capita. Another factor that might affect the productivity, Badinger (2008) found that differences in institutional quality and trade can have a sizeable effect on the productivity and huge variation in per capita income of countries. More generally, a better institutional quality creates better environment for businesses improving therefore competition with both positive and negative effects on the economy. If local firms are competitive, they can expand their activities and then increase the credit demand, however, in the case domestic firms are in trouble due to international competition and that they lose their market shares, the demand for credit can be reduced. In relation to institutions, one can see that a higher trade openness will increase the competitive pressure and the probability of failure for local firms (Belloumi, 2014).

3. Methodology and data

Our empirical study is structured in three steps. *First*, we utilize data from World development indicators (WDI) and World governance indicators (WGI) to investigate, for the period going from 2002 to 2015, the influence of the major parameters capturing institutional quality (*inqua*); (government effectiveness (*Goveff*); regulatory quality (*Requa*); rules of law (*Law*); and control of corruption (*Concor*)) on the domestic credit level in 33 emerging countries (EMEs). We also collect data related to the FDI net inflows (*FDI*) and the trade openness (*Trade*) on domestic credit level for 33 EMEs. Data definitions and sources are presented in the Table A2.

In our study, we control other determinants including the real GDP growth rate (*GDPg*), the logarithm of real GDP per capita (*GDPpc*), the GDP deflation rate (*Inf*), and the real interest rate (*Int*). Afterwards, we use the interaction terms between the institutional quality and inward FDI but also between the institutional variables and the trade openness to examine the combined effect between the former and the two latter on the domestic credit level. Finally, we investigate different types of domestic credit level through diverse indicators: the ratio of domestic credit by financial sector to GDP (*Credfin*), the ratio of domestic credit for private sector to GDP (*Crepri*), the ratio of domestic credit for private sector by banks to GDP (*Crebank*) to examine the difference responses of credit types to the influence of institutional quality, inward FDI and trade openness.

To study how a country's domestic credit level is related to the institutional quality, inward FDI and trade openness, we use a basic formal relationship suggested by Igan and Tan (2017) (with some modifications in the explanatory variables):

$$\begin{aligned} y_{it} &= \alpha_1 Inqua_{it} + \alpha_2 FDI_{it} + \alpha_3 Trade_{it} \\ &\quad + \beta_j X_{it} + \pi_i + \rho_t + \varepsilon_{it}\ y_{\mathrm{it}} \\ &= \alpha_1 Inqua_{\mathrm{it}} + \alpha_2 Fdingdp_{\mathrm{it}} + \alpha_3 Tradegdp_{\mathrm{it}} \\ &\quad + \beta_{\mathrm{j}} X_{\mathrm{it}} + \pi_{\mathrm{i}} + \rho_{\mathrm{t}} + \varepsilon_{\mathrm{it}} \end{aligned} \quad (1)$$

The subscripts i and t are presented for countries and years, respectively; y is the proxies of domestic credit level (we estimate this variable through different proxies: the ratio of domestic credit to GDP, the ratio of domestic credit for private sector and the ratio of domestic credit for private sector by banks to GDP); *FDI* is the ratio of net inward FDI to GDP; *Trade* is the ratio of total trade value to GDP; X is the vector of control variables including the logarithm of real GDP per capita (*GDPpc*), the real GDP growth rate (*GDPg*), the inflation (*Inf*), and the real interest rate (*Int*); π and ρ are country and year fixed effects respectively; α and β are parameters to be estimated; ε is the residual.

Economic growth increases expected incomes and profits, improving the financial conditions for the private sector to

Table A4
Correlation matrix.

Correlations (P-value)	Crefin	Crepri	Crebank	GDPpc	GDPg	Inf	Int	FDI	Trade	Goveff	Requa	Law	Concor
Crefin	1.000												
Crepri	0.945***	1.000											
	0.000												
Crebank	0.867***	0.933***	1.000										
	0.000	0.000											
GDPpc	0.117***	0.147***	0.169***	1.000									
	0.010	0.001	0.000										
GDPg	−0.133***	−0.106**	−0.084*	−0.163***	1.000								
	0.003	0.020	0.066	0.000									
Inf	−0.286***	−0.289***	−0.315***	−0.132***	0.044	1.000							
	0.000	0.000	0.000	0.003	0.333								
Int	0.068	−0.017	−0.008	−0.013	−0.150***	−0.565***	1.000						
	0.141	0.707	0.855	0.783	0.001	0.000							
FDI	-0.045	0.021	0.033	0.048	0.106**	0.021	-0.052	1.000					
	0.331	0.646	0.466	0.297	0.020	0.652	0.256						
Trade	0.176***	0.292***	0.362***	0.258***	−0.046	−0.219***	−0.193***	0.220***	1.000				
	0.000	0.000	0.000	0.000	0.308	0.000	0.000	0.000					
Goveff	0.417***	0.465***	0.475***	0.653***	-0.096**	−0.434***	−0.003	0.130***	0.546***	1.000			
	0.000	0.000	0.000	0.000	0.033	0.000	0.957	0.004	0.000				
Requa	0.228***	0.309***	0.303***	0.648***	−0.154***	−0.445***	0.092**	0.235***	0.477***	0.884***	1.000		
	0.000	0.000	0.000	0.000	0.001	0.000	0.043	0.000	0.000	0.000			
Law	0.342***	0.382***	0.406***	0.631***	−0.124***	−0.426***	0.038	0.167***	0.519***	0.928***	0.906***	1.000	
	0.000	0.000	0.000	0.000	0.006	0.000	0.400	0.000	0.000	0.000	0.000		
Concor	0.271***	0.312***	0.302***	0.703***	−0.051	−0.351***	0.062	0.195***	0.420***	0.894***	0.878***	0.925***	1.000
	0.000	0.000	0.000	0.000	0.262	0.000	0.174	0.000	0.000	0.000	0.000	0.000	

Note: *,**,*** denote significant levels at 10%, 5%, 1% respectively Source: author's calculations.

borrow more if such firms want to maintain a constant ratio between internal and external capital (Elekdag and Han (2015), Jakubik and Moinescu (2015)). However, economic growth also increases productivity leading private sectors to use more internal funds decreasing therefore the credit demand (Kiss et al., 2006). In other words, the total effect is still theoretically undefined and our empirical study aims at clarifying this aspect. We start our investigation by expecting that the recent low level of domestic credit in EMEs is going to increase in parallel with the growth of the real GDP per capita (Kiss et al., 2006) while the influence of interest rate and inflation is quite straightforward since they have both an effect on the demand and the supply side of domestic credit (Calza et al., 2003). Endogenous problem can be an important econometric issue in estimation since higher incomes require higher credit demand, but higher level of credit also simulate an increase in people income. In order to deal with endogeneity, we apply the system-GMM estimators for this study to solve this problem (Blundell and Bond, 1998; Roodman, 2006).

After estimating the Eq. (1), we investigate the interaction terms between the institutional quality with inward FDI and trade openness to examine their combined effect on the domestic credit level in 33 EMEs. We then apply these procedures for all four types of domestic credit that we consider. All data description is presented in the Table A3.

The data description shows that, generally speaking, EMEs have a high trade openness (average trade to GDP is over 83%), but this observation is quite different between countries (standard deviations is over 41%). These countries are obviously a destination for FDI capital flows in the period from 2002 to 2015 (average net inflows FDI is nearly 3.5%). In the meanwhile, their institutional quality varied at the average level, only the control of corruption has mean values below the nil (which are in the middle of institutional quality indicators) while the government effectiveness and regulatory quality, in contrast, appears a bit better. These observations indicate that EMEs have an increasing openness to the world, but, a still average institutional quality giving therefore a room for policy-maker to influence the domestic credit level through institutional reforms.

The average of domestic credit is over 72% GDP, while the domestic credit for private sector is over 57% meaning that a large portion of credit goes to the public sector in these EMEs. The domestic credit for private sector and domestic credit for private sector by banks are slightly the same implying that the banking system is dominant source for fund in these countries. The correlation matrix is also calculated and presented in the Table A4.

The results show a significant positive between institutional quality indicators and trade openness with the domestic credit levels of all types. This may indicate a strong positive influence of institutional quality and trade openness on domestic credit level at EMEs, while the inward FDI does not have significant correlations with four types of the domestic credit. The next section presents in more details all results and findings.

Table A5
Domestic credit by financial sectors.

Inde. Var: Crefin.	Institutional quality, FDI, Trade and credit: Domestic credit by financial sectors									
	No-institutional effect (1)		Government effectiveness (2)		Regulatory quality (3)		Rule of law (4)		Control of corruption (5)	
Crefin (−1)	0.975*** [0.013]		0.998*** [0.011]	1.005*** [0.014]	0.978*** [0.014]	0.977*** [0.023]	0.987*** [0.012]	0.990*** [0.018]	0.981*** [0.012]	0.987*** [0.016]
GDPpc	0.850*** [0.119]		0.782*** [0.125	0.871*** [0.243]	1.032*** [0.184]	1.162*** [0.333]	0.879*** [0.138]	0.866*** [0.250]	0.876*** [0.112]	0.934*** [0.193]
GDPg	−0.162** [0.074]		−0.149* [0.075]	−0.287*** [0.067]	−0.279*** [0.090]	−0.602*** [0.081]	−0.231*** [0.084]	−0.392*** [0.085]	−0.180** [0.072]	−0.244*** [0.067]
Inf	−0.335*** [0.037]		−0.426*** [0.073]	−0.471*** [0.108]	−0.450*** [0.074]	−0.557*** [0.122]	−0.451*** [0.062]	−0.537*** [0.106]	−0.395*** [0.045]	−0.436*** [0.063]
Int	−0.012 [0.039]		−0.092* [0.047]	−0.151** [0.065]	−0.118* [0.066]	−0.266*** [0.085]	−0.101* [0.053]	−0.129* [0.067]	−0.058 [0.043]	−0.084 [0.051]
FDI	0.533*** [0.158]		0.565*** [0.169]	1.738*** [0.326]	0.686*** [0.169]	2.624*** [0.306]	0.581*** [0.178]	1.749*** [0.306]	0.547*** [0.160]	0.879*** [0.183]
Trade	−0.029*** [0.009]		−0.026*** [0.007]	−0.077*** [0.016]	−0.025*** [0.005]	−0.070*** [0.013]	−0.025*** [0.006]	−0.056*** [0.013]	−0.031*** [0.007]	−0.045*** [0.008]
Inqua			−2.524*** [0.906]	−2.544 [1.585]	−3.368*** [0.924]	−2.627** [1.281]	−2.484*** [0.730]	−1.619 [1.534]	−1.428*** [0.476]	−0.552 [2.191]
Inqua*FDI				−1.961*** [0.350]		−1.859*** [0.283]		−1.519*** [0.311]		−0.931*** [0.193]
Inqua*Trade				0.073*** [0.019]		0.049*** [0.015]		0.042** [0.019]		0.021 [0.020]
N	431		431	431	431	431	431	431	431	431
No. of countries	33		33	33	33	33	33	33	33	33
No. of IVs	28		29	31	29	31	29	31	29	31
AR(2) test (p-value)	0.704		0.687	0.780	0.616	0.517	0.659	0.715	0.692	0.756
Hansen test (p-value)	0.153		0.242	0.405	0.238	0.264	0.216	0.381	0.206	0.318

Note: *, **, *** denote significant levels at 10%, 5%, 1% respectively Source: author's calculation.

Table A6
Domestic credit for private sectors.

Inde. Var: Crepri	Institutional quality, FDI, Trade and credit: Domestic credit for private sector								
	No-institutional effect	Government effectiveness		Regulatory quality		Rule of law		Control of corruption	
Crepri (−1)	0.954*** [0.011]	0.970*** [0.013]	0.928*** [0.010]	0.963*** [0.013]	0.914*** [0.015]	0.970*** [0.012]	0.939*** [0.016]	0.962*** [0.013]	0.934*** [0.016]
GDPpc	0.747*** [0.171]	0.691*** [0.188]	0.964*** [0.104]	0.722*** [0.188]	1.086*** [0.201]	0.621*** [0.187]	1.057*** [0.130]	0.625*** [0.189]	1.105*** [0.153]
GDPg	0.072*** [0.025]	0.098*** [0.032]	0.028 [0.032]	0.035 [0.040]	−0.199*** [0.054]	0.073** [0.036]	−0.053 [0.033]	0.053* [0.027]	0.005 [0.025]
Inf	−0.240*** [0.076]	−0.258*** [0.082]	−0.357*** [0.074]	−0.276*** [0.080]	−0.432*** [0.099]	−0.232*** [0.078]	−0.372*** [0.071]	−0.220*** [0.078]	−0.314*** [0.076]
Int	−0.119* [0.060]	−0.129* [0.071]	−0.193** [0.072]	−0.132* [0.077]	-0.273*** [0.066]	-0.114 [0.070]	-0.223*** [0.060]	-0.098 [0.071]	-0.227*** [0.060]
FDI	0.646*** [0.084]	0.653*** [0.109]	1.004*** [0.096]	0.730*** [0.115]	2.016*** [0.193]	0.711*** [0.111]	0.975*** [0.091]	0.705*** [0.101]	0.867*** [0.093]
Trade	−0.027*** [0.007]	−0.031*** [0.006]	−0.022* [0.012]	−0.026*** [0.006]	−0.034*** [0.006]	−0.028*** [0.005]	−0.031*** [0.009]	−0.025*** [0.006]	−0.035*** [0.007]
Inqua		−0.420 [0.471]	6.342*** [1.897]	−1.079** [0.521]	3.451* [1.791]	−0.510 [0.403]	3.883** [1.493]	−0.589* [0.313]	5.205*** [1.320]
Inqua*FDI			−1.134*** [0.140]		−1.507*** [0.167]		−0.782*** [0.111]		−0.984*** [0.124]
Inqua*Trade			−0.034** [0.016]		−0.009 [0.013]		−0.031** [0.014]		−0.031*** [0.011]
N	431	431	399	431	431	431	431	431	431
No. of countries	33	33	33	33	33	33	33	33	33
No. of IVs	28	29	31	29	31	29	31	29	31
AR(2) test (p-value)	0.534	0.534	0.106	0.483	0.650	0.482	0.795	0.479	0.722
Hansen test (p-value)	0.124	0.225	0.308	0.217	0.215	0.268	0.233	0.198	0.258

Note: *,**,*** denote significant levels at 10%, 5%, 1% respectively Source: author's calculation.

Table A7
Domestic credit for private sector by banks.

Inde. Var: Crebank	Institutional quality, FDI, Trade and credit: Domestic credit for private sector by banks								
	No-institutional effect	Government effectiveness		Regulatory quality		Rule of law		Control of corruption	
Crebank (−1)	0.965*** [0.013]	0.986*** [0.012]	0.946*** [0.010]	0.979*** [0.014]	0.955*** [0.022]	0.968*** [0.018]	0.923*** [0.016]	0.975*** [0.013]	0.947*** [0.015]
GDPpc	0.707*** [0.133]	0.680*** [0.164]	0.913*** [0.105]	0.695*** [0.164]	0.944*** [0.223]	1.113*** [0.306]	1.530*** [0.201]	0.654*** [0.145]	0.993*** [0.134]
GDPg	0.025 [0.031]	0.007 [0.037]	0.013 [0.047]	−0.030 [0.044]	−0.213*** [0.057]	−0.108 [0.077]	−0.151** [0.064]	−0.010 [0.038]	−0.046 [0.034]
Inf	−0.239*** [0.043]	−0.267*** [0.077]	−0.340*** [0.061]	−0.274*** [0.077]	−0.424*** [0.102]	−0.399*** [0.117]	−0.511*** [0.089]	−0.252*** [0.061]	−0.358*** [0.053]
Int	−0.127*** [0.036]	−0.160** [0.078]	−0.214** [0.086]	−0.151** [0.074]	−0.314*** [0.074]	−0.426** [0.178]	−0.563*** [0.140]	−0.138** [0.063]	−0.193*** [0.064]
FDI	0.450*** [0.079]	0.466*** [0.088]	0.820*** [0.117]	0.549*** [0.095]	2.239*** [0.292]	0.474*** [0.076]	0.951*** [0.118]	0.506*** [0.084]	0.760*** [0.123]
Trade	−0.026*** [0.005]	−0.030*** [0.004]	−0.028*** [0.007]	−0.028*** [0.005]	−0.061*** [0.008]	−0.037*** [0.006]	−0.042*** [0.010]	−0.027*** [0.005]	−0.033*** [0.006]
Inqua		−0.864* [0.506]	2.634** [1.232]	−1.187** [0.486]	−0.945 [1.154]	−0.988* [0.525]	4.794*** [0.823]	−0.743** [0.345]	2.901*** [0.918]
Inqua*FDI			−0.920*** [0.159]		−1.715*** [0.253]		−0.938*** [0.167]		−0.658*** [0.096]
Inqua*Trade			−0.008 [0.011]		0.043*** [0.010]		−0.031** [0.013]		−0.026*** [0.008]
N	432	432	432	432	432	400	400	432	432
No. of countries	33	33	33	33	33	33	33	33	33
No. of IVs	28	29	31	29	31	29	31	29	31
AR(2) test (p-value)	0.948	0.957	0.790	0.960	0.902	0.169	0.244	0.989	0.983
Hansen test (p-value)	0.247	0.319	0.237	0.316	0.262	0.205	0.139	0.243	0.156

Note: *,**,*** denote significant levels at 10%, 5%, 1% respectively Source: author's calculation.

4. Results and discussion

We present here the results related to the first type of domestic credit level which is the domestic credit by financial sectors.

The column (1) in the Table A5 is the results of baseline model without the influence of institutional quality while columns (2) to (5) present the impacts of institutional quality (government effectiveness, regulatory quality, rule of law, and control of corruption) and its combination with inward FDI and trade openness on the level of domestic credit by financial sectors.

The significant positive coefficients of logarithm of the real GDP per capita shows that a higher income per capita in the EMEs with the higher domestic credit level, which is consistence with previous empirical studies (Dell'Ariccia et al. (2015), Magud et al. (2014), and (Igan and Tan, 2017)). This result also shows that the economic development goes with the development of financial sectors in the EMEs where financial sector plays an important role to supply credit for economic activities (since their stock market capitalizations are still quite small in comparing to capital demand, Bekaert and Harvey, 2003; Yartey, 2008).

The significant negative coefficients of the real GDP growth rate in our results contrast with some previous studies such as Igan and Tan (2017), for instance, who studied this aspect in 33 countries regrouping advanced, emerging and developing ones. In our context focusing on emerging countries, a fast-economic growth increases the retained earnings in the balance sheet of firms indicating that private sector in EMEs are relying more on internal funds for expanding their activities. In addition, the economic growth also stimulates the development of stock markets whereas firms can use the fund with lower cost of capital.

The results also show a significant negative effect of the inflation on the domestic credit level meaning that a higher inflationary environment is more harmful for credit market in EMEs. This results are consistent with theory and previous empirical studies showing that a higher inflation leads private sector to use lower debt (Igan and Tan, 2017). The significant negative coefficient of the real interest rate indicates that the domestic credit level in EMEs decreases with the increasing in interest rate. Precisely, a higher interest rate means a higher cost of capital for private sectors explaining that firms have to cut down the borrowing after an increasing in real interest rate.

The significant positive coefficients of the inward FDI indicates a crowding-in effects of capital flows on domestic credit level in EMEs; which is consistent to the results in previous studies (Furceri et al. (2012), Igan and Tan (2017)). On this topic, Li and Liu (2005) found that FDI has a directly positive effect on the economic growth for countries having a better human capital and a lower technology gap with the developed countries.

The significant negative coefficients of the trade openness, in contrast, indicates a significant negative impact of the trade activities on domestic credit level in EMEs. Interestingly, the results contrast with some previous studies on this theme (Kim et al. (2010), Igan and Tan (2017)), but our results are consistent with other works (Zhang et al., 2015). The consistency in our estimators confirms the negative influence of trade openness on the domestic credit level takes the form of a crowding-out effect of trade on domestic credit or the domestic private sector.

The institutional quality (including government effectiveness, regulatory quality, rule of law, and control of corruption) has a significant negative impact on the domestic credit in EMEs. This observation is in opposition to our initial statement and the background theory according to which better institutions boost the development of credit market. However, these results can be explained under two aspects. First, better institutions reduce the asymmetric information, transaction cost, and risk, which then stimulate the development of the economy and the direct financial markets so that the private sector rely more on internal and alternate sources of fund. Second, better institutions also stimulate banks and indirect financial institutions diversify their asset portfolios through other investment vehicles other than concentrate their asset in credit only. As a result, better institutions reduce the domestic credit level in EMEs. Our results are new empirical evidences detailing the determinants of credit equilibrium.

The interaction terms between institutional quality with inward FDI and trade openness provide totally new and interesting evidences. The combination between the institutional quality and the inward FDI have a negative effect on the domestic credit level in EMEs, which, again, are not in line with our initial statement. However, these interesting results provide new empirical evidences for the literature of institutional economics. Concretely then, a higher inward FDI has a higher positive impact on the domestic credit level in countries with lower institutional quality. To put it in other words, the inward FDI is more likely stimulating the credit boom in EMEs with lower institutional quality. From another viewpoint, the negative impact of the interaction term between the institutional quality and the inward FDI means that institutions might reduce this booming effect of inward FDI on domestic credit. This observation is definitely useful and essential for policy makers in EMEs to control the vulnerability in financial systems. Meanwhile, the interaction terms between the institutional quality and the trade openness have a significant positive effect on the domestic credit level in the EMEs. This result is interesting since it means that the negative effect of the trade openness on the domestic credit can decrease if these countries have better institutions. In this case, institutions can reduce the crowding-out effects of the trade openness on the domestic economic factors. This finding is also very interesting for policy makers.

Based on these results, we continue applied some empirical analysis for other types of domestic credit level including the ratio of domestic credit for private sectors to GDP, the ratio of domestic credit for private sectors by banks to GDP. The results are presented in the Tables A6 and A7.

The Table A6 shows interesting results. On one hand, all variables have the same effect on the domestic credit for private sector level (except the real GDP growth rate and institutional quality when we put the interaction terms into model 7, 8, 9, 10). Precisely, the real GDP growth rate has a significant positive impact on the domestic credit for private sectors, which are consistent with the argument according to which economic growth stimulates private sector in investment so that their credit

demand increased. In the meanwhile, the institutions, when they are studied alone, have a negative effect on the domestic credit for private sectors, but it has a positive effect when they are studied in combination with the inward FDI and trade openness. The interaction term between institutions and inward FDI is still negative, while the interaction term between institutions and trade openness presents a negative effect (in opposition to the results in Table A5). These results show that a higher trade openness does not only crowding-out on the domestic credit; it has a higher crowding-out effect on the domestic credit for private sector in the case of better institutional quality. In summary, the institutions have positive impacts on the domestic credit for private sectors, but these effects are limited due to the crowding-out effects generated by the trade openness. These results indicate a difficult challenge for governments in EMEs reforming their financial sectors including banking systems and other financial institutions with the aim at stimulating the development of private sector. In fact, these findings are re-confirmed with the results in Table A7, where the domestic credit for private sectors by banks are used as the dependent variable.

These results are consistent with results in the case of domestic credit for private sector.

5. Conclusion

Our study provides interesting findings by clarifying the empirical impacts of the institutional quality on the domestic credit level, specially for emerging economies. The influence of the institutional quality on the domestic credit level is very important for policy makers in setting up macroeconomic policies for financial sectors, especially for banking system. Precisely, this study shows some empirical evidences on the heteroskedasticity responses of credit sectors (including public sectors and private sectors) to shocks in economic growth and inflation that is an essential information for policy makers in developing and stabilizing financial markets.

The main empirical evidences show that inward FDI and trade openness have opposite effects on domestic credit level at EMEs. The inward FDI generates a booming effect, while the trade openness creates a crowding-out effects. Notably, the combination between institutions with inward FDI and trade openness present interesting findings: the institutions seem to reduce the effect of the inward FDI and trade openness on the domestic credit. In other words, better institutions reduce the booming effect of inward FDI whereas it also reduces the crowding-out effects of trade openness.

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Appendix A.

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