

**Effect of personal transfers and exports on economic growth in Morocco:
Econometric analysis over the period 1975-2017.**

**Effet des transferts personnels et des exportations sur la croissance
économique au Maroc : Analyse économétrique sur la période 1975-2017**

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Abstract

This study aims to examine the effect of personal transfers and exports on economic growth in Morocco using the annual data for the period (1975-2017). To deduce the nature of this effect, we tested the stationarity of the variables and the cointegration between the variables according To the Johansen method. The cointegration test showed that there is only one cointegration relationship between the variables, which allows us to apply the error correction model. The error correction model estimation results show that the long-term relationship is more significant, and that GDP per capita responds positively to changes in exports and personal transfers. A 1% increase in personal transfers improves per capita GDP by 0,12%. Similarly, an increase in exports by one point of percentage of GDP produces an improvement in per capita GDP of 0,068%.

Keywords: Personal transfers; Export; economic growth.

Résumé :

Cette étude vise à examiner l'effet des transferts personnels et des exportations sur la croissance économique au Maroc en utilisant les données annuelles de la période (1975-2017). Pour déduire la nature de cet effet, on a testé la stationnarité des variables et la cointégration entre les variables selon la méthode de Johansen. Le test de cointégration a montré qu'il existe une seule relation de cointégration entre les variables, ce qui nous permet d'appliquer le modèle à correction d'erreur. Les résultats d'estimation de modèle à correction d'erreur montrent que la relation à long terme est plus significative, et que le PIB par habitant réagit positivement aux variations des exportations et des transferts personnels. Une augmentation de 1% des transferts personnels améliore le PIB par habitant de 0,12%. De même, une hausse des exportations d'un point de pourcentage de PIB produit une amélioration du PIB par habitant de 0,068%.

Mots clés : Transferts personnels ; Exportation ; croissance économique

Introduction

The current account is one of the components of the balance of payments. The latter summarizes the transactions ¹of a country with the rest of the world². It includes the goods and services account, the primary income account, the secondary income account³, the capital account and the financial account⁴.

This article discusses the effect of two components of the current account structure on economic growth. These are personal transfers⁵ and exports. These two components can have a positive effect on the current account balance, as they can also have a positive impact on the foreign assets of the countries of origin, since they constitute an important source of foreign exchange.

¹ The transactions recorded in the 6th edition of the Balance of Payments manual correspond to interactions between a resident unit and a non-resident unit acting in mutual agreement involving an exchange of securities or a transfer. The fifth edition of the Handbook defined the transaction as "an economic flow resulting from the transformation, exchange, transfer or extinction of an economic value".

² Blanchard, O et Cohen D (2010) Macroéconomie, 5^{ème} Ed Pearson Paris. P : 363

³ The balance of these first three accounts is called the current account balance.

⁴ FMI (2013) « Manuel de la balance des paiements et de la position extérieure globale », 6ème Ed, Washington, D.C. p : 9

⁵ Personal transfers are a secondary income sub-balance, they include all current cash transfers

Regarding personal transfers, they represent on average 7% of Moroccan GDP during the period 2000-2017. Its current value in 2017 is multiplied by 3,18 compared to the year 2000¹. These figures may only partially represent the reality of these flows since a large part does not go through the official channels². These transfers can reduce poverty, improve the standard of living. They also boost consumption and investment and accelerate economic growth.

As for the exports of goods and services, they have recorded a remarkable evolution, especially during the last four years, they went from 32,95% of the GDP in 2014 to 35,50% in 2017. This evolution has an effect without doubt on the account of current transactions, and thus on the economic activity in Morocco.

Hence the interest of these two components in the Moroccan current account and in order to answer our problematic, we analyze in this research a review of literature that deals with the relationship between these two variables and economic growth in the first point. In the second point, we present a descriptive analysis of the main variables of this study. The last section is devoted to econometric analysis using an error-correction model.

I. Theoretical and empirical review of the relationship between personal transfers, exports, and economic growth.

1.1 The effects of the transfer of funds ³"REMITTANCE"

Theoretical and empirical literature on the impact of remittances on economic growth does not lead to definitive and clear conclusions. This impact can be direct or indirect. Some research has shown that remittances have a moderate positive impact on long-term trends in macroeconomic growth⁴.

Others show that since remittances are not productively invested in large volumes, have not been able to contribute to greater economic growth, or their contribution remains low⁵. Some authors have concluded that the relationship between remittances and economic growth is

¹ Author's calculation from International Monetary Fund data.

² like the banks

³ The new IMF manual introduces the concept of personal transfers that includes all current transfers, see FMI (2013) « Manuel de la balance des paiements et de la position extérieure globale », 6ème Ed, Washington, D.C. p : 9

⁴ For example Glytsos, N.P. (2002), «The Role of Migrant Remittances in Developemnt: Evidence from Mediterranean Countries, » International Migration, Vol. 40, No. 1, pp. 1- 25

⁵ For example Rao B. Bhaskara and Hassan G. Mainul (2011), «A panel data analysis of the growth effects of remittances, » Economic Modelling vol. 28 pp. 701-709.

negative¹. Research shows that the growth capacity of remittances fluctuates for each country and over time. They can either advance or curb economic growth. Based on these results, the impact of remittances at the macro level is still unclear².

There are different channels through which remittances can positively or negatively affect economic growth. One group of empirical studies suggests a positive effect of workers' remittances on economic growth through increased consumption, savings and investment³. Indeed, a greater influx of workers' remittances into Africa would contribute to its long-term sustainable growth by increasing domestic savings, Loxley and Sackey(2008)⁴. De Luna Martínez (2005)⁵ considers that if remittances could be deposited in the formal sectors, they would be treated as formal savings, which, in turn, would increase growth through a formal investment.

Investment, productivity, employment and imports are also affected by funds sent from abroad. They contribute to the acceleration of investment, Glytsos (2002)⁶, and thanks to this investment, productivity and employment are increasing Leon-Ledesma and Piracha (2004)⁷.

A healthy institutional environment is crucial, as it improves the efficiency of investment, and consequently higher production Catrinescu and al (2006)⁸. Similarly, and assuming the hypothesis that financial development improves economic growth, Catrinescu and al (2006)⁹ find that remittances favor the development of the financial sector in developing countries, which promotes economic growth in these countries. . However, Rao and Hassan (2011)¹⁰ conclude that remittances have no direct effect but have a small indirect effect on economic growth.

¹ See Mansoor A., Quillin Br. (2007), « Migration and Remittances, Eastern Europe and the Former Soviet Union, World bank p:61.

² Chami R., Fullenkamp C., Jahjah S. (2005), « Are Immigrant Remittance Flows a Source of Capital for Development?, IMF Staff Papers, Vol. 52, No. 1, , pp. 55-81

³ For example : Aggarwal, R., Demirgüç-Kunt, A. and Peria, M.S.M. (2011), « Do Workers' Remittances Promote Financial Development? », Journal of Development Economic n 90 pp 255-264

⁴ Loxley, J. and H. Sackey. (2008). « Aid Effectiveness in Africa. » African Development Review, 20(2), 163-99.

⁵ De Luna Martinez, J. (2005). « Workers' Remittances to Developing Countries: A Survey with Central Banks on Selected Public Policy Issues. » World Bank Policy Research Working Paper, June, 3638.

⁶ Glytsos, N.P. (2002), « The Role of Migrant Remittances in Development: Evidence from Mediterranean Countries, » International Migration, Vol. 40, No. 1, pp. 1- 25.

⁷ León-Ledesma, M., and Piracha, M., (2004), « International Migration and the Role of Remittances in Eastern Europe, » International Migration. Vol. 42, issue 4, pp. 65-82

⁸ Catrinescu, N., Leon-Ledesma, M., Piracha, M., Quillin, B., (2006), « Remittances, Institutions and Economic Growth, » Institute for the study of labor (IZA Discussion Paper 2139).

⁹ Op cit

¹⁰ Rao B. Bhaskara and Hassan G. Mainul (2011), « A panel data analysis of the growth effects of remittances, » Economic Modelling vol. 28 pp. 701-709.

For the financial development channel, Giuliano and Ruiz-Arranz (2009)¹ confirmed that workers' remittances affect positively economic growth in less financially developed countries. On the contrary, Ahamada and Coulibaly (2011)² showed that, although the effect of financial development varies from one country to another, a high level of financial development helps remittances to have a high stabilizing effect on GDP growth.

Similarly, Nusrate Aziz and al (2015)³ concluded that in a financially developed economy remittances from workers play a slightly larger role in economic growth than foreign direct investment. Financial stability is also another channel for economic growth. The IMF study (2005)⁴ considers remittances as a stable source of income relative to other financial flows because they are offsetting and therefore counter-cyclical.

This effect could reduce the likelihood of financial crises. Bugamelli M., Paterno Fr., (2005)⁵ studied the relationship between remittances and the occurrence of financial crises. They argued that remittances are both stable and counter-cyclical and can help reduce the probability of current account reversal caused by an increase in external debt or a decrease in the stock of international reserves.

As a result, remittances increase financial stability in emerging markets and developing countries. It also appears that if the share of remittances in GDP is higher, the likelihood of reversal of the current account become lower. The authors find that when workers' remittances reach 3 or 4% of GDP, their contribution to financial stability becomes much stronger and sharper⁶.

Glytsos (2002)⁷ also reports that remittance-reliant economies become vulnerable to fluctuations in remittances and demonstrate a common inability to protect against the wrong turn in remittance flows. Ziesemer (2006)⁸, in his article, argues that remittances will affect

¹ Giuliano, Paola and Ruiz-Arranz, Marta (2009), «Remittances, Financial Development, and Growth, » Journal of Development Economics, Vol. 90, Issue 1, 144-152

² Ahamada, Ibrahim and Coulibaly, Dramane (2011), «How does financial development influence the impact of remittances on growth volatility? », Economic Modelling Vol. 28, pp. 2748–2760

³ M. Nusrate Aziz and al. (2005) «Migrant Workers' Remittances and Economic Growth: The Role of Financial Development,» Online at <https://mpira.ub.uni-muenchen.de/66992>

⁴ IMF (2005) « The World Economic Outlook » p. 73

⁵ Bugamelli M., Paterno Fr. (2005), « Do Workers' Remittances Reduce the Probability of Current Account Reversals? » World Bank Policy Research Working Paper 3766 p. 3-24.

⁶ Op.cit p 4

⁷ Glytsos N., (2002) «Dynamic Effects of Migrant Remittances on Growth: An Econometric Model with an Application to Mediterranean Countries, » Center of Planning and Economic Research No. 74,., p. 24.

⁸ Ziesemer, T. (2006). «Worker Remittances and Growth: The Physical and Human Capital Channel. » UNU-Merit Working Paper Series, United Nations University, 020.

growth not only by increasing investment but also by increasing the literacy rate. This has a positive impact on the growth rate of GDP per capita.

A second group of empirical studies suggests a negative impact of remittances on economic growth. These studies indicate that workers' remittances value the real exchange rate and reduce international competitiveness. It also reduces the participation of workers in the labor market. Lopez, Molina and Bussolo (2007)¹, Chowdhury and Rabbi (2014)², for example, suggest that remittances greatly value the beneficiary country's real exchange rate, ultimately reducing international competitiveness in the export sector.

Chami, Fullenkamp and Jahjah (2003)³ also develop and test a model that indicates that the transfer of funds is a non-profit compensatory transfer and therefore has a negative correlation with economic growth. Barajas and al (2009)⁴ suggest that although remittances have an undeniable effect on poverty reduction and consumption smoothing. They do not significantly affect economic growth.

1.2 Effects of exports:

The relationship between export growth and economic growth has long been an area of international economics and development that is the subject of much research. Based on basic economic theory, it can be suggested that export growth contributes first to economic growth through what is known as the multiplier effect of foreign trade (see Stolper, 1947)⁵. Analysis of such a multiplier states that, given the expenditure function, an export surplus will have an expansionary effect whose magnitude depends on the marginal propensity to import. The transfer of scarce resources from low-productivity domestic industries to higher-

¹ Lopez H., Molina L., Bussolo M., (2007) «Remittances and the Real Exchange Rate, » World Bank Policy Research Working Paper 4213

² Chowdhury, Mamta B. and Rabbi, Fazle (2014), «Workers' remittances and Dutch Disease in Bangladesh,» Journal of International Trade & Economic Development, Vol. 23 (4), pp. 455-475.

³ Chami, R., C. Fullenkamp, and S. Jahjah. (2003) «Are Immigrant Remittance Flows a Source of Capital for Development?» IMF Working Paper, International Monetary Fund, WP/03/189.

⁴ Barajas, A., Chami, R., Fullenkamp, C., Gapen, M., and Montiel, P. (2009), «Do Workers' Remittances Promote Economic Growth?,» IMF Working Paper, (WP/09/153).

⁵ Stolper, W.F., (1947). «The volume of foreign trade and the level of income.» Quarterly Journal of Economics 61 (2), 285 310

productivity export industries results in an increase in overall productivity and accelerates production growth.

Economic theory also suggests that a higher level of export could contribute to economic growth because export earnings are an important source of foreign exchange, which is crucial when domestic savings are insufficient to finance imports of goods. Export growth could also stimulate economic growth by expanding the effective size of market, which would result in substantial economies of scale that would accelerate capital formation and technical change¹.

The causal relationship between exports and economic growth can work both ways; a direct sense of exports to economic growth, and another reverse ranging from economic growth to export growth². Indeed, output growth triggers productivity growth, which in turn improves the international competitiveness of export products and accelerates export growth (Kaldor, 1967)³. This characteristic is understood in the new theory of trade as a process of cumulative causality in which the development of productive capacities and the growth of demand are mutually reinforcing⁴.

There is a voluminous empirical literature on the link between exports and economic growth, covering various aspects of this link in different countries, testing the hypothesis of economic growth caused by exports or vice versa. Using Granger's causality tests in an error-correction framework, Bahmani-Oskooee and Alse (1993)⁵ found evidence of two-way causality between exports and real economic growth, a result that was supported by Kugler and Dridi (1993)⁶.

Bahmani-Oskooee and Economidou (2009)⁷ concluded that export growth can cause economic growth in the least developed countries in the long run or vice versa, and that the

¹ See Reppas and Christopoulos (2005). « The export-output growth nexus: Evidence from African and Asian countries. » *Journal of Policy Modeling* Volume 27, Issue 8, Pages 929-940.

² This idea is often called the "growth-oriented export" hypothesis and assumes that the dynamics of national economic growth are more relevant to explaining export growth.

³ Kaldor, N., (1967). « Strategic Factors in Economic Development, » New York State School of Industrial and Labour Relations, Cornell University,

⁴ UNCTAD, (2010). « The Least Developed Countries Report 2010: Towards a New International Development Architecture for LDCs. » United Nations, Geneva and New York.

⁵ Bahmani-Oskooee, M., Alse, J., (1993). « Export growth and economic growth: an application of cointegration and error correction modelling. » *Journal of Developing Areas* 27, 535–542.

⁶ Kugler, P., Dridi, J., (1993). « Growth and exports in LDCs: a multivariate time series study. » *International Review of Economics and Business* 40, 759–767.

⁷ See Bahmani-Oskooee and Economidou (2009). « Export led growth vs. growth led exports: LDCs experience » *Journal of Developing Areas*, 2009, vol. 42, issue 2, 179-212

results are country-specific. Barbara.P, and Alberto R., (2012)¹ examined the causal relationship between exports, imports and real GDP in Italy using data from the years 1863 to 2004. The results suggest that import growth has caused GDP growth and that GDP is driving export growth. For the years 1914 to 1939, the authors concluded no long-term relationship between exports and economic growth as a result of the fall of Italian exports during the First World War and the collapse of world trade and Italian in the 1930s.

Ghirmay et al. (2001)² studied the relationship between exports and economic growth in nineteen developing countries using a multivariate causality analysis based on the error-correction model. Their results confirm the existence of a long-term relationship between the two variables in only twelve developing countries, as export promotion attracts investment and increases GDP in these countries.

Using a bivariate technique and quarterly data from 1976 to 2003, Mamun and Nath (2004)³ found long-term unidirectional causality between exports and economic growth in Bangladesh. Yao (2006)⁴ concluded that both exports and FDI have a positive effect on economic growth.

Titus O. Awokuse (2008)⁵ examined the causal relationship between exports, imports, and economic growth for Bulgaria, the Czech Republic and Poland in an integrated framework. He specified an increased production function that explicitly tests the effect of exports and imports on economic growth. Empirical results indicate a two-way causal relationship between exports and growth in Bulgaria.

II. Analysis of current account structure and economic growth in Morocco.

Morocco's current transactions, covering goods, services, revenues and current transfers, resulted in a deficit of 4,3 percent of GDP in 2016, rising to 3,6 percent of GDP in 2017. This is a result of an attenuation of the deficit of the balance of goods, and an improvement of

¹ Barbara Pistoiesi and Alberto Rinaldi (2012) «Exports, imports and growth New evidence on Italy: 1863–2004, » *Explorations in Economic History* 49, pp: 241–254

² Ghirmay, T., Grabowski, R., Sharma, S., (2001). «Exports, investment, efficiency and economic growth in LDCs: an empirical investigation. » *Applied Economics* 33 (6) 689–700.

³ Mamun, K.A., Nath, H.K., (2004). «Export-led growth in Bangladesh: a time series analysis. » *Applied Economics Letters* 12 (6) 361–364.

⁴ Yao, S., (2006). “On economic growth, FDI, and exports in China.” *Applied Economics* 38 (3) 339–351

⁵ Titus O. Awokuse (2008) Causality between exports, imports, and economic growth: Evidence from transition economies, *Economics Letters* N° 94, pp 389–395

current transfers. In this section, we will describe the evolution of the structure of the current account including the evolution of exports and personal transfers, and economic growth in Morocco.

2.1. Evolution of goods and services balances and secondary income:

The trade balance is considered an indicator of good or bad economic health. The commercial transactions of Morocco with the outside are shown in the following table:

Table 1: Evolution of Balance of Goods and Services as % of GDP :

Year	Balance of goods	Balance of Goods and Services	Balance of Services
2000	-10,79	-5,39	5,40
2001	-9,72	-2,82	6,91
2002	-9,77	-2,64	7,13
2003	-10,89	-3,32	7,57
2004	-13,07	-5,41	7,65
2005	-15,03	-6,34	8,69
2006	-16,53	-6,47	10,06
2007	-20,33	-9,39	10,94
2008	-23,13	-13,81	9,32
2009	-20,30	-11,76	8,54
2010	-18,58	-10,68	7,90
2011	-21,10	-13,87	7,23
2012	-22,27	-14,93	7,34
2013	-20,21	-13,86	6,35
2014	-19,16	-12,46	6,70
2015	-14,60	-7,88	6,72
2016	-17,10	-10,56	6,54
2017	-16,64	-9,80	6,84

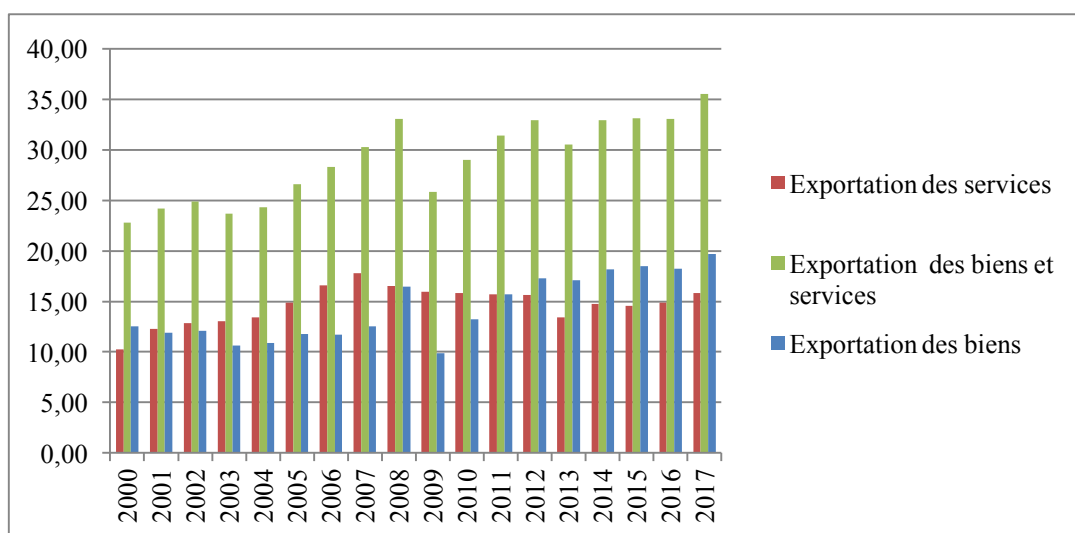
Source: World Bank based on balance of payments data

The analysis of the table shows a balance of goods and services deficit throughout the period 2000 to 2017. It went from 5,39% in 2000 to 9,8% in 2017. This change is due to the worsening of the balance property from a deficit of 10,79% in 2000 to 16,64% in 2017, despite the fact that the balance of services is still in surplus during the same period. The balance of services rose from 5,4% of GDP in 2000 to 6,84% of GDP in 2017. This performance is mainly due to travel receipts which reached 71,9 billion dirhams, an increase of 11,9% in 2017.

Compared to the year 2016, the situation of the balance of goods in 2017 was marked by a notable improvement especially in terms of exports of phosphates and derivatives and by a performance of the automobile sector.

For a global vision, the following graph shows the share of exports to GDP during the period 2000-2017:

Graph1: Evolution of exports of goods and services as a% of GDP during the period 2000-2017



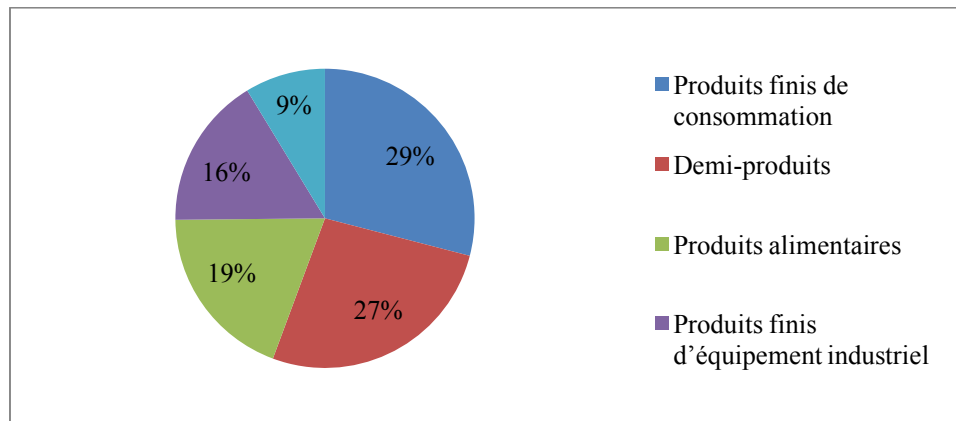
Source: IFM (BOPSY)¹, and author's calculation

The overall analysis of exports shows a decrease of 33% of GDP in 2008 to 25,83% in 2009. On the other hand, we note in 2017 an improvement of the exports which had 35,30% of the GDP. This improvement is mainly due to improved exports of goods, which rose from 9,89% of GDP in 2009 to 19,68% of GDP in 2017.

The analysis of the structure of exports by group of use, on average between 2008 and 2017, shows that they are composed, mainly, of finished products of consumption (27,7%), semi-finished products (25,4%). %, food products (18,3%), finished products of industrial equipment (15,7%), followed by raw products of mineral origin (8,3%).

¹ Updated on 18/10/2018.

Graph 2: Exports structure by user group, average between 2008 and 2017.



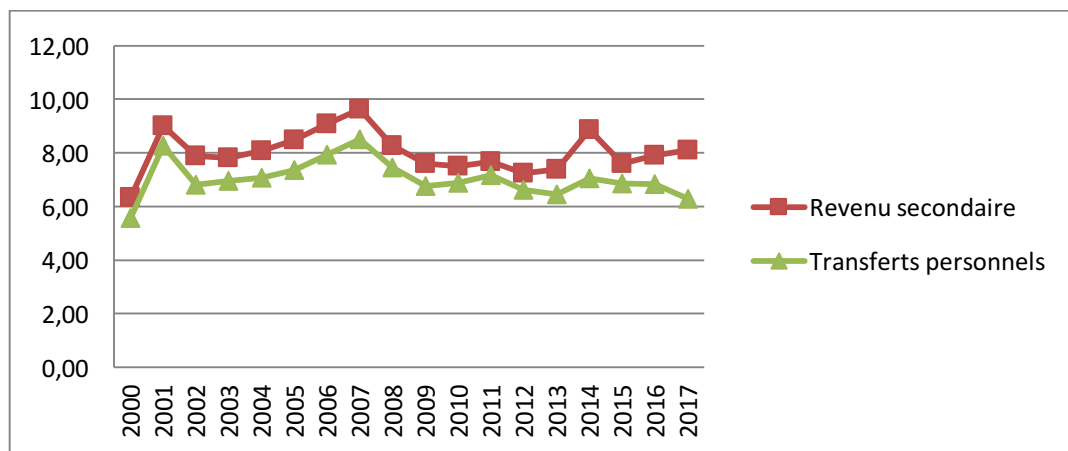
Source : MEF (2018), Tableau de bord macroéconomique 2017

According to the MEF¹ report, the dynamics of exports remain below the increased import requirements of the national economy, and that of global demand addressed to Morocco, not allowing a significant improvement in our global market share, which stabilized around 0,12%.

As for the secondary income balance, it contributed to the attenuation of the current account deficit, from 6,32% of GDP in 2000 to 8,10% of GDP in 2017. The share of personal transfers in the secondary income rose from 87,96% in 2000 to 77,40% in 2017.

¹ MEF(2018), Tableau de bord macroéconomique 2017

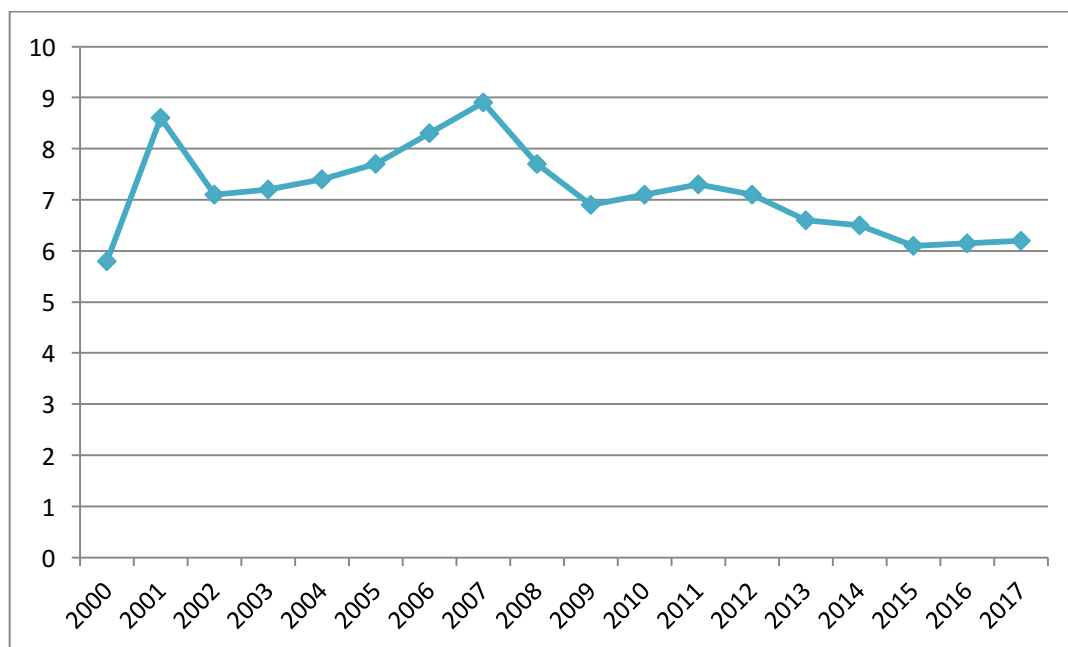
Graph 3: Evolution of the secondary income balance and personal transfers as% of GDP.



Source: IMF data and author's calculations

The improvement in the secondary income balance comes mainly from private transfers, which accounted for a large part of MRE revenues, which stood at 6,2% of GDP in 2017.

Chart 4: Evolution of MRE revenues as% of GDP



Source: MEF

2.2 Analysis of economic growth

Economic growth in Morocco has gone through three distinct phases:

Phase 1: the 1960s and 1970s

Plans for the 1960s (1960-1964, 1965-1967) included the development of agriculture and the establishment of a basic industry, through state intervention to consolidate independence. country's economy and to value its national resources.

During the 1970s, Morocco experienced an acceleration of its growth rate to reach 5,4% average annual growth. This period was marked by the implementation of economic and social development plans aimed at strengthening the economic fabric and supporting the social transformations of the country. The 1970s were also characterized by strong state intervention aimed at two main objectives, the establishment of an import substitution policy and the promotion of exports. The first axis of intervention was marked by consequent public investments associated with a system of protection of the nascent Moroccan industry. The second axis of intervention aimed at promoting exports (quinquennial plan 1973-1977). In this perspective, the State has tried to mobilize private initiative, notably through the promulgation of the Moroccanization law (1973).

However, the objective of boosting growth through a greater contribution from external demand has not been achieved, as the share of exports in GDP has remained unchanged since the 1960s.

- Phase 2: The 1980s and 1990s

The macroeconomic situation in Morocco deteriorated sharply in the early 1980s. To cope with this situation, the government put in place a structural adjustment program (SAP). This period was marked by high volatility of economic growth compared to the previous period, due to frequent droughts.

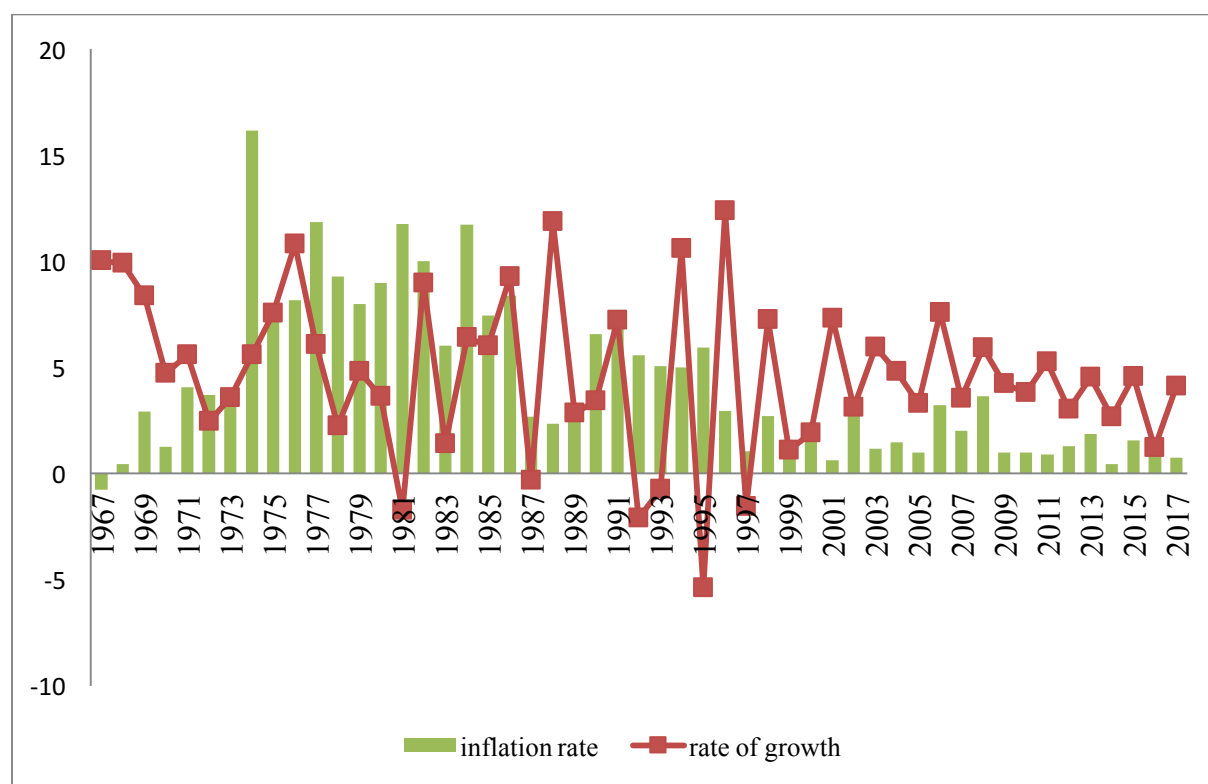
As a result, fluctuations in agricultural activity have repercussions on the national economy as a whole, given the ripple effect it has on income as a whole. The sharp slowdown in growth is also due to the decline in public and private investment, the slowing of foreign and mainly European demand for Morocco and the decline in the relative competitiveness of Moroccan exports compared to other emerging countries.

Growth slowed steadily, averaging 2,4% in the 1990s, and its volatility increased sharply following numerous external shocks (oil shock, lower phosphate prices, higher interest rates, drought).

- Phase3: the 2000s

This phase represents a relatively steady growth cycle. Growth has strengthened and stabilized at around 4,26% on average during the period 2000-2017, from 5,92% in 2008 to 1,2% in 2016 to stabilize at 4,1% in 2017.

Graph 5: Evolution of the rate of inflation and the rate of economic growth in Morocco between 1967 and 2017

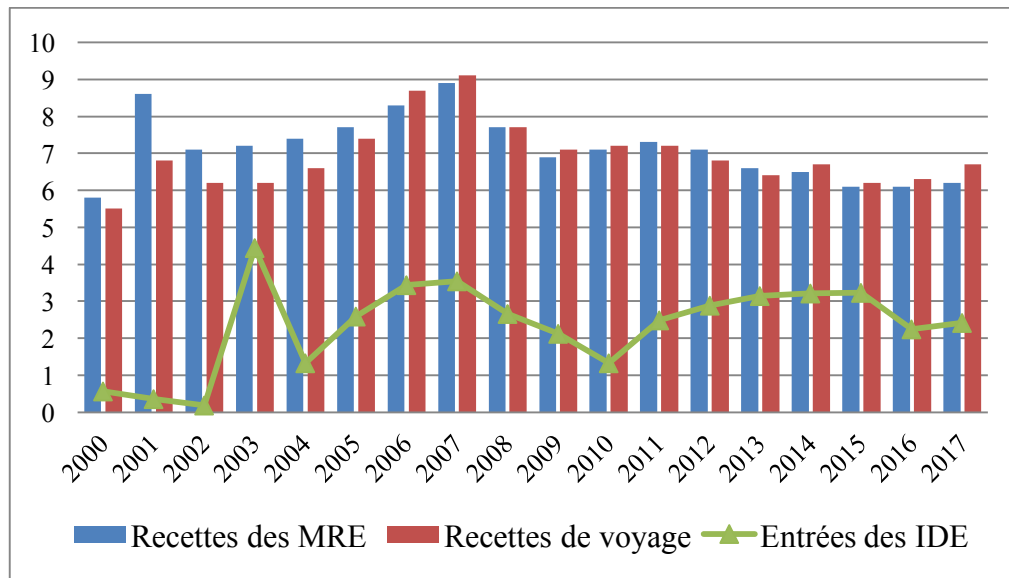


Source: World Bank (WDI)

This period is characterized by a recovery in public and private investment, the consolidation of non-agricultural GDP and an improvement in external balances, allowing the strengthening

of official foreign exchange reserves. The acceleration of growth recorded by Morocco in the early 2000s had three key characteristics. In the first place, Morocco benefited from a favorable international situation. The dynamism of the global economy has resulted in strong growth in FDI and remittances.

Graph 6: Income from Moroccans living abroad, travel receipts and inflows of FDI (as% of GDP)



Source : MEF

Foreign direct investment (FDI), mainly in the real estate and tourism sectors, boosted the growth momentum after the end of the investment wave in the textile sector in the first half of the 1990s. In the same way, the sharp rise in migrant remittances as a share of GDP also favored the growth of domestic demand, through investment and consumption. Finally, the development of tourism from Europe and off-shore services has supported Morocco's exports.

Secondly, credit to the private sector has experienced exceptional growth since 2005. Credit growth, combined with the rise in FDI, has notably resulted in a significant increase in investment and household consumption. Finally, globally, since the beginning of the 2000s, the evolution of economic policy has resulted in a growth regime geared to the internal factors of demand. The current value of national final consumption increased from 79,8% of GDP in 2000 to 75,3% of GDP in 2008. Household consumption as a percentage of GDP increased from 61.4% in 2000 to 58,1% of GDP in 2008.

Gross fixed capital formation declined at the end of 2017, it recorded a growth rate of 3,4% against 9,32% in 2016. The total investment reached 346,5 billion in 2017 and its ratio to GDP remained at 32,6%¹.

National savings registered a rate of 28,9% of GDP in 2017, a year-over-year rate of 0,5 percentage point, compared to 24,3% of GDP in 2000. The need The financing of the economy stood at 39,6 billion or 3,7% of GDP in 2017.

III. Econometric analysis :

The purpose of this study is to help identify the effect of personal transfers and exports of goods and services on economic growth in Morocco using annual IMF and World Bank data from 1975 to 2017.

Before identifying this effect, we present the signs of the relationships between personal transfers and transmission channels of their effect on economic growth²

Table 2: Relationship Between Personal Transfers and Transmission Channels

Canals	Measure	Coefficient de détermination	Signe de relation
Financial development	Domestic credit provided to the private sector by banks (millions of dollars)	$R^2 = 0,937$	Positive
	Domestic credit provided to the private sector (in millions of dollars)	$R^2 = 0,937$	Positive
Saving	Gross domestic savings (in millions of dollars)	$R^2 = 0,966$	Positive
Investissement en capital	Gross fixed capital formation (in millions of dollars)	$R^2 = 0,972$	Positive
Household consumption	Household final consumption expenditure (in millions of dollars)	$R^2 = 0,961$	Positive

Source: prepared by the authors

¹ Rapport de Bank Al Maghrib 2017, p 36.

² See the graphs in Annex 1.

The results in this table show a strong relationship between personal transfers and transmission channels, this relationship is positive with all these channels.

To estimate the effect of personal transfers and exports on growth in Morocco, the following variables are used:

GDP: The log of gross domestic product per capita: it is a measure of economic growth

C: the constant

PT: Balance of personal transfers as % of GDP

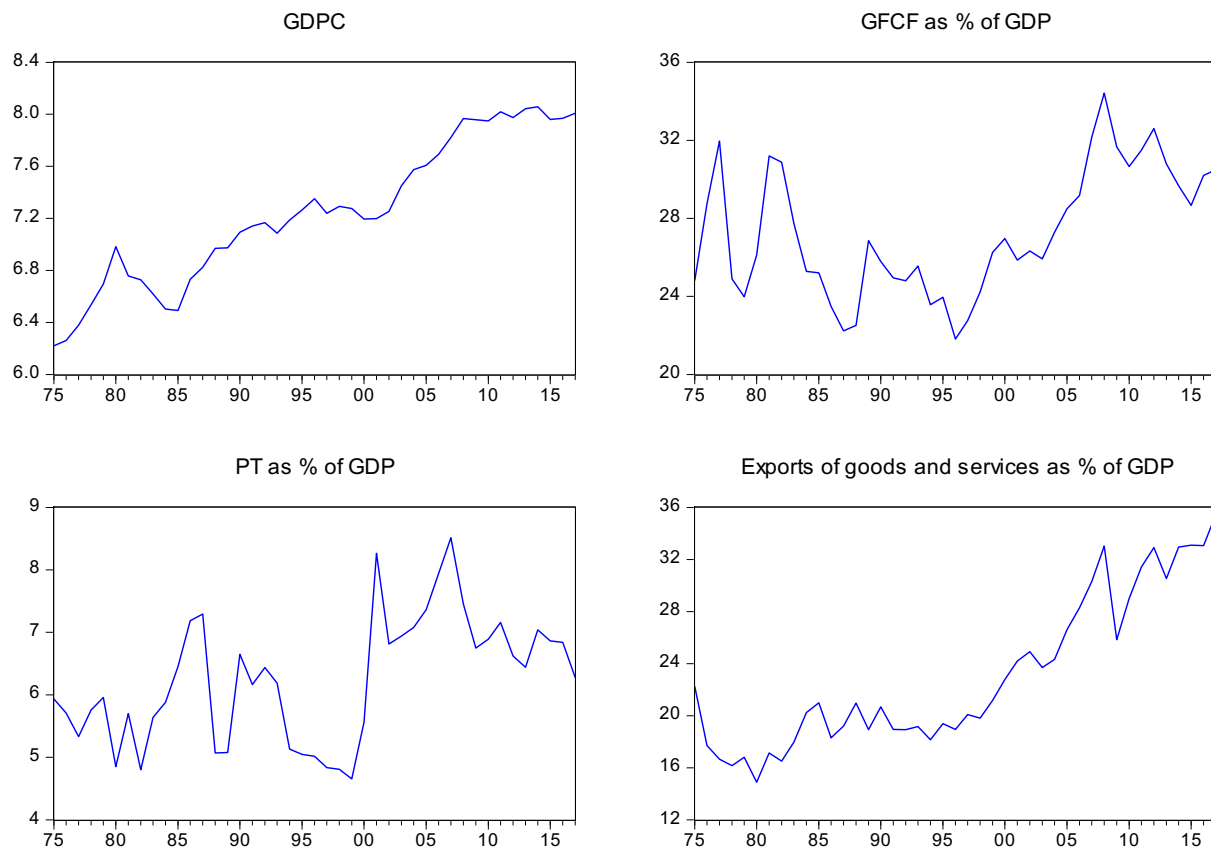
GFCF: Gross fixed capital formation as % of GDP

EX: Exports of goods and services as % of GDP

μ : the error term.

L'évolution de chaque variable de cette étude est présentée dans le graphique suivant :

Graph 7: Evolution of variables



To achieve the objective of this study we will start with an analysis of the correlation between the variables, then the test of their stationarity, and finally the cointegration test.

3.1 Correlation Analysis:

The success of the model estimates results depends on the study of the normality of the variables. The analysis of normality is done by the test of normality of Jarque-Bera.

The hypotheses of this test are:

- H_0 : the data follow the normal law.
- H_1 : the data do not follow the normal distribution

If the probability associated with the test is less than 5%. We reject the hypothesis of

normality. On the other hand, if the probability associated with the test is greater than 5%, H_0 is not rejected.

Table 3: Descriptive Statistics and JB Test

	PT	GPDC	GFCF	EX
Mean	6,241168	7,243512	27,26556	23,07667
Median	6,273904	7,198016	26,32858	20,95881
Maximum	8,515134	8,058407	34,41717	35,49942
Minimum	4,655324	6,219685	21,81302	14,87791
Std. Dev.	0,999404	0,550552	3,273131	5,876243
Skewness	0,19924	-0,029188	0,271645	0,668558
Kurtosis	2,282591	1,935452	2,009482	2,113833
Jarque-Bera	1,20662	2,036535	2,286683	4,610268
Probability	0,546998	0,36122	0,318752	0,099745
Sum	268,3702	311,471	1172,419	992,2968
Sum Sq. Dev.	41,94991	12,73053	449,9624	1450,27
Observations	43	43	43	43

From the J-B test performed on Eviews, we find that the majority of the variables follow the normal one, which allows the estimation of the econometric model by the Ordinary Lesser Square (OLS) method.

3.2 Stationarity of the variables:

We applied the Augmented Dicky-Fuller test (at the 5% threshold), the results are summarized in the following table:

Table 4: Stationarity Test Results

Variables	In level			first difference		
	t-stat	Critical value	Stationarity	t-stat	Critical value	Stationarity
GDPC	-2,42	-3,52	Non	-5,27	-3,52	Oui
PT	-2,81	-2,93	Non	-7,22	-2,93	Oui
GFCF	-2,46	-2,93	Non	-6,90	-2,93	Oui
EX	-2,53	-3,52	Non	-6,46	-3,52	Oui

From the analysis of the table, it appears that the variables: GDPC, PT, GFCF, and EX are stationary in first difference. Thus, the condition of integration of all the series of the same order is verified and the hypothesis according to which there exists at least one cointegration relation between the variables is retained

3.3: Johansen cointegration test

One of the most important steps that precedes Johansen's multivariate cointegration test is finding the optimal number of delays. This step allowed us to deduce a number of delays of 2 (see annex). We will proceed to the cointegration test under the following hypothesis:

- Existence of a constant in the long term relation and not in the data (no constancy in the error correction model)

Model	H ₀	H ₁	Trace Staistic		Max-Eigen Statistic	Critical Value at 5%
NO TREND	r = 0	r > 0	56,58	54,07	25,85	28,58
	r ≤ 1	r > 1	30,73	35,19	14,90	22,29

Table 5: Johansen Test Results

According to the table, the Trace test validates the existence of a single cointegration relation, whereas the test of the maximum eigenvalue does not validate the existence of this cointegration relation (see appendix). So, based on the first test, we accept a single cointegration relation.

We did not include a linear trend in the data and we forced the constant term to appear only in the long term relationship. The cointegration relationship is as follows:

$$\text{LGDP} = 4,60 + 0,12\text{PT} + 0,027\text{GFCF} + 0,068\text{EX}$$

(0,90) (0,16) (0,027) (0,027)

Note: Numbers in parentheses are standard deviations.

According to this equation the real PT, GFCF, and EX are related to the LGDPC by a long-term equilibrium relationship. The coefficients associated with these variables are statistically significant. The cointegrating equation notes that the GDPC reacts positively to the increase of the three independent variables, but the effect remains minimal. In the long term, a 1% increase in personal transfers improved per capita GDP by 0,12%. Similarly, an increase in exports by one percentage point of GDP improved per capita GDP per capita by 0,068%.

3.4: Model estimation with error correction

We will take into account the specification where we constrained the constant term to appear only in the long term relationship. So, the estimation of our model gives the following equation:

$$D(GDPC) = -0,11 (GDPC (-1) - 0,12PT(-1) - 0,027GFCF(-1) - 0,068EX(-1) - 4,60) + 0,136D(GDPC (-1)) + 0,022D(GDPC (-2)) + 0,011D(PT(-1)) + 0,009D(PT(-2)) + 0,003D(GFCF (-1)) - 0,012D(GFCF (-2)) - 0,010D(EX(-1)) - 0,006D(EX(-2)).$$

The estimated equation satisfies the requirements for the correct operation of an error correction model. Indeed, the writing of the error correction model is correct. We have a short-term dynamic augmented by a recall term corresponding to the delayed cointegration relation of a period. The term of callback to equilibrium is equal to -0.11, it is negative and significant¹.

In the short term, the coefficients related to all the variables are not significant, the effect on the GDPC is low or almost nil. The sign of variable D (GDPC (-1)) is positive, so we have a good sign in the short-term relationship.

¹ See annex

Conclusion:

This work was conducted to model the effect of the current account structure, including personal transfers and exports, on economic growth in Morocco using annual data for the period 1975-2017. The objective is to determine the degree of the effect of each variable, and to know if there is a cointegration relationship between the variables.

The modeling was carried out therefore using the multi-varied techniques of cointegration. The results show that the long-term effect of personal transfers and exports on economic growth in Morocco is positive and significant, but it remains weaker. The short-term relationship shows that the GDPC is sensitive only to its positive change from the previous year.

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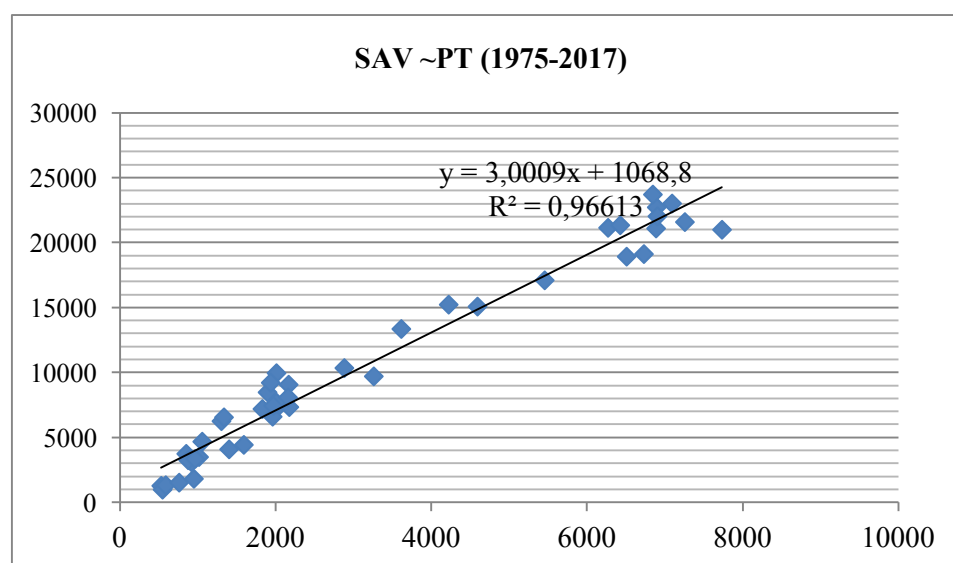
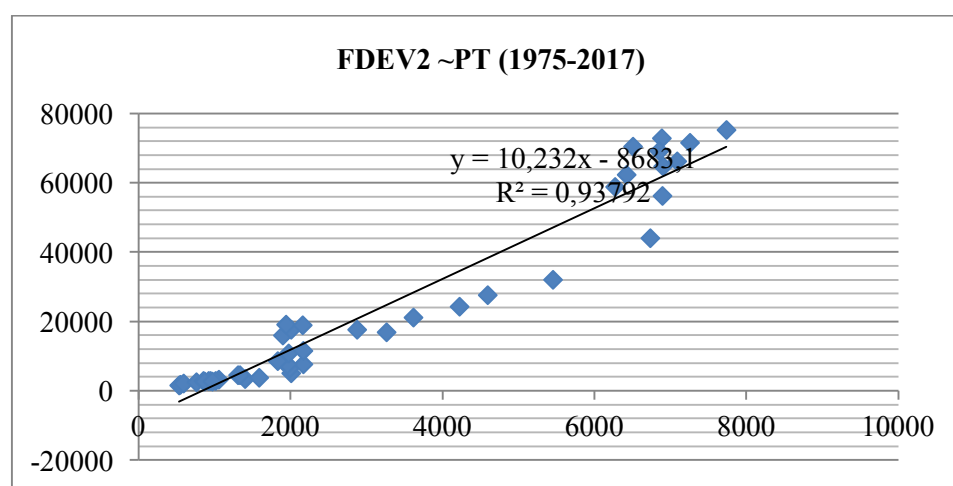
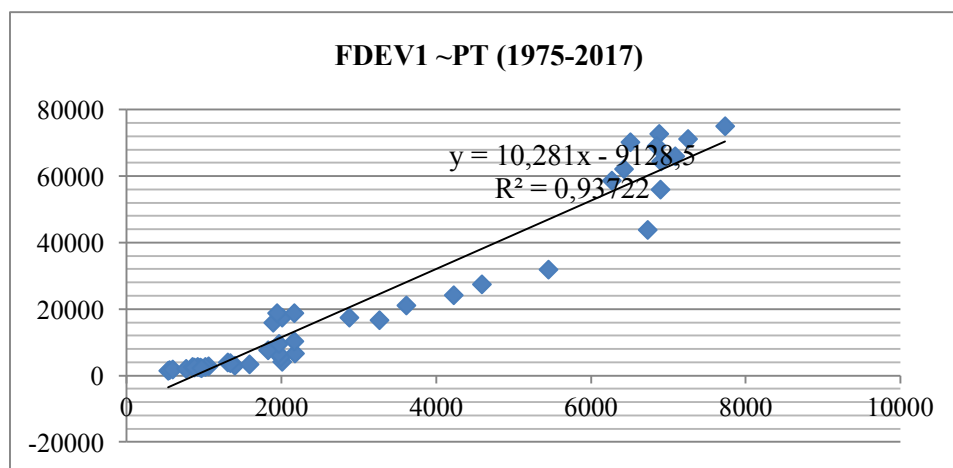
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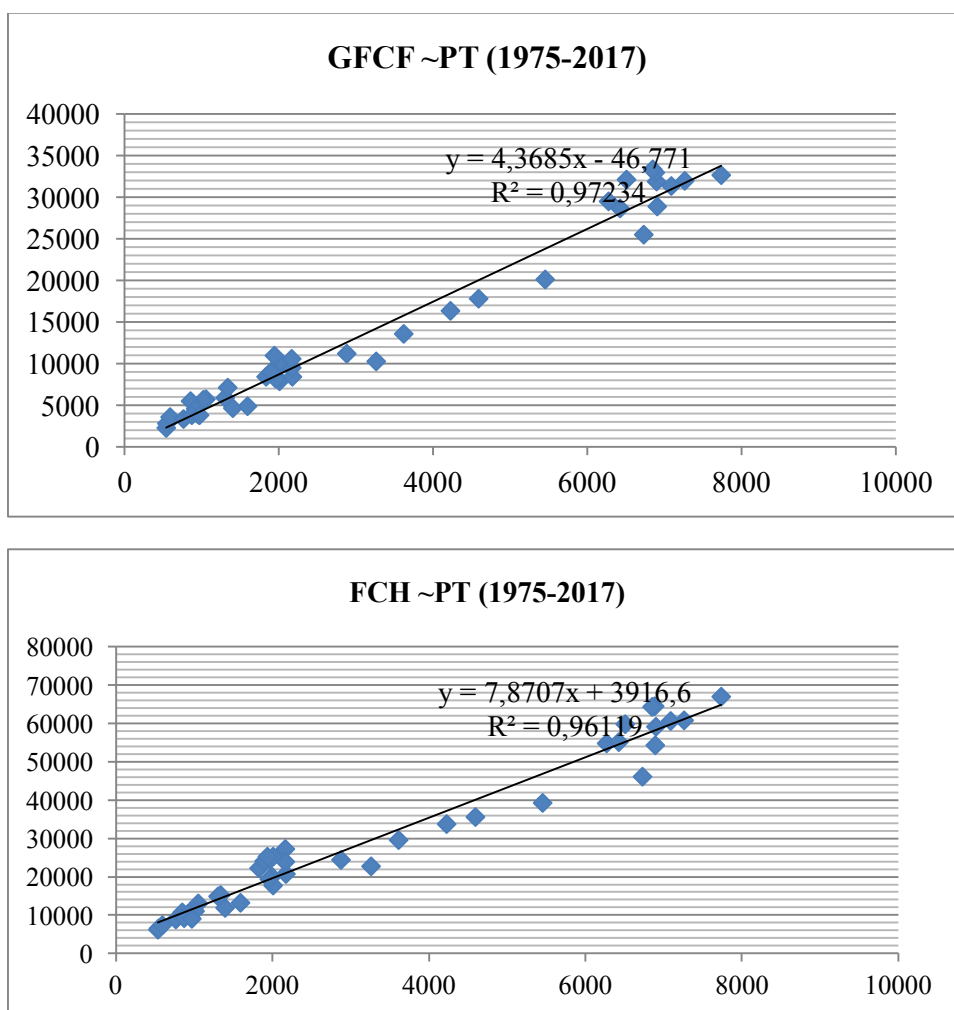
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Annexs

Annex1 : relation entre les variables (les valeurs en millions de dollars USD)





Source: World Bank WDI (2018) and author's calculations

Annex 2: Determination of number of lag

VAR Lag Order Selection Criteria

Endogenous variables: PIBH TPER FBCF EX

Exogenous variables: C

Sample: 1975 2017

Included observations: 39

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-323.6544	NA	233.0668	16.80279	16.97341	16.86401
1	-221.9424	177.3440	2.890614	12.40730	13.26041*	12.71339
2	-198.2913	36.38636*	2.008300*	12.01494*	13.55053	12.56589*
3	-192.0761	8.286936	3.564894	12.51672	14.73480	13.31255
4	-173.5103	20.94593	3.609953	12.38515	15.28571	13.42584

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Annex 3: Results of cointegration test

Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.476034	56.58433	54.07904	0.0294
At most 1	0.311152	30.73121	35.19275	0.1400
At most 2	0.274141	15.82184	20.26184	0.1829
At most 3	0.072392	3.005848	9.164546	0.5796

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.476034	25.85312	28.58808	0.1074
At most 1	0.311152	14.90938	22.29962	0.3825
At most 2	0.274141	12.81599	15.89210	0.1435
At most 3	0.072392	3.005848	9.164546	0.5796

Max-eigenvalue test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**Mackinnon-Haug-Michelis (1999) p-values

Annex 4 : significance of estimates:

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.116820	0.038405	-3.041765	0.0048
C(2)	0.136712	0.160949	0.849415	0.4022
C(3)	0.022413	0.164739	0.136054	0.8927
C(4)	0.011096	0.021868	0.507429	0.6154
C(5)	0.009623	0.022417	0.429287	0.6707
C(6)	0.003077	0.008210	0.374835	0.7103
C(7)	-0.012656	0.007474	-1.693284	0.1004
C(8)	-0.010517	0.010413	-1.009996	0.3203
C(9)	-0.006135	0.008586	-0.714494	0.4803
R-squared	0.277734	Mean dependent var		0.040729
Adjusted R-squared	0.091343	S.D. dependent var		0.104470
S.E. of regression	0.099585	Akaike info criterion		-1.580512
Sum squared resid	0.307429	Schwarz criterion		-1.200514
Log likelihood	40.61024	Hannan-Quinn criter.		-1.443117
Durbin-Watson stat	1.830391			