

Tax Obligations and Foreign Direct Investment: New Evidence from sub-Saharan Africa

Francis K. Andoh
Department of Applied Economics
School of Economics,
University of Cape Coast, Ghana
fandoh@ucc.edu.gh

&

William G. Cantah
Department of Data Science and Economic Policy
School of Economics,
University of Cape Coast, Ghana
William.cantah@ucc.edu.gh

Abstract

Using data on a panel of 36 countries in sub-Saharan Africa from 2005 to 2016 and employing dynamic system GMM regression approach with random effects, this study examines the extent to which tax obligations (number of taxes required to be paid by an investor, time involved in the payment of taxes, and the proportion of the profits paid as tax) impact on FDI stock in Africa. The findings show a significant negative impact of all measures of tax obligations. However, the effect of number of taxes and the time it takes to honour tax obligations were found to have greater negative impact. The negative effect of profit tax was found to be diluted by greater levels of output and natural resources. Efforts to reduce the number of taxes as well as the time it takes to honour tax obligation are key for SSA economies to maintain levels stock of FDI. Also, economies with lower levels of natural resources should work to increase productivity to reduce adverse effect of profit tax on the stock of FDI.

1. Background

It is well documented that foreign direct investment (FDI) contributes immensely to higher economic growth (Hansen & Rand, 2006; Chowdhury & Mavrotas, 2006; Alfaro, Chanda, Kalemli-Ozcan, & Sayek, 2004; OECD, 2002). Despite these documented benefits FDI flow to Africa has declined over the last decade, contrasting with the trends observed in developing countries. For example, between the period 2002 and 2012, total FDI inflows to developing countries increased from \$172.3 billion to \$729.5 billion, thus an increase of about 323.4 percent (UNCTAD, 2006, 2014). The share of South East Asia alone increased by 10 percent in 2002 to 16 percent in 2012, however, that of Africa decreased from 8.5 percent in 2002 to 7.6 percent over the same period (UNCTAD, 2006, 2014). In absolute terms, FDI flows to Africa stood at \$72.179 billion in 2008, decreasing to \$58.565 billion in 2009, and further to \$55.2 billion in 2012 (UNCTAD, 2010)(UNCTAD, 2006, 2014). The latest World Investment Report shows developing Asia's share in global FDI increased from 25 per cent in 2016 to 33.3 percent in 2017, regaining its position as the largest FDI recipient region. On the contrary, FDI flows to Africa declined by 21.5 percent from \$53 billion in 2016 to \$42 billion in 2017. FDI flows to Africa constitutes just about 2.9 percent of global FDI inflows compared to developed economies (49.8 percent), developing Asia (33.3 percent), and Latin America and the Caribbean (10.6 percent) (United Nations Conference on Trade and Development(UNCTAD), 2018).

The falling trends in FDI flows to Africa raises an important question of what attracts and retains FDI? The eclectic paradigm (also known as the OLI framework) developed by Dunning (2002; Dunning, 2000, Dunning, 1979) explains that as profit maximizers, multinational corporations are driven by three key advantages: ownership, locational and Internalisation advantages (OLI). A foreign firm has ownership advantage (O) if it possesses some innovative technology for production that other firms cannot imitate and that market power or cost advantage provided by this ownership must exceed the disadvantages of doing business abroad. Per the internalization advantage, in the event of high costs of outsourcing production and distribution and also completing contracts, it makes economic sense for firms to keep the international expansion within the firm. So in this case, the MNEs may reduce cost through internalisation i.e. by acquiring the firm (instead of licensing product to foreign firms) in order to exploit the product or process internally within the firm.

The second paradigm, which is very critical for the context of Africa, explains that investors are attracted to countries that offer location-specific advantages (L). This paradigm has generated further theoretical discourse, which seeks to provide a distinction between horizontal and vertical motivation of FDI. Horizontal FDI arises when a firm locates a plant in a foreign country so as to access the foreign market. Replicating domestic production activities in the foreign country gives a proximity advantages in the form of reduced or no trade cost to the foreign market. (Brainard,1997, Markusen,1984). In contrast, vertical FDI, which is based on the factor proportion approach developed by Helpman (1984) and Helpman and Krugman (1985), explains that firms geographically locate in different countries based on international factor price differences so as to reduce their production costs. These lower production costs are driven by the availability of resource endowments, institutional and governance qualities, infrastructure as well as economic factors such as market size, cheap raw materials, low wages (firms locate unskilled labour-intensive activities are located in countries with relatively cheap labour) and investor friendly tax regimes. The knowledge-capital (KC) model developed by Markusen, Venables, Eby-Konan & Zhang (1996); Markusen (1997; 2002) which has become the most articulate model of bilateral foreign direct investment (FDI) establishes that both horizontal and vertical motivations emerge simultaneously to determine the direction of FDI.

Studies on FDI in developing countries have focused on wide range of FDI determinants such as have institutional factors like bureaucracy, corruption, legal institutions ((Bénassy-Quéré, Coupet, & Mayer, 2007). Others factors implicated include country risk, unit labour costs and host market size (Bevan & Estrin, 2000; Frenkel, Funke, & Stadtmann, 2004), institutions, agglomeration and trade openness (Kinoshita & Campos, 2003), corruption and weak government enforcement of contracts (Gastanaga, Nugent, & Pashamova, 1998); (Campos, Lien, & Pradhan, 1999; Asiedu & Villamil, 2000; Wei, 2000) and macroeconomic stability, human capital, infrastructure development, natural resource availability and political instability (see Cleeve, 2012; Ofori-Brobbe & Ojode, 2009; Busse & Hefeker, 2007; Asiedu, 2002; 2006). Other determinants are quality of infrastructure (Cheng & Kwan, 1999), investment promotions (Loewendahl, 2001) skilled and qualified human capital (Kar 2013; Lewin, Massini, & Peeters, 2009; Ndeffo, 2010; Suliman & Mollick, 2009).

However, the argument on taxation, which constitutes a major component of the

locational advantage, has received little attention in Africa. Indeed, the effect of taxation (or fiscal incentives) on FDI remains a subject of controversy among Economists and those in policy circles. One side of the argument is that globalization coupled with the gradual elimination of barriers to capital movements provides an impetus for companies to be more mobile. Therefore, economies could compete successfully for FDI in global markets by offering business friendly tax environment (Black & Hoyt, 1989; Blomstrom & Kokko, 2003; Bora, 2002; UNCTAD, 1996). On the other side of the debate is the belief that taxes are distortionary because the costs of tax incentives often outweigh the benefits hence may not be the first-best mechanism for attracting FDI (e.g. Cleeve, 2008; Osman, 2000; Wilson, 1996).

The role of tax in driving FDI in Africa, no doubt, remains an empirical question. Governments often offer friendly tax regimes to attract and maintain FDI in order to reap its benefits. However, since at the same time economies in the sub region also rely heavily on corporate taxes to generate revenues to finance development and also to protect infant industries, the tax regime may be too demanding, thereby discouraging FDI. It is, therefore, not clear how specific obligations of African tax systems affect FDI. This study contributes to the FDI debate in the African context in two main ways: First, it examines the extent of the relationship between three important tax obligations (i.e. the percentage of profit that is taxed, number of taxes that business pay, and the time it takes to meet tax obligations) and the magnitude of FDI that exist in Africa. In doing so, the study seeks to answer the question: which of the tax obligations has the greatest relationship with FDI stock? Paying attention to the separate tax measures is important because it sheds light on how FDI reacts differently to these different aspects of tax obligations. This is crucial for in designing well-targeted policies to improve FDI stock in the sub-region. For example, the percentage of profit that is taxed measures the direct burden of the tax on foreign investors and the potential distortions that may be created in the economy. The last two measures on the other hand reflect the complexity and the bureaucratic nature of the tax system, which in turn, can exacerbate tax compliance cost for firms. Second, the study investigates the extent to which tax obligations dilute the factors in sub-Saharan Africa. The key question here is does tax obligation dominate other determinants of FDI in Africa? .

Restricting the study to sub-Saharan Africa is important because the region is unique relative to other regions not only in terms of factors that drive and sustain FDI but also in

terms of economic structures (Brunetti, Kisunko, & Wider, 1997); (Batra, Kaufman, & Stone, 2003); Asiedu, 2002). The policy prescriptions from studies on advanced economies cannot be relevant to developing economies due to differences economic structures among others. Studies examining the relationship between of tax and FDI abound. However, aside being bias towards developed countries, they primarily focus on establishing the relationship between FDI and one category of tax or the other. For example, (de Mooij & Ederveen, 2003) examines the impact of rate of capital tax on FDI inflows in America. Desai, Foley, and Hines Jr. (2004) examines indirect taxes (taxes other than payroll and corporate income taxes) in Germany (see also Devereux and Griffith (1998, 2003), Buettner and Ruf (2004), for a panel of German multinationals). Egger and Radulescu (2008) examine the effect of both labour tax and capital income tax. see also Gorter and De Mooji (2001) for Europe, (Bénassy-Quéré, Fontagné, & Lahrèche-Révil, 2005) and Rubinstein and Sadka (2005) for OECD countries. A number of studies indicate that the tax sensitivity of FDI varies with the income level of host countries (see, for example, Mutti and Grubert 2004; Blonigen and Wang, 2005; and Azemar and Delios, 2008; and Goodspeed et al., 2011).

2. Brief stylized facts about Corporate Taxation in Africa

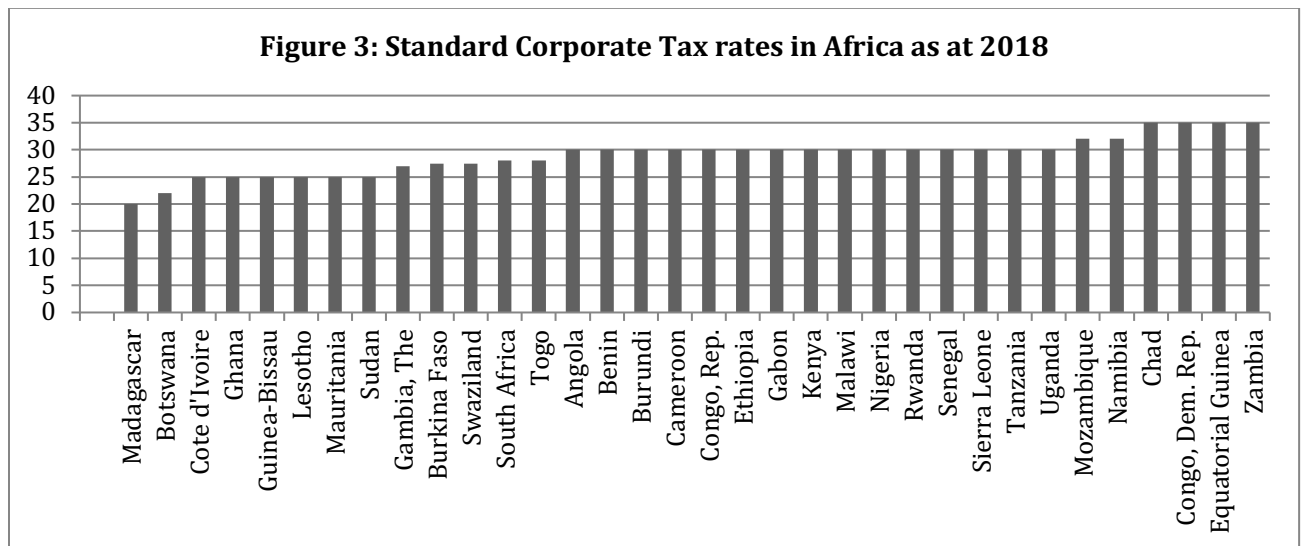
Three key facts characterise the corporate tax regime in Africa. First, average statutory corporate taxes are higher in Africa than in all regions in the world. The average statutory corporate tax rate in Africa is about 28.73 percent while Europe has the lowest at 18.35 percent. Table 1 presents the average statutory corporate tax rates by region.

Table 1: Average Statutory Corporate tax rate by Region

Region	Average Rate	Number of Countries
Africa	28.3	48
South America	28.73	13
Oceania	23.67	18
North America	23.08	30
Asia	20.05	45
Europe	18.35	49
OECD	24.18	35
World	22.96	202

Source: Jahnsen & Pomerleau (2017)

Second, corporate taxes in Africa have generally seen an increase between 1980 and 2017, contrasting the falling trend in other regions of the world. For example, the average rate declined by almost a 55 percent in Europe and 28 percent in South America. However, that of Africa, Oceania, and South America all increased, although the increase was relatively small, with the absolute change being less than 1 percentage point (Jahnsen & Pomerleau, 2017). Third, the standard rates therefore vary widely within Africa, ranging from 20 percent in Madagascar, 35 percent in Chad, Democratic Republic of Congo (DRC), Equatorial Guinea and Zambia. However majority of the countries has a rate of 30 percent (See Table 3). Nonetheless, between 2009 and 2013, at least 18 African countries marginally reduced their corporate tax rates. They are Botswana, Burkina Faso, Burundi, Cape Verde, Comoros, Congo (DR), Congo (Rep.), Gambia, Liberia, Libya, Madagascar, Mali, Namibia, São Tomé and Príncipe, South Africa, Swaziland, Togo and Zimbabwe. There were no downward adjustments in tax rates for the extractive industry sector, they were either maintained or increased (Muyandi et al., 2014).



Source: constructed by authors based on figures compiled from (Deloitte, 2018).

Finally, differentiated tax regimes are common across sectors in Africa with oil sectors attracting higher taxes (see *Deloitte, 2018 for a detailed information*). Just to highlight few examples, Angola has standard industrial corporate tax rate of 30 percent applied to both Angolan companies. However, income from certain activities, such as agriculture, forestry and cattle raising, is subject to tax at a rate of 15 percent. Mining activities are subject

to tax at a rate of 25 percent. Furthermore, income from oil and gas extraction is subject to oil income tax at a total rate of 50 percent (under production-sharing agreements) or 65.75 percent (under other types of joint ventures). In addition, there are about nine different types of withholding taxes (WHTs) varying between 5 percent and 15 percent. Benin also has a standard rate of 25 percent, however, oil companies are subject to rate between 35 percent and 45 percent. Chad which is among the countries with the highest corporate tax rate of 35 percent but levies between 40 percent and 75 percent on companies operating in the hydrocarbons sector. Similarly, Gabon applies 35 percent to oil and mining sectors. Ghana (though has standard rate of 25 percent) imposes 22 percent on hotels but 35 percent mining/petroleum companies and additional 8 percent tax imposed on repatriated branch profits.

3. Methodology and Data

This paper is a panel study of 36 countries covering the period 2005 to 2016. The panel approach is adopted for its ability to improve empirical work by reducing the limitations which are usually imposed by time frames or missing data among others (Sala-i-Martin, 1994). In addition, it avoids some business-cycle difficulties that may arise with regular time series datasets given the fact that the time-dimension of the panel data relative to the number of countries in the study is small. The relationship between tax obligations and FDI in SSA is examined by estimating several versions of the baseline model:

$$(1) \quad Y_{it} = \alpha_i + \sum_{k=1}^K \beta_{k,it} X_{k,it} + \mu_{it}$$

where; the variable Y , is the FDI. The subscript $i = 1, \dots, 36$ captures each economy used in the panel and $t = 2005, \dots, 2016$ (the number of years covered in the study). The variable X is a vector of explanatory variables (which includes measures of tax obligations and other control variables). The parameter β is a vector of coefficients to be estimated.

In this study FDI is defined as the stock of FDI in the host economy (measured in million dollars). This definition follows the argument that in order to reflect real economic activity, it is appropriate to use investments in stocks of property, plant and equipment (PPE) which are undertaken or held by foreign affiliates in a particular host country (Feld & Heckemyer, 2008). It also comprises real investments and financial flows due to mergers or

acquisitions of already existing capital. Bénassy-Quéré, Coupet, & Mayer (2007) chooses bilateral FDI stock to be the dependent variable. Similarly, Wei (2000) uses bilateral FDI stock as the dependent variable. The choice of stock of FDI rather than the net inflow of FDI is informed by the fact that tax obligations tend to affect FDIs that are already operational in domestic economies rather than the inflow of FDI.

Different measures of tax have been used in empirical studies (see for example, Hansson & Olofsdotter, 2010; Hunady & Orviska, 2014; Wolff, 2007). Some use statutory tax rates at the country or regional level whereas others make use of average tax rates. Arguing from theoretical perspective, others prefer effective marginal and average tax rates on the basis that such measures are forward-looking and thus better reflect the situation investors find themselves in at the time of making a decision (King and Fullerton, 1984; Devereux and Griffith, 1998; 1999). This study departs from previous one by focusing on three loads (obligations) placed on firms by the tax system: (i) number of taxes that business pay, (ii) the time it takes to meet tax obligations and (iii) the percentage of profit taxed and The first two measures of tax obligations gives an indication of level of harmonization and complexity as well as the level of bureaucracy inherent in the tax system, while the third measures the direct burden of tax on firms. For control variables, we concentrate on wage, minimum required capital for start-ups and market size (measured real GDP) as model. Following the literature, GDP deflator and exchange rate (local currency against one US dollar) are included to as controls to capture the macroeconomic environment. Table 2 provides the description of all variables used in the estimations and the sources of the data

Table 2: List of Variables and sources of data

Variable name	Measurement	Source of data
Foreign Direct Investment (LFDI)	Log of total stock of FDI in million US dollars	United Nations Conference on Trade and Development (UNCTAD) database
Wage (LW)	Annualised monthly minimum wage in US dollars	International Labour Organisation (ILO) website
Market size (LY)	Log of GDP	World Bank's World Development Indicators (WDI)
General price level (LP)	Log of GDP deflator	World Bank's World Development Indicators (WDI)
Bilateral exchange rate	Exchange rate between the	World Bank's World

(LEX)	domestic currency and the US Dollar	Development Indicators (WDI)
Natural resources (NR)	Measured as natural resource rent as a percentage of GDP	World Bank's World Development Indicators (WDI)
Time taken to prepare and pay taxes (LPT)	Total number of hours taken to honour tax obligations	World Doing Business Indicators
Number of taxes paid (NTP),	Total number of tax obligations required to be honoured by businesses	World Doing Business Indicators
Domestic profit tax (PT)	Percentage of the corporate income taxed	World Doing Business Indicators

3.1 Estimation Technique

The panel model specified in equation (1) assumes an individual varying effect which is constant over time (α_i). The unobserved heterogeneity is addressed by adopting the normal approach of taking the first differences if the second dimension of the panel is a proper time series. Taking the first difference of equation (1) effectively eliminates the individual fixed effects, thus allowing the variations in the dependent variable to be ascribed to the explanatory variables. However, applying first difference transformation comes at the cost of introducing a correlation between the lag of the dependent variable and the error term, creating an endogeneity in the model given its dynamic nature. To address this problem of endogeneity and its possible biases, the GMM system-estimator proposed by (Blundell & Bond, 1998) is employed due to its efficiency. According to Arellano-Bond (1991) as many as $\frac{1}{2}(T[T - 1])$ instruments can be generated from $N \times T$ panel data, where N is the number of individual observation and T is the maximum time period. Given that the data for this study includes 12 time periods (T=12) as many as 66 instruments can be generated from the dependent variable alone. The key strength of the system-GMM estimator (Blundell-Bond estimator) is that it uses both lagged levels as instruments for contemporaneous first-differences and lagged differences as instruments for contemporaneous levels, as against the Difference-GMM (Arellano-Bond estimator) estimator which uses only lagged levels as instruments for contemporaneous differences.

Using the Blundell and Bond (1998) system GMM approach therefore solves possible endogeneity problem in this study by including the lagged difference of FDI stock as instrument.

3.2 Post Estimation Tests

The GMM based estimators do not impose a great deal of assumptions on the error term. Due to this, very few post estimation tests are needed after a GMM based estimation (Wooldridge, 2010). Two popular tests are proposed after the Arrelano and Blundell estimation (Blundell & Bond, 1998). The first is the Arrelano and Bond test of autocorrelation (*AR-TEST*) which is built in the STATA package as *estat abond*. The *AR-TEST* report the test statistics for the first and second difference autocorrelation in default mode but the lag levels can be changed. It has a null hypothesis of no autocorrelation in the first difference error. Thus, it is required that the null hypothesis is not rejected. That is, the bigger the probability value of the *AR-TEST* the lesser the problem of autocorrelation in the model. A rectification to the autocorrelation problem is to estimate the two-step equation. In two-step estimation, the standard covariance matrix is robust to panel-specific autocorrelation and heteroskedasticity, but the standard errors are downward biased (Mileva, 2007). Two-step robust can be used in STATA to get the finite-sample corrected two-step covariance matrix (Drukker, 2008). The second test is the Sargan test of valid over-identifying restriction. It has a null hypothesis of correct over-identifying restrictions, which requires that we must fail to reject the null just as in the case of the *AR-TEST*.

4. Results and Discussion

This section provides the results and discussion for the study. We first present the summary statistics of the key explanatory variables: the number of tax obligations, the length of time it takes to voluntarily honour tax obligations and the percentage of profit taxed (see Table 3)

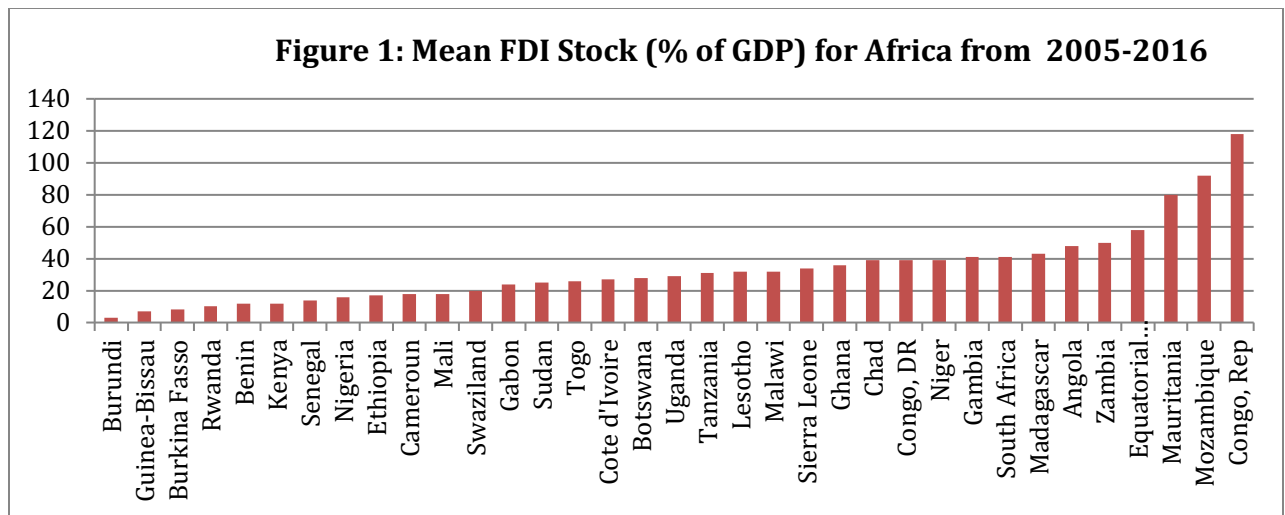
Insert Table 3

In terms of the number of taxes to be paid, Table 3 shows that the number of tax obligations in Africa varies markedly in Africa. This ranges from as low as 9 in South Africa to as many as 65 in Cote d'Ivoire. After Cote d'Ivoire comes countries such as Senegal with 59 different taxes, Congo Republic with 57, Benin with 55, Chad has 54, Nigeria, 52 and

Mali, 50 different taxes.

Table 3 further shows that the time involved in meeting tax obligation ranges from 118 hours (in Swaziland) to 815 hours (in Nigeria). This may suggest that Nigeria may have the most bureaucratic and complicated tax system among the selected countries over the sample period. Other countries with relatively longer time to meet tax obligations include Chad (735 hours), Mauritania (669), Cameroun (657) Senegal (645), Congo Republic (605), Equatorial Guinea (492), Gabon (488 hours) and the Gambia (366 hours). Finally, over the period 2005 to 2016, on the average, the percentage of profit paid as tax ranges from as low as 2 percent in the Republic of Congo to as high as 49 percent in Democratic Republic of Congo (DRC). Countries with single rates are Congo Republic (2 percent), Zambia (2 percent), The Gambia (6 percent), Cote d'Ivoire (9 percent) and Sierra Leone (9 percent). The top 6 countries with the highest rates after DRC are Kenya (32 percent), Mozambique (31 percent), Chad (31 percent), Cameroun (30 percent), Swaziland (28 percent), Nigeria (28 percent), Rwanda (26 percent) and Burundi (25 percent).

In terms of FDI stock, Table 3 shows that FDI (as percentage of GDP) varies among Africa economies.



Source: *constructed by Authors based on data used for the study sourced from (UNCTAD) database*

The country with the highest mean FDI stock over the sample period is Congo Republic (118 percent) followed by Mozambique (92 percent), Mauritania (80 percent), Equatorial Guinea (58 percent) and Zambia (50 percent). Other countries include Angola (48 percent), Madagascar (43 percent), South Africa (41 percent) and the Gambia (41 percent). Interestingly, most of these countries are resource-rich countries, suggesting a strong pulling

effect of natural resource on FDI. Cleeve, Denrah, & Yiheyis (2015) documents that about 54 percent of FDI inflow to SSA went to the primary sector (natural resources) in the period 1996–2000. In the year 2005, countries with sizable natural resources and large domestic markets attracted about 66 percent of the total FDI inflow to the region. Those countries were still the leading recipients of FDI inflow by the end of 2009 (UNCTAD, 2006, 2009). The key natural resources that have attracted FDI flows to Africa are gold, diamonds, and oil; manganese and cobalt, bauxite, chromium and platinum (Morisset, 2001).

Burundi has the lowest FDI stock (3.0 percent) over the sample period. Other countries with low FDI stock include Guinea-Bissau (7 percent), Burkina Faso (8 percent), Rwanda (10 percent), Benin (12 percent), Kenya (12 percent), Senegal (14 percent) and Nigeria (16 percent). An important observation is that some of these countries are either war/conflict/terrorist prone zones, have higher corporate tax rates, greater number of taxes or complicated tax system (reflected in the hours taken to meet tax obligations). For example, Benin has as high as 55 different taxes and Senegal has 59. Nigeria, though is an oil-rich economy, has complicated tax system (as many as 52 different taxes). It also suffers from frequent terrorist attacks and has relatively higher average statutory corporate tax rate at 28 percent (higher than global average corporate tax rate of 22.9 percent) (Refer to Table 1). Kenya has current standard corporate tax rate of 30 percent making it one of the countries in Africa with the highest average corporate tax rate in Africa (only after DRC). In addition, Kenya often comes under terrorists' attacks. Collier, Elliott, Hegre, Reynal-Querol, & Sambanis (2003) note that terrorism imposes a negative economic consequences on a country by diverting foreign direct investment (FDI), destroying infrastructure, redirecting public investment funds to security, or limiting trade. Kinyanjui (2014) finds that terrorism activities reduced FDI in Kenya by 14 percent through a negative effect on confidence.

4.1 Regression Results

Thirteen (13) different models are estimated to provide better understanding on how tax obligations affect the stock of FDI in SSA. These models are presented in Table 4. Columns (1) to (3) presents regression estimates of the individual tax obligation variables (NTP, PT and LTP respectively) after including them one after the other. Column (4) includes all the tax variables in the estimations and thus serves as the baseline.

Insert Table 4

The regression results in columns (1) to (3) indicates that the coefficients of all the tax obligation variables are significant and have effect on the stock of FDI. Specifically, the coefficient of NTP of 0.012 implies that a unit increase in the number of taxes leads to about 0.012 percentage reduction in the stock of FDI. Similarly, a percentage increase in the profit tax is associated with about a 0.013 percent decline in FDI stock. Furthermore, a percentage increase in the time taken to honour various tax obligations causes stock of FDI to decline by 0.44 percent. Similar results in for the effect of various tax obligations on the stock of FDI in column (4) which combines all the tax obligations in the same regression. Results obtained in this study is consistent with results obtained by Hansson & Olofsdotter (2010), for 27 EU countries for the period 1995-2006. It is also in line with the argument of Wolff (2007) that relatively high corporate taxes increases the probability of firms to reinvest profits and reduce the percentage of debt financed FDI. As indicated in Table 1, SSA has one of the highest corporate tax regimes in the world. The results further confirms earlier studies in the literature that market size (LY), natural resources (NR) and exchange rate (EX) are determinants of FDI in SSA (see Cantah, Brafu-Insaidoo, Wiafe, & Adams, 2018).

However, to get a better understanding of the extent to which these tax obligations contribute to the reduction in FDI in SSA given these well known drivers of FDI, we interact the tax obligation variables with Natural Resources (NR), Market Size (GDP) and Exchange rate (EX). The results of the interaction between natural resources and profit tax (PT), number of taxes (NPT) and length of time to pay taxes (LPT) are presented in columns (5), (6) and (7) respectively. The coefficients of the joint significance test for PT/PTNR, NR/PTNR, NPT/NPTNR and NR/NPTNR are all found to be statistically significant at 1 percent and 10 percent respectively. Similarly, the coefficients of the joint significance tests for NTP/NTPNR and NR/NTPNR are statistically significant at 5 percent. This implies that, although tax obligations have negative effects on FDI stock, the existence of natural resources may to some extent dilute the effects. First, we consider how natural resource affects the relationship between profit tax and the stock of FDI. The results indicate that, a percentage increase in profit tax causes the stock of FDI to decline by $(-0.01 + 0.01 \times (0.09) = -0.009)$ by 0.01 percent at the mean of NR. This implies that economies with greater levels of natural resources are likely significantly reduce the negative

impact of profit tax on the stock of FDI as further increases NR would change the negative effect of PT on FDI to positive. Interestingly, the sign of the interaction term and the coefficient of NR seem to suggest where natural resources are present profit tax does not matter for the stock of FDI, thus an increase in NR at the mean of PT still causes the stock of FDI to increase by 0.39 percent. The Profit Tax does not really matter when more natural resources are discovered for SSA economies. This could probably point to the long held notion that FDI in the natural resource sector of Africa are able to negotiate special concessions through tax treaties in the form of lower tax rates, tax holidays/havens etc.

In column (6), the coefficient of the interaction between NTP and NR (NTPNR) indicates that the negative effect of the number of taxes paid on the stock of FDI is not reduced by the presence of natural resource. Specifically, an increase in the number of taxes paid in an economy causes the stock of FDI to decline by 0.013 percent at the mean of NR. The findings further show that the positive effect of natural resources on the stock of FDI is reduced by the negative effect of the interaction term. Thus, for each percentage increase in the level of NR, the stock of FDI is reduced by 0.064 at the mean of NTP. The results clearly show that the number of taxes paid has a depressive effect on the stock of FDI in SSA. In the same vein, an increase in the number of taxes paid in an economy causes the stock of FDI to decline by 0.013 percent at the mean of NR. Thus, an economy with high levels of natural resources together with relatively high number of taxes is more likely to see declines in its stock of FDI. Similar results are obtained for the interaction between LTP and NR (LTPNR) in column (7). That is, a percentage increase in NR causes the stock of FDI to increase by 0.42 percent. However, a percentage increase in LTP causes the stock of FDI to decline by 0.30 percent at the mean of NR. The sign of the coefficient implies that further increases in the time taken to prepare and pay taxes dampens the effect of NR on the stock of FDI. Obviously, greater number of tax obligations not only imposes an administrative inconvenience, but also increase both operational costs in terms of personnel and logistics. These have financial implications and therefore the adverse effect on the profitability.

The results obtained for Market size (LY) suggests that the negative effect of PT is reduced by higher level of larger market size, however, the NPT and LPT are found to reduce the positive effect of market size on FDI stock.

Columns (8), (9) and (10) presents the results of the interacted terms between exchange rate and the tax variables. The coefficients of the joint significance test presented in columns (8) to (10) are all found to be statistically significant at 1 percent. The interaction between PT and LEX is positive suggesting that the negative effect of profit tax on the stock of FDI is reduced by depreciation of the domestic currency. This is probably because of the fact that a number of FDI's that come to SSA economies are mostly non-market seeking FDI's (see, Cantah et al., 2018). Depreciation of the domestic currency may enhance the export of exploited natural resources and hence the profitability above the adverse effect of PT on the stock of FDI. Thus, it may provide incentives (locational advantage) for FDI's to remain in the host country. Similar result is obtained for the interaction between exchange rate and LTP. The story is different for NTP where the coefficient of the interaction term suggests that the negative effect of NTP is not diluted by depreciation of the domestic currency.

In addition to the tax variables in the model, the study also controlled for wage level (LW), general price level (LP) measure by the log of GDP deflator, bilateral exchange rate between the domestic currency and the US Dollar (LEX), market size (LY) measured by the Gross Domestic Product of the country, and Natural Resources (NR). All these variables are found to be statistically significant in the baseline model and with the expected signs. That is, LW and LP have significant negative effect on the stock of FDI as expected. On the other hand, LEX has positive significant effect on the Stock of FDI in SSA and this could be attributed to the non-market seeking nature of FDI's (see, Aseidu, 2012) that come to a number of African countries, depreciation of the domestic currency makes the exports of such produce of foreign firms relatively cheaper hence, the positive relationship between exchange rate depreciation and the stock FDI. Both NR and LY are also positive and significant as expected.

5. Conclusion

The objective the study was to examine the effect of tax obligations on the stock of FDI for SSA for the period 2005 to 2016. The study finds that various tax obligations tend to have negative effect on the stock of FDI in SSA. Our results provide some answers to why FDI into the continent continues to decline despite several efforts by SSA economies to improve macroeconomic stability, growth, institutional quality and governance structures.

The results of the study suggest that economies with high number of taxes together with longer time requirements to honour tax obligations are more likely to see a reduction in their stock of FDI even in the presence of natural resources, large markets and exchange rate benefits. High number of taxes increases the financial burden on firms which may erode gains from depreciating domestic currencies. Also, persistent depreciation of the domestic currency could also be inimical to the revenue base of these firms, hence when they are faced with more taxes it tends to affect the stock of FDI in SSA. Thus when SSA countries are able to reduce the several taxes by consolidate them into few and also reduce the time it takes to honour tax obligations, they are more likely to maintain and also increase the stock of FDI in their economies.

What is puzzling is the finding that the percentage of profit paid as tax has a negative effect on FDI stock, however its impact is offset by the impact of natural resource endowments. Thus, the attraction by natural resources is stronger than the corporate tax paid. As long as investors have greater incentives (advantages), they are not deterred by how much they have to pay as tax. Yet, this finding could be an indication that foreign investors in Africa's natural resource sector could manage to broker a good deal for themselves. In terms of policy, the paper is of the view that policymakers in SSA should work to reduce the bureaucratic process that may increase the time demands on voluntary tax compliance. Secondary, there is the need to ensure that the number of tax obligations is made fewer through harmonisation.

References

- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and Economic Growth: The Role of Local Financial Markets. *Journal of International Economics*, 64(1), 89–112.
- Asiedu, E., & Villamil, A. (2000). Discount Factors and Thresholds: Foreign Investment when Endorsement is Imperfect. *Macroeconomic Dynamics*, 4(1), 1–21.
- Asiedu, Elizabeth. (2006). Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *World Economy*, 29(1), 63–77.
- Batra, G., Kaufman, D., & Stone, A. (2003). *Investment Climate around the World: Voices of the firms from the World Business Environment Survey*. Washington DC: World Bank.
- Bénassy-Quéré, A., Coupet, M., & Mayer, T. (2007). Institutional determinants of foreign direct investment. *World Economy*, 30(5), 764–782.
- Bénassy-Quéré, A., Fontagné, L., & Lahreche-Révil, A. (2005). How Does FDI React to Corporate Taxation? *International Tax and Public Finance*, 12, 1–21.

- Bevan, A. A., & Estrin, S. (2000). The Determinants of Foreign Direct Investment in Transition Economies. *CEPR DP, No. 2638*.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, *87*(1), 115–143.
- Brunetti, A., Kisunko, G., & Wider, B. (1997). Institutional Obstacles to Doing Business: Region-by-Region Results from Worldwide Survey of the Private Sector. *World Bank Policy Research Paper No. 1759, World Bank*.
- Busse, M., & Hefeker, C. (2007). Political risk, institutions and foreign direct investment. *European Journal of Political Economy*, *23*(2), 397–415.
- Campos, J. E., Lien, D., & Pradhan, S. (1999). Impact of Corruption on Investment: Predictabilities Matters. *World Development*, *27*(6), 1059–1067.
- Cantah, W. G., Brafu-Insaadoo, W. G., Wiafe, A. E., & Adams, A. (2018). FDI and Trade Policy Openness in Sub-Saharan Africa. *Eastern Economic Journal*, *44*(1), 97–116. <https://doi.org/10.1057/ej.2016.9>
- Chowdhury, A., & Mavrotas, G. (2006). FDI and Growth: What Causes what? *The World Economy*.
- Cleeve, E. A., Denrah, Y., & Yiheyis, Z. (2015). Human Capital and FDI Inflow: An Assessment of the African Case. *World Development*, *74*, 1–14. <https://doi.org/org/10.1016/j.worlddev.2015.04.003>
- Collier, P., Elliott, E., Hegre, H., Reynal-Querol, M., & Sambanis, N. (2003). *Breaking the Conflict Trap: Civil War and Development Policy*. Washington DC: World Bank.
- de Mooij, R. A., & Ederveen, S. (2003). “Taxation and Foreign Direct Investment: A Synthesis of Empirical Research. *International Tax and Public Finance*, *10*(6), 673–93.
- Deloitte. (2018). *Guide to Fiscal information: Key economies in Africa*. London.
- Drukker, D. M. (2008). Econometric analysis of dynamic panel-data models using Stata. In *Summer North American Stata Users Group meeting* (pp. 24–25).
- Dunning, J. (1979). Toward an Eclectic theory of international production: Some empirical tests. *Journal of International Business Studies*, *11*(1), 9–31.
- Dunning, J. H. (2000). The eclectic paradigm as an envelope for economic and business theories of MNE activity. *International Business Review*, *9*, 163–190. [https://doi.org/10.1016/S0969-5931\(99\)00035-9](https://doi.org/10.1016/S0969-5931(99)00035-9)
- Ezeoha, A. E., & Cattaneo, N. (2012). FDI flows to sub-Saharan Africa: The impact of finance, institutions, and natural resource endowment. *Comparative Economic Studies*, *54*(3), 597–632.
- Feld, L. P., & Heckemyer, J. H. (2008). FDI and Taxation: A Meta-Study. *ZEW Discussion Paper No.08-128*.
- Frenkel, M., Funke, K., & Stadtmann, G. (2004). A Panel Analysis of Bilateral FDI Flows to Emerging Economies. *Economic Systems*, *28*, 281–300.
- Gastanaga, V., Nugent, J. B., & Pashamova, B. (1998). Host Country Reforms and FDI Inflows: How much Difference Do they Make? *World Development*, *26*(7), 1299–1314.
- Hansen, H., & Rand, J. (2006). On the Causal Links Between FDI and Growth in Developing Countries. *World Economy*, *29*, 21–41. <https://doi.org/10.1111/j.1467-9701.2006.00756.x>
- Hansson, \AAsa, & Olofsdotter, K. (2010). Tax differences and foreign direct investment in the EU27. *Department of Economics, Lund University Working Paper*, *3*.
- Hunady, J., & Orviska, M. (2014). Determinants of Foreign Direct Investment in EU Countries-Do Corporate Taxes Really Matter? *Procedia Economics and Finance*, *12*, 243–250.

- Jahnsen, K., & Pomerleau, K. (2017). Corporate Income Tax Rates around the World, 2017. *Fiscal Fact*, (559).
- Kinoshita, Y., & Campos, N. F. (2003). Why Does FDI Go Where It Goes? New Evidence from the Transition Countries. *CEPR Discussion Paper, No 3984*.
- Kinyanjui, S. (2014). The Impact of terrorism on foreign direct investment in Kenya. *International Journal of Business Administration*, 5(3), 148–157.
- Muyandi, K., Hamzaoui, R., Puente, C. G., Ogazon, L., Marinho, A. T., & Montes, M. (2014). *Tax policy trend in Africa*. Amsterdam.
- OECD. (2002). *Foreign Direct Investment for Development*. Paris: OECD Publications Service.
- Sala-i-Martin, X. (1994). Cross-sectional regressions and the empirics of economic growth.
- United Nations Conference on Trade and Development(UNCTAD). (2018). *World Investment Report - 2018*. Geneva.
- Wei, S. J. (2000). How Taxing is Corruption on International Investors? *Review of Economics and Statistics*, 82(1), 1–11.
- Wolff, G. B. (2007). Foreign direct investment in the enlarged EU: do taxes matter and to what extent? *Open Economies Review*, 18(3), 327–346.

APPENDIX

TABLE 3: SUMMARY STATISTICS BY COUNTRY

	FDI Stock % GDP		Profit Tax		Number of Taxes		Time to Prepare and Pay Tax	
	Mean	N	Mean	N	Mean	N	Mean	N
Angola	48	12	25	12	32	12	289	12
Benin	12	12	13	12	55	12	270	12
Botswana	28	12	19	12	34	12	147	12
Burkina Faso	8	12	17	12	45	12	270	12
Burundi	3	12	25	12	29	12	209	12
Cameroon	18	12	30	12	44	12	657	12
Chad	39	12	31	12	54	12	735	12
Congo, Dem. Rep.	39	12	49	12	43	12	327	12
Congo, Rep.	118	12	2	12	57	12	605	12
Cote d'Ivoire	27	12	9	12	65	12	272	12
Equatorial Guinea	58	12	23	12	46	12	492	12
Ethiopia	17	12	27	12	30	12	245	12
Gabon	24	12	19	12	26	12	488	12
Gambia, The	41	12	6	12	48	12	368	12
Ghana	36	12	19	12	33	12	244	12
Guinea-Bissau	7	12	16	12	46	12	218	12
Kenya	12	12	32	12	39	12	353	12
Lesotho	32	12	12	12	25	12	366	12
Madagascar	43	12	19	12	24	12	226	12
Malawi	18	12	24	12	28	12	229	12
Mali	18	12	12	12	50	12	270	12
Mauritania	80	12	25	12	40	12	669	12
Mozambique	92	12	31	12	37	12	226	12
Namibia	7	12	18	12	33	12	327	12
Niger	39	12	18	12	41	12	270	12
Nigeria	16	12	28	12	52	12	815	12
Rwanda	10	12	26	12	24	12	144	12
Senegal	14	12	16	12	59	12	645	12
Sierra Leone	34	12	9	12	31	12	354	12
South Africa	41	12	23	12	9	12	235	12
Sudan	25	12	14	12	42	12	180	12
Swaziland	20	12	28	12	33	12	118	12
Tanzania	31	12	20	12	48	12	177	12
Togo	26	12	10	12	49	12	266	12
Uganda	29	12	22	12	31	12	209	12
Zambia	50	12	2	12	36	12	183	12

TABLE 4: GMM REGRESSION ESTIMATES

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
LFDI	0.60*** (0.04)	0.600*** (0.0229)	0.601*** (0.0196)	0.59*** (0.023)	0.578*** (0.031)	0.571*** (0.0283)	0.587*** (0.032)	0.556*** (0.030)	0.558*** (0.051)	0.589*** (0.029)	0.575*** (0.029)	0.589*** (0.033)	0.568*** (0.032)
LW	-0.0765*** (0.0183)	-0.0706** (0.0279)	-0.0969*** (0.0195)	-0.07*** (0.022)	-0.072*** (0.020)	-0.089*** (0.026)	-0.090*** (0.025)	-0.084*** (0.023)	-0.068*** (0.024)	-0.114*** (0.031)	-0.073*** (0.023)	-0.062** (0.026)	-0.068*** (0.021)
NTP	-0.0122*** (0.00199)			-0.01*** (0.002)	-0.013*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)	-0.013*** (0.003)	-0.038*** (0.011)	-0.011*** (0.003)	-0.012*** (0.002)	0.243 (0.196)	-0.012*** (0.002)
PT		-0.0128*** (0.00108)		-0.01*** (0.002)	-0.01*** (0.003)	-0.009*** (0.002)	-0.008*** (0.002)	-0.071*** (0.023)	-0.008*** (0.002)	-0.008*** (0.002)	-0.021 (0.048)	-0.011*** (0.002)	-0.008*** (0.002)
LTP			-0.443*** (0.0629)	-0.51*** (0.150)	-0.520*** (0.147)	-0.355*** (0.107)	-0.287** (0.118)	-0.262** (0.128)	-0.471*** (0.117)	-1.647*** (0.403)	-0.525*** (0.133)	-0.389*** (0.136)	-3.516 (2.650)
LP	-0.111** (0.0439)	-0.0182 (0.0448)	-0.141** (0.0589)	-0.23*** (0.076)	-0.251*** (0.087)	-0.214*** (0.065)	-0.177*** (0.062)	-0.400*** (0.085)	-0.247*** (0.057)	-0.173*** (0.066)	-0.250*** (0.095)	-0.118* (0.068)	-0.188*** (0.069)
LEX	0.332*** (0.0325)	0.268*** (0.0585)	0.370*** (0.0474)	0.37*** (0.052)	0.363*** (0.037)	0.378*** (0.058)	0.372*** (0.042)	0.290*** (0.052)	0.728*** (0.102)	-0.943*** (0.344)	0.374*** (0.061)	0.347*** (0.076)	0.355*** (0.047)
LY	0.476*** (0.0393)	0.412*** (0.0317)	0.448*** (0.0334)	0.50*** (0.035)	0.521*** (0.057)	0.512*** (0.061)	0.484*** (0.055)	0.558*** (0.045)	0.552*** (0.072)	0.437*** (0.047)	0.512*** (0.080)	0.864*** (0.298)	1.404** (0.627)
NR	0.321*** (0.102)	0.294** (0.136)	0.379*** (0.111)	0.455** (0.194)	0.101 (1.088)	3.137* (1.775)	1.187 (2.646)	0.567*** (0.143)	0.306 (0.255)	0.403*** (0.152)	0.471** (0.197)	0.383** (0.190)	0.278 (0.189)
PTNR					0.01 (0.038)								
NTPNR						-0.064* (0.039)							
LPTNR							-0.135 (0.449)						
PTEX								0.009*** (0.003)					
NTPEX									-0.011*** (0.002)				
LPTEX										0.243** (0.061)			
PTLY											0.001 (0.002)		
NTPLY												-0.011 (0.008)	
LTPLY													-0.164 (0.111)
Constant	-9.326*** (0.896)	-8.354*** (0.632)	-6.430*** (0.551)	-6.53*** (0.966)	-6.69*** (1.360)	-7.47*** (1.077)	-7.38*** (1.226)	-7.42*** (0.985)	-9.33*** (1.616)	1.30 (3.030)	-6.55*** (1.688)	-15.99** (6.575)	-28.81* (14.85)
Obs	410	410	410	410	410	410	410	410	410	410	410	410	410
Economies	36	36	36	36	36	36	36	36	36	36	36	36	36
Post Estimation Test													
AR Test	-0.560 [0.576]	-0.303 [0.762]	-0.516 [0.656]	-0.348 [0.728]	-0.293 [0.770]	0.282 [0.778]	-0.324 [0.746]	-0.571 [0.568]	-0.501 [0.616]	-0.389 [0.697]	-0.322 [0.748]	-0.230 [0.818]	-0.303 [0.762]

OI test	32.99 [0.99]	30.543 [0.91]	33.151 [0.899]	30.212 [0.72]	29.92542 [0.822]	30.73994 [0.792]	30.666 [0.850]	27.78608 [0.813]	30.0643 [0.914]	30.990 [0.712]	29.915 [0.991]	31.159 [0.952]	35.721 [0.812]
Joint Significant Test													
PT/PTNR					10.53 0.0052								
NR/PTNR					11.66 [0.003]								
NTP/NTPNR						66.46 [0.000]							
NR/NTPNR						5.56 [0.062]							
LTP/LTPNR							6.140 [0.047]						
NR/LTPNR							8.290 [0.016]						
PT/PTEX								14.76 [0.001]					
EX/PTEX								61.24 [0.000]					
NTP/NTPEX									48.73 [0.000]				
EX/NTPEX									60.02 [0.000]				
LTP/LTPEX										16.720 [0.000]			
EX/LTPEX										78.890 [0.000]			
PT/PTLY											13.56 [0.001]		
LY/PTLY											84.42 [0.000]		
NTP/NTPLY												96.41 [0.000]	
LY/NTPLY												477.85 [0.000]	
LTP/LTPLY													16.750 [0.000]
LY/LTPLY													247.55 [0.000]

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE A1: SUMMARY STATISTICS FOR ALL COUNTRIES

Variable		Mean	Std. Dev.	Min	Max	Observations
FDI	overall	33.11514	32.78615	0.223559	289.4712	N = 432
	between		23.9274	3.168132	118.2181	n = 36
	within		22.73813	-39.0567	212.5479	T = 12
W	overall	21022.49	37940.4	0.062327	224131	N = 429
	between		37831.19	0.170617	177914.2	n = 36
	within		7310.639	-14497.4	67239.29	T = 11.92
NTP	overall	39.38194	12.24271	7	67	N = 432
	between		11.91726	8.833333	64.83333	n = 36
	within		3.389311	24.54861	48.71528	T = 12
PT	overall	19.28079	10.53577	0	58.9	N = 432
	between		9.885705	0	48.925	n = 36
	within		3.971091	-2.14421	48.88912	T = 12
TP	overall	336.0507	189.5264	109	1120	N = 432
	between		181.3493	118	815.4667	n = 36
	within		62.22577	-50.016	640.584	T = 12
P	overall	256.4213	540.6285	37.63333	4462.042	N = 432
	between		520.0754	82.47602	3150.771	n = 36
	within		169.4221	-959.705	1567.693	T = 12
Y	overall	3727635	8518586	72146.88	4.64E+07	N = 432
	between		8523635	86883.39	3.81E+07	n = 36
	within		1329736	-7424636	1.30E+07	T = 12
NR	overall	0.103438	0.317674	0	2.00378	N = 413
	between		0.314866	0	1.419983	n = 36
	within		0.093138	-0.87669	0.768974	T = 11.47

NB wage (W) is in 1000s of US dollars and GDP (Y) are 10,000s of US dollars