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Monetary Policy Transparency as an Exchange Rate Determinant: Evidence from the United States

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The lack in the literature regarding monetary policy transparency and its impact on exchange rates may be justified since no objective transparency indices existed until recently. This paper examines the impact of monetary policy transparency on the real effective exchange rate for the United States and finds that transparency decreases the real effective exchange rate. This study also finds that the impact of oil price on the real effective exchange rate is negative. Finally, it was found that, while domestic deficits and debt have a negative impact on the real effective exchange rate, foreign deficits and debt have the opposite effect.

Keywords: Real Effective Exchange Rate, Monetary Policy, Transparency, Oil

JEL Classification: E52, E58, F31, F40, F4

I. Introduction

Due to the steadily rising attention to transparency in the last 20 years, the literature has been well-furnished with theory, practice, and empirical studies of transparency. Alongside transparency, the behavior of foreign exchange rates has gained much attention. Globalization has undeniably made the world a smaller place, that is, international trade and foreign investment are ever increasing, bringing countries closer together. The international integration of today's world makes the exchange rate an attractive area of study; consequently, the foreign exchange literature is also quite comprehensive. However, the literature lacks an important area of focus: monetary policy transparency and its impact on foreign exchange rates, which is the topic of this paper.

The deficiency in the literature may be justified, however, given the limitations¹ of monetary transparency models. Until recently, there were no objective measures of monetary policy transparency (Kia, 2011). Kia's study determined that models of transparency originating mainly from subjective measurements of transparency were problematic, and therefore proposed an objective transparency index. Using the first market-based, objective monetary policy transparency index (hereafter known as the "Kia Index"), this paper aims to fill the gap in the literature between monetary policy transparency and the seemingly apparent impact it has on exchange rates. This is accomplished by measuring the impact of monetary policy transparency on the real effective exchange rate for the United States—and it is the first study of its kind in the literature. The remainder of this paper is outlined as follows: survey of the literature, theoretical justification and methodology, data and model, and conclusion.

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¹ See Kia (2011) for the limitations of "pre-Kia Index" measures of transparency.

II. Survey of the Literature

While the literature is well-equipped with studies of both monetary policy transparency and the behavior of foreign exchange rates, there is relatively little in the literature that attempts to combine the two. Kuttner and Posen (2000), measuring inflation, monetary transparency, and G3 (United States, Japan, and European Union) exchange rate volatility, hypothesized about the extent to which domestic inflation and interest rate surprises contribute to short-run volatility in G3 exchange rates. They concluded that shocks from surprises should diminish in frequency and effect as monetary transparency increases, thus reducing exchange rate volatility. Kuttner and Posen measured monetary transparency by combining elements of transparency proposed by King (1997) and Posen (1999), which were, respectively, inflation targeting as the practice of monetary transparency, and characterizing elements of monetary transparency.

However, using this criterion, Kuttner and Posen (2000) did not produce an index to measure monetary policy transparency; according to Kia (2011) such an approach to determining transparency is problematic. Kuttner and Posen acknowledged this at least somewhat when they concluded the following:

“The magnitude of the impact of increased monetary transparency on G3 exchange rate volatility, however, remains open to question. There is no quantitative, cardinal, metric for transparency, and so no way of knowing how much stability is bought for a given increase...If these ballpark but consistent estimates of the benefits of transparency were correct, there would still [be] more than two-thirds of the present monthly volatility.” (p. 26)

If Kuttner and Posen had a monetary policy transparency index such as the one developed by Kia, it is possible that the study would have yielded more results that could explain the unexplained “two-thirds of the present monthly volatility.”

Eichengreen and Hausmann (1999) studied the relationship between exchange rates and financial fragility and concluded that adequate disclosure and transparency favored a more financially stable economy. Their evidence came from case studies of Argentina, Panama, and Australia, looking at capital flows as well as hedged and unhedged exposure to exchange risk. They found that financial fragility could be lessened if countries would adopt securities-market regulations that discourage insider trading, market cornering, and market manipulation. Eichengreen and Hausmann concluded that in order for this to ultimately work, monetary and fiscal institutions would need reformation in a way that enhances the independence, transparency, and credibility of policy-making authorities. While this study did not attempt to measure monetary transparency’s impact, it certainly acknowledged transparency’s importance in the relationship between exchange rates and financial fragility. It may have been, then, useful to have applied some measure of monetary transparency, had an objective measure been available, in more precisely determining their financial fragility model.

More recently, Protopapadakis and Flannery (2012) studied the effects of macroeconomic announcements on the exchange rate between the German and US currencies. Their study found a strong relationship between foreign exchange rates and both real and nominal sector developments for both countries. They also found that real sector announcements influence the exchange rate more strongly than money or inflation announcements do. And finally, they found that real growth appreciates the exchange rate and raises yields.

The paper of Protopapadakis and Flannery (2012) is particularly interesting due to the fact that such announcements have to come from at least one party who is willing and able to disclose macroeconomic data. Could not this party be a central bank, or government entity, such as the Federal Reserve or Bureau of Economic Analysis, respectively? Certainly. When the central bank announces, for example, its projections for growth, inflation, interest, etc., is this not an act of transparency? Certainly it is. Thus, it may be worthwhile in this particular study to add a transparency index as a variable in determining the effects of announcements on the exchange rate to see if more variation can be explained.

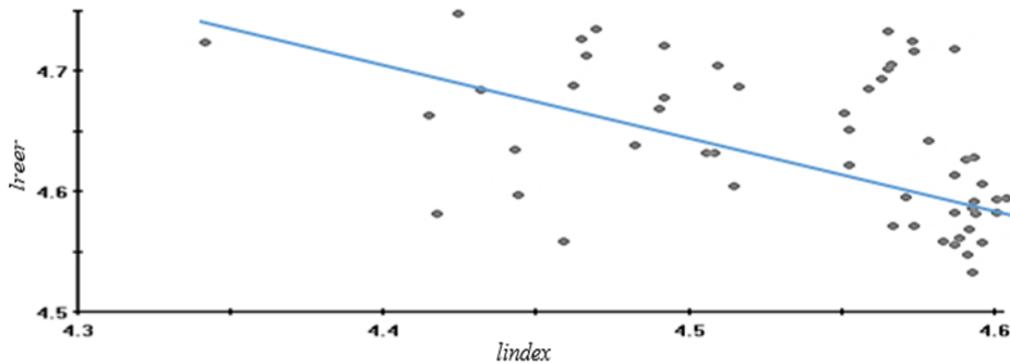
Caporale and Cipollini (2002) studied the drastic decline in the value of the euro relative to the US dollar that happened after the initial launch of the euro. By an unconventional method, they explored the transparency of the European Central Bank in order to explain the decline. Their method of determining monetary transparency was similar to that of Kia (2011) in that it focused on the deviations of spot interest rates from policy-determined rates. It differs from Kia in that Caporale and Cipollini used these deviations as a measure of monetary policy “uncertainty,” which was estimated using a stochastic volatility model. Nevertheless, Caporale and Cipollini found that by analyzing directly the impact of monetary transparency uncertainty on the euro-dollar exchange rate (meaning no other variables were used other than the mentioned rates for each country), the European Central Bank’s action and motivations were not well understood by market participants, and that the misunderstanding was perceived as a lack of transparency. As a result, market participants supposed more risk to be associated with the European Union and consequently moved their capital elsewhere, thus the depreciation in the euro relative to the US dollar.

To the best of the author’s knowledge, this is the extent of the literature regarding the impact of monetary policy transparency on the exchange rate. Thus we see a major lack of attention to the topic in the literature. While there are ample papers covering topics such as exchange rate determinants¹, exchange rate policy², and implications of monetary policy transparency³, none estimate an exchange rate as a function of some transparency index. Admittedly, some forms of transparency measurements have been used in some papers, such as the ones mentioned by Kuttner and Posen (2000). But as stated above, Kuttner and Posen did not create an index, and as a measure of monetary policy transparency, Kuttner and Posen observed characteristics of a central bank’s policy. As noted by Kia (2011), descriptive accounts of transparency concentrate on strategies that central bankers follow in order to communicate with the public. These transparency measures mostly include “do’s and don’ts” of central bankers’ actions, and the main problem with this measure is that no index can be derived/constructed from these “do’s and don’ts.” Therefore, the approach is problematic. While some papers include measures of transparency, certainly no papers use the transparency index developed by Kia to measure the impact of monetary transparency on exchange rates, especially since the Kia Index is relatively new. According to the scatter-plot (see Graph 1), there is a relationship between the real effective exchange rate and monetary policy transparency. The relationship indicated by the scatter-plot is negative. This relationship is what this paper examines by using the Kia Index to measure transparency’s impact on the real effective exchange rate.

² For example, see Makin (1984), Chunming (2011), and Kia (2013).

³ For example, see Bailliu *et al.* (2003), Fiess and Shankar (2009), and Ershov (2013).

⁴ For example, see Issing (2005), Geraats (2006, 2009), Dai and Sidiropoulos (2011), and Sánchez (2012).

Figure 1: Real Effective Exchange Rate and Transparency Index

Notes: Sample period is 1994Q2 to 2014Q2. Variable *lreer* is the log of the real effective exchange rate, calculated as the weighted average of bilateral exchange rates adjusted by relative consumer prices, where the exchange rate is defined as the domestic price of foreign currency, and *lindex* is the log of the Transparency Index. The blue line is a trend line, which indicates a negative relationship between variables *lreer* and *lindex*.

III. Theoretical Justification and Methodology

This paper follows the methodologies of both Kia (2013) and Wilson (2009) and in effect combines the two. Kia developed a theoretical monetary model of the real exchange rate and found its long-run determinants, and Wilson used a monetary approach to exchange rate determination by examining debt, deficit, and debt management in the United States. While the Kia and Wilson models have similar monetary and fiscal variables, there are a few differences that are of particular interest in this study.

First, Wilson's paper examined the effective exchange rate. Since monetary policy and its transparency in the United States have implications worldwide, the effective exchange rate is used in this paper, as opposed to a real exchange rate in Kia's model. This seems appropriate since the effective exchange rate is calculated as the weighted average of bilateral exchange rates, and can therefore give a more representative view. Second, Wilson's model used as an explanatory variable a consumer price index for the world (world CPI). For the same reason regarding worldwide impact of US monetary policy, world price is added in this study.

I extend the Kia (2013) model by adding the monetary policy transparency index as an explanatory variable. There is one more adjustment made to Kia's model that must be noted. Kia's theoretical monetary model of the exchange rate used Canadian data, with commodity price as an explanatory variable. This is justified as Canada is a commodity-oriented country. However, this logic may be inappropriate when applying the model to the US. Consequently, commodity price is replaced with a more appropriate variable. Since the US is a net oil-importing country, oil price is used in place of commodity price. This not only seems intuitively reasonable, but the replacement is also justified by the literature. For example, Harri *et al.* (2009) found that exchange rates, commodity price, and oil price are interrelated. Amano and Norden (1998) found a co-integrated relationship between oil price and the US real exchange rate, and that causality runs from the oil price to the exchange rate. Furthermore, and relating to the euro-dollar exchange rate in particular, Clostermann and Schnatz (2000) found that oil price is a fundamental determinant of the euro-dollar exchange rate.

Since exchange rates are relative prices, foreign variables must be considered. The foreign, or international, data in this paper are represented by the European Union. The exchange rate is the Real Narrow Effective Exchange Rate for the US, calculated as the weighted average of bilateral exchange rates, comprising 26 economies. Since there is no doubt that US monetary policy has implications worldwide, it is appropriate to use a representative rate. The same logic goes for the inclusion of European variables for the foreign perspective. In the calculation of the Real Narrow Effective Exchange Rate for the US, the euro area receives the greatest weight. Of the 26 economies included, 11 are from the euro area.

It is worth noting that China is the largest trading partner with the United States, in general. However, China is not considered in the narrow definition of the real effective exchange rate. The narrow definition was selected because the euro area receives the greatest weight, and with respect to the currency market, the US dollar and euro are the two most traded currencies. These two currencies are involved in approximately 61 per cent of all currency trades (data from the Bank of International Settlements, 2013). The yuan, China's currency, is not among the major currency pairs. Therefore, since the US dollar and euro are relatively more involved in the market than are other currencies, and given that the EU receives the highest weight in the effective exchange rate calculation, the narrow definition of the real effective exchange rate is appropriate, and European variables can represent the foreign perspective needed for the model.

Of course, it is possible to include, as foreign variables, fiscal variables for *all* of the economies used in the calculation of the effective exchange rate. However, this seems excessive and unnecessary since many countries receive a trade weight of less than one per cent, while others receive a trade weight between one and three per cent. These weights are so small in the effective exchange rate calculation that it seems impossible for the fiscal variables of these economies to have any statistically significant explanatory power in the model.

Incorporating monetary and fiscal changes that influence the value of currency, my long-run real effective exchange rate model, which is an extension of Kia's (2013), can be given by the following log-linear relationship:

$$\begin{aligned} lreer_t = & \beta_0 + \beta_1 lwp + \beta_2 lrm_t^s + \beta_3 li_t + \beta_4 ly_t + \beta_5 lg_t + \beta_6 defgdp_t + \\ & \beta_7 debtgdp_t + \beta_8 fdgdp_t + \beta_9 li_t^* + \beta_{10} debtgdp_t^* + \beta_{11} fdgdp_t^* + \\ & \beta_{12} loil_t + \beta_{13} index + u_t, \end{aligned} \quad (1)$$

where beta coefficients are constant coefficients and $\beta_1 < 0$, $\beta_2 < 0$, $\beta_3 < 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 < 0$, $\beta_7 < 0$, $\beta_8 < 0$, $\beta_9 > 0$, $\beta_{10} > 0$, $\beta_{11} > 0$, $\beta_{12} = ?$, $\beta_{13} < 0$, and l before any variable is the log of the variable. Variable *reer* is the real effective exchange rate for the United States (calculated as the weighted average of bilateral exchange rates, where the exchange rate is defined as the domestic price of foreign currency), *wp* is the world price index, *rm^s* is real money supply, *i* is gross interest rate (calculated by $[r/(1+r)]$, where r is US three-month Treasury bill rate), *y* is US real GDP, *rg* is US real government expenditure, *defgdp* is US deficit per GDP, *debtgdp* is US domestic debt per GDP, *fdgdp* is US foreign-financed debt per GDP, *i** is the foreign gross interest rate (calculated by $[r^*/(1+r^*)]$, where r^* is the EU three-month offer rate, LIBOR), *debtgdp** is EU domestic debt per GDP, *fdgdp** is EU foreign-financed debt per GDP, *loil* is real oil price, and *index* is the Kia Index. Further, *u* is an error term which is assumed to be white noise.

To better understand why each beta coefficient has its respective sign, it may be appropriate to review the calculation of the real effective exchange rate (*reer*), which, at time t , is calculated as:

$$reer_t = \sum_{j=1}^n w_j \left(\frac{E_{j,t} \times P_{j,t}}{P_t} \right) \quad (2)$$

where country $j = 1, 2, \dots, n$ is the domestic country's trading partner and w_j is the percentage weight of trade between the domestic country and foreign country j , where the weights sum to one. E_j is the nominal exchange rate between the domestic and foreign country j (defined as the domestic price of foreign currency, so that E_j falls with an appreciation of the domestic currency), P_j is foreign price level, and P is domestic price level. Note that in Equation (2) the expression in parenthesis is the real exchange rate between the domestic country and foreign country j . As an aside, the trade-based weighting pattern is time-varying. The respective trade weights and the time-varying pattern can be retrieved from the Bank for International Settlements.

We can now reference Equation (2) while explaining theoretically the expected sign of each beta coefficient. World price has a negative impact on the real effective exchange rate. One explanation for this is that as world price goes up, demand for US products will go up. An increase in demand leads to an increase in currency value, and thus a decrease in the exchange rate, E_j . Real money supply also has a negative impact on the real effective exchange rate. Based on the quantity theory of money, which states that there is a direct relationship between money supply and prices, an increase in money supply causes an increase in prices. This means that P increases, and the real effective exchange rate decreases. An increase in US interest rate attracts more international investors, and thus an increase in currency value. It follows that E_j decreases; therefore, the real effective exchange rate decreases.

One explanation for the positive impact of real GDP on the real effective exchange rate is that as income rises demand for imports rises. Foreign currency must be purchased to obtain imports, and thus domestic currency must be sold. It follows that E_j increases, as does the real effective exchange rate. A similar explanation can be given for the positive impact of real government expenditures. The negative impact of US deficit per GDP, US debt per GDP, and US foreign financed debt per GDP can be explained by their influence on the discount rate, in that they exert an upward pressure on the rate. The explanations for the relationships of international variables (foreign interest rate, EU debt per GDP, and EU foreign financed debt per GDP) are similar to those of US counterparts; accordingly, the beta coefficients for foreign variables have the opposite sign, which is positive. An increase in any of the foreign variables leads to an increase in the real effective exchange rate. The increase comes from either an appreciation of the exchange rate, E_j , or an appreciation of foreign price, P_j , depending on the variable.

The impact of oil price on the real effective exchange rate is an empirical issue. Since the United States is a net oil-importing country, an increase in the price of oil results in an increase in the cost of imports of oil. Buying the oil requires a sale of domestic currency and a purchase of foreign currency. Consequently, E_j will go up. This increase yields an increase in the real effective exchange rate. Simultaneously, however, a higher oil price results in a higher cost schedule for each industry, and therefore higher US prices. This means that P will go up. The resulting increase in the denominator yields a decrease in the real effective exchange rate. The impact of oil price on the real effective exchange rate depends on these two opposite effects. This means that the overall impact cannot be explained theoretically and is thus an empirical issue. Finally, monetary policy transparency, as measured by the Kia Index, negatively impacts the real effective exchange rate. One explanation, the most intuitive, is that more transparency in monetary policy reduces risk and uncertainty, which results in more investment and attracts more international investors.

Consequently, demand for the US dollar will go up, which results in a higher value of US dollar. In other words, E_j gets smaller, and so does the real effective exchange rate.

IV. Data and Estimation

A. Data

The majority of data were retrieved from the Federal Reserve Economic Database (FRED). Data for the European Union (EU debt per GDP and EU foreign-financed debt per GDP) were retrieved from the European Central Bank Statistical Data Warehouse. Quarterly data is used for the period 1994Q4:2014Q4. The author is aware of the seemingly limited time period, which is due to the formation of the European Union, whose fiscal variables should be included in this paper. The importance of the inclusion of EU data in this model has already been addressed.

It should also be noted that the two data taken from the European Central Bank Statistical Data Warehouse were only available as annual data for the entire period. Only more recent data were available at higher frequency. The annual data were interpolated from low-frequency to high-frequency using the RATS (Regression Analysis of Time Series) version 9 software package. All estimations were completed in this software, except for the long-run estimations using the ARDL approach to cointegration, as advanced by Pesaran and Shin (1999). These estimations were completed in the Microfit 5.0 software package.

Table 1*: Stationary Tests: 1994Q2 – 2014Q2 Absolute Values

Variables	Augmented Dickey-Fuller τ -Stat	Phillips-Perron τ -Stat	Zivot-Andrews τ -Stat
<i>lreer</i>	1.21	1.21	3.13 at 1997Q4
<i>lwp</i>	2.42	2.51	4.02 at 2005Q1
<i>lrm^s</i>	1.26	1.99	2.50 at 2008Q4
<i>li</i>	0.44	0.03	4.85 ^b at 2008Q4
<i>ly</i>	2.29	2.72	3.91 at 2008Q1
<i>lrg</i>	1.37	1.43	2.97 at 2011Q1
<i>defgdp</i>	1.39	1.52	3.30 at 2008Q1
<i>debtgdp</i>	0.63	1.23	6.25 ^a at 2008Q3
<i>fdgdp</i>	0.63	1.08	3.78 at 2008Q3
<i>li*</i>	0.10	0.36	4.31 at 2009Q1
<i>debtgdp*</i>	0.72	0.70	5.84 ^a at 2009Q1
<i>fdgdp*</i>	0.53	0.53	6.11 ^a at 2010Q1
<i>loil</i>	1.72	1.53	4.43 ^a at 2004Q3
<i>index</i>	5.27 ^a	5.50 ^a	3.78 at 2004Q4

Notes: $l(X) = \log(X)$. Variable *reer* is the real effective exchange rate for the United States (calculated as the weighted average of bilateral exchange rates, where the exchange rate is defined as the domestic price of foreign currency), *wp* is the world price index, *rm^s* is real money supply, *i* is gross interest rate (calculated by $[r/(1+r)]$, where *r* is US three-month Treasury bill rate), *y* is US real GDP, *rg* is US real government expenditure, *defgdp* is US deficit per GDP, *debtgdp* is US domestic debt per GDP, *fdgdp* is US foreign-financed debt per GDP, *i** is the foreign gross interest rate (calculated by $[r^*/(1+r^*)]$, where *r** is the EU three-month offer rate, LIBOR), *debtgdp** is EU domestic debt per GDP, *fdgdp** is EU foreign-financed debt per GDP, *loil* is real oil price, and *index* is the Kia Index.

* All tests include constant and trend. The critical value for the Augmented Dickey-Fuller τ test is 2.89 at 5% and 3.51 at 1%. The critical value for the Phillips-Perron non-parametric Z test is 2.89 at 5% and 3.51 at 1%. The number of observations is 81. The critical value for Zivot-Andrews Unit Root Test is 4.80 at 5% and 5.34 at 1%. The number of usable observations is 80.

a = Significant at 1%.

b = Significant at 5%.

Table 1 shows the results of stationary tests. For robustness, Augmented Dickey-Fuller (1979), Phillips-Perron (1988), and Zivot-Andrews (1992) tests were used. From the table, the stationary tests indicate that the model includes both stationary and non-stationary variables, with most being non-stationary. Data were transformed to meet the same criteria as the Kia (2013) exchange rate determinant model. Table 2 provides summary statistics on the transformed data.

Table 2: Summary Statistics of Variables for Real Effective Exchange Rate Model
Sample Period: 1994Q2–2014Q2

Variable	Mean	Std. Error	Minimum	Maximum
<i>lreer</i>	4.680	0.088	4.535	4.858
<i>lwp</i>	1.473	0.399	0.887	2.384
<i>lrm^s</i>	6.609	0.162	6.440	7.072
<i>Li</i>	-0.947	1.118	-3.932	-0.154
<i>Ly</i>	9.484	0.144	9.185	9.681
<i>lrg</i>	4.142	0.355	3.554	4.679
<i>defgdp</i>	0.007	0.007	-0.006	0.023
<i>debtgdp</i>	69.660	15.559	53.832	103.269
<i>fdgdp</i>	17.578	8.397	8.925	34.910
<i>li*</i>	-0.519	0.472	-1.609	-0.141
<i>debtgdp*</i>	73.795	8.279	64.992	92.053
<i>fdgdp*</i>	9.914	6.529	3.709	23.475
<i>loil</i>	-1.527	0.551	-2.577	-0.468
<i>Index</i>	90.666	8.679	63.988	99.807

Notes: $l(X) = \log(X)$. Variable *reer* is the real effective exchange rate for the United States (calculated as the weighted average of bilateral exchange rates, where the exchange rate is defined as the domestic price of foreign currency), *wp* is the world price index, *rm^s* is real money supply, *i* is gross interest rate (calculated by $[r/(1+r)]$, where *r* is US three-month Treasury bill rate), *y* is US real GDP, *rg* is US real government expenditure, *defgdp* is US deficit per GDP, *debtgdp* is US domestic debt per GDP, *fdgdp* is US foreign-financed debt per GDP, *i** is the foreign gross interest rate (calculated by $[r^*/(1+r^*)]$, where *r** is the EU three-month offer rate, LIBOR), *debtgdp** is EU domestic debt per GDP, *fdgdp** is EU foreign-financed debt per GDP, *loil* is real oil price, and *index* is the Kia Index.

B. Long-Run Estimation

As an extension to the Kia (2013) model, which is a theoretical monetary model of the real exchange rate, this model incorporates the Kia Index, which is stationary. For this reason, I used the Fully Modified-Ordinary Least Squares (FM-OLS) estimation, originally developed by Phillips and Hansen (1990). Further, I used Akaike Information Criterion (AIC) and Schwartz Bayesian Information Criterion (SBIC) to determine lag length. Based on these tests, 7 lags of quarterly observations were used in the FM-OLS regression.

Table 3 gives the output of the Fully Modified-Ordinary Least Squares regression. The explanatory variables are statistically significant with the exception of US real government expenditure, US budget deficit per GDP, and US government debt per GDP. As theoretically predicted, the coefficients have the correct signs. The impact of oil price on the real effective exchange rate is negative. This relationship means that the impact of a higher US price (denominator) is greater than the impact of a higher exchange rate (numerator), and so the net effect is negative, or the net effect results in a decrease in the real effective exchange rate.

Table 3: Fully Modified-Ordinary Least Squares Regression Output

Dependent Variable: <i>lreer</i>	Lag Length: 7													
Variable	<i>lwp</i>	<i>lrm^s</i>	<i>li</i>	<i>ly</i>	<i>lrg</i>	<i>defgdp</i>	<i>debtgdp</i>	<i>fdgdp</i>	<i>li*</i>	<i>debtgdp*</i>	<i>fdgdp*</i>	<i>loil</i>	<i>index</i>	<i>Con</i>
β Coeff.	0.0585	0.1990	0.0278	0.6177	0.0051	-0.2661	-0.0017	0.0181	0.0481	0.0087	0.0058	0.1326	0.0797	0.1644
(τ -stat)	(-7.62)	(-3.88)	(-5.16)	(6.12)	(0.95)	(-0.732)	(-3.65)	(-6.36)	(2.57)	(5.71)	(5.55)	(-15.6)	(-2.96)	(0.11)

The sample period is 1994Q2–014Q2. $l(X) = \log(X)$. Variable *reer* is the real effective exchange rate for the United States (calculated as the weighted average of bilateral exchange rates, where the exchange rate is defined as the domestic price of foreign currency), *wp* is the world price index, *rm^s* is real money supply, *i* is gross interest rate (calculated by $[r/(1+r)]$, where *r* is US three-month Treasury bill rate), *y* is US real GDP, *rg* is US real government expenditure, *defgdp* is US deficit per GDP, *debtgdp* is US domestic debt per GDP, *fdgdp* is US foreign financed debt per GDP, *i** is the foreign gross interest rate (calculated by $[r^*/(1+r^*)]$, where *r** is the EU three-month offer rate, LIBOR), *debtgdp** is EU domestic debt per GDP, *fdgdp** is EU foreign-financed debt per GDP, *loil* is real oil price, and *index* is the Kia Index.

Dummy variables were created to represent potential policy regime shifts and exogenous shocks. The following dummies were constructed: *sep11* (=1 for 2001Q4 and zero otherwise), *afwar* (=1 since 2001Q4 and zero otherwise), *bern* (=1 from 2006Q1 to 2014Q1 and zero otherwise), and *crisis* (=1 from 2007Q3 to 2009Q2 and zero otherwise); where *sep11*, the terror attack on September 11; *afwar*, the War in Afghanistan; *bern*, the tenure of Federal Reserve Chairman Ben Bernanke, and *crisis*, the financial crisis. All of the dummy variables are statistically insignificant. It is worth mentioning that the dummies were expected to be statistically insignificant given that Kia (2011) developed the transparency index in such a way to account for all policy regime changes and shocks.

For robustness, I used the ARDL approach to cointegration, as advanced by Pesaran and Shin (1999) to measure the long-run relationship as it was explained before. This was completed using the Microfit 5.0 software package. The main advantage to this testing and estimation strategy is that the method can be applied irrespective of whether the explanatory variables are *I*(0) or *I*(1). There are a few restrictions worth noting when using the ARDL approach, namely there is a limit to the number of variables one can use, and critical values are given based on the assumption of variables being *I*(0) or *I*(1). That is to say, if a variable is *I*(2), it is not appropriate for the estimation. To meet these requirements, statistically insignificant variables must be removed. Thus, a parsimonious result is reported. These tests are not reported here, but are available upon request. Table 4 reports the ARDL estimates.

It may be useful to give a brief and simple explanation to the ARDL approach to cointegration, which explanation is borrowed from Pesaran and Pesaran (2009). The existence of a long-run relationship between the variables is tested by computing the *F*-statistic for testing the significance of the lagged levels of the variables in the error correction form of the underlying ARDL model. It must be noted that the distribution of this *F*-statistic are non-standard, irrespective of explanatory variables being either *I*(0) or *I*(1), and Pesaran *et al.* (1996) have formulated the appropriate critical values for different numbers of variables. Two sets of critical values are given: one assuming that all of the variables in the ARDL are *I*(0), and the other assuming all the variables are *I*(1). This process provides a band covering all the possible classifications of the variables into *I*(0) or *I*(1). If the *F*-statistic falls outside the band, then a conclusive decision can be made. An *F*-statistic above the upper bound means that the null hypothesis of no level relationship is rejected. An *F*-statistic below the lower bound means that the null hypothesis of no level relationship cannot be rejected. And finally, an *F*-statistic between the bounds means that the test is inconclusive.

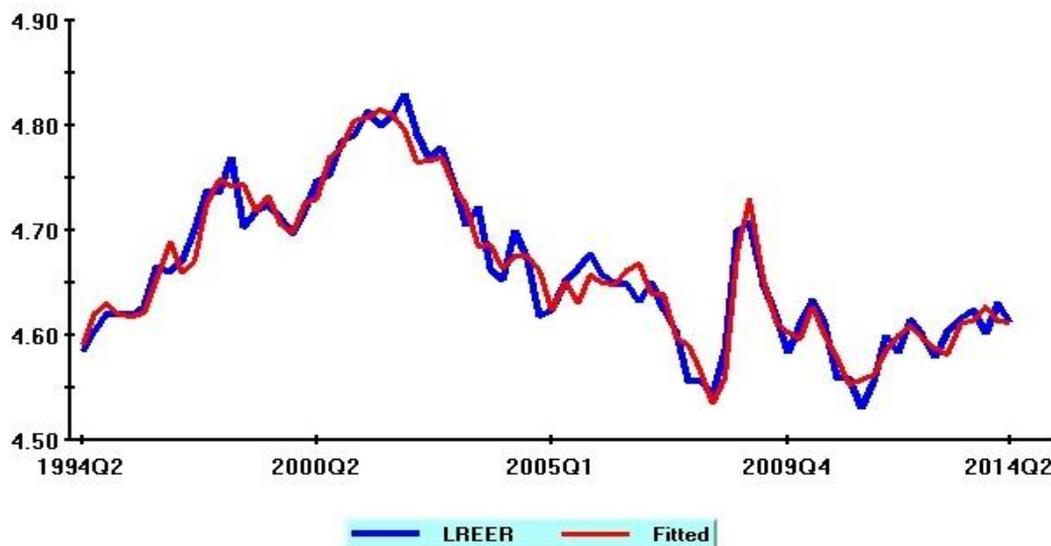
**Table 4: Autoregressive Distributed Lag Estimates^a
ARDL(1,0,2,1,2,1,2) Selected Based on Akaike Information Criterion**

Dependent Variable: <i>lreer</i> Sample Period: 1994Q2-2014Q2				
Variable	Coefficient		Standard Error	
<i>lreer</i> _{<i>t</i>-1}	0.5089		0.10	
<i>lwp</i>	-0.0344		0.02	
<i>li</i> _{<i>t</i>-1}	-0.0321		0.01	
<i>ly</i>	-1.9954		0.52	
<i>ly</i> _{<i>t</i>-2}	1.4056		0.60	
<i>fdgdp</i>	-0.0169		0.01	
<i>fdgdp</i> _{<i>t</i>-1}	0.0131		0.01	
<i>fdgdp</i> [*] _{<i>t</i>-1}	0.0061		0.00	
<i>loil</i>	-0.0854		0.02	
<i>loil</i> _{<i>t</i>-1}	-0.0091		0.02	
<i>loil</i> _{<i>t</i>-2}	0.0617		0.02	
<i>lindex</i>	-0.0872		0.04	
Testing for the existence of a level relationship among the variables in the ARDL model ^b				
<i>F</i> -statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
6.3809	3.5151	4.6262	3.0496	4.0607
<i>W</i> -statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
44.6662	24.6056	32.3836	21.3471	28.4252

^aOrder or ARDL = 2. ARDL estimation involved 2187 regressions. For definitions of variables, see notes in Table 2. The model passed all diagnostic tests (e.g. misspecification, ARCH, normality, heteroscedasticity). The CUSUM and CUMSUMSQ tests using OLS estimation tested for stability. Results of these diagnostic tests are available upon request. *W*-statistic is the Wald test for linear and non-linear restrictions on the coefficients. The intercept and trend were statistically insignificant.

^bThe critical value bounds are computed by stochastic simulations using 20,000 replications.

Table 4 reports the parsimonious ARDL estimates. From the *F*-statistic, the hypothesis of no level relationship is rejected. In other words, there exists a long-run relationship among the variables in the ARDL model. The table indicates that world price, US interest rate, US growth, US government foreign-financed debt, oil price, EU public foreign-financed debt, and the Transparency Index significantly impact the real effective exchange rate for the US over the long run. For the sake of graphical representation, Figure 2 plots of actual and fitted values for the ARDL model.

Figure 2: Plot of Actual and Fitted Values of LREER

With a long-run relationship of the variables given by the ARDL model, a long-run response can be calculated for the explanatory variables. While the response can be computed for all variables, only those that are statistically significant (variables from Table 3) are reported here. Table 5 reports the estimation results.

Table 5: Long-Run Response from ARDL Estimates^a

Variable	<i>lwp</i>	<i>li</i>	<i>ly</i>	<i>fdgdp</i>	<i>fdgdp*</i>	<i>loil</i>	<i>lindex</i>
LR Response	-0.06775	-0.07678	0.88294	-0.00755	0.00741	-0.08233	-0.17124
(τ -stat)	(-1.96)	(-2.80)	(2.36)	(-2.74)	(1.94)	(-4.31)	(-2.17)

^a Autoregressive and distributed lag polynomials are extracted from the ARDL regression. The distributed lag polynomial is then divided by the autoregressive polynomial. Long-run responses reported are for statistically significant variables. For definitions of variables, see notes in Table 2.

LR = Long Run. The sample period is 1994Q2-2014Q2.

It should be noted that as an added measure of robustness, ARDL models were constructed in both RATS 9.0 and Microfit 5.0 software packages. That is, both traditional and bounds testing strategies for ARDL models were used in testing for the long-run relationship. Both of these approaches yielded long-run relationships consisting of the same variables. Long-run responses were computed for both methods and were identical in sign and similar in value. For example, the long-run response for world price, *lwp*, is -0.06775 using the bounds testing method, compared to -0.06872 using the traditional method. The long-run response for the transparency index, *lindex*, using the traditional method is -0.16225. A full comparison of the long-run responses for both methods is available upon request.

C. Short-Run Dynamics

Having established in the previous section that a long-run relationship describing the real effective exchange rate and its determinants exists, it is necessary to specify the ECMs (error correction models) that are implied by the long-run relationship. Following Granger (1986), it should be noted that if small equilibrium errors in the market are overlooked, while large equilibrium errors are recognized and markets react substantially to these, then the error correcting equation is non-linear. Thus, different possible kinds of non-linear specifications (e.g. squared, cubed and fourth powered) of the equilibrium errors were included. To avoid biased results, a large lag profile is necessary, and lags were determined using AIC and SBIC. These tests determined a lag profile of seven quarters. Additionally, since having too many coefficients can lead to inefficient estimates, I ensure parsimonious estimation by selecting the final ECM on the basis of Hendry's General-to-Specific approach. Assuming US government expenditures, US government foreign-financed debt per GDP, foreign variables (excluding foreign interest rate¹), and the Transparency Index are exogenous, there are eight endogenous variables in the system. Therefore, there are eight error-correction models. For the sake of brevity, I only report the parsimonious ECM for the growth of the real effective exchange rate. Table 6 reports the parsimonious results of the estimation of the ECM.

Table 6: Error Correction Model for the Growth of the Real Effective Exchange Rate
Dependent Variable = $\Delta lreer^a$

Variable	Coefficient	Standard Error	Hansen's (1992) stability L _i test (<i>p</i> -value)
$\Delta lreer_{t-6}$	0.21	0.11	0.99
Δli_{t-2}	-0.03	0.01	0.97
Δli_{t-3}	-0.03	0.01	1.00
Δly_{t-2}	1.72	0.64	0.24
$\Delta loil_{t-2}$	0.04	0.02	0.57
$\Delta loil_{t-3}$	0.05	0.02	0.85
$\Delta lindex_{t-1}$	-0.10	0.04	0.21
$\Delta lindex_{t-2}$	-0.12	0.05	0.18
$\Delta lindex_{t-3}$	-0.15	0.05	0.24
$\Delta lindex_{t-4}$	-0.11	0.04	0.80
EC _{t-7}	-0.34	0.12	0.82
(EC) ² _{t-2}	0.82	0.22	0.84

Hansen's (1992) stability L_i test for the variance of the ECM = 0.25

Joint (coefficients and the error variance) Hansen's (1992) stability L_c test = 0.87

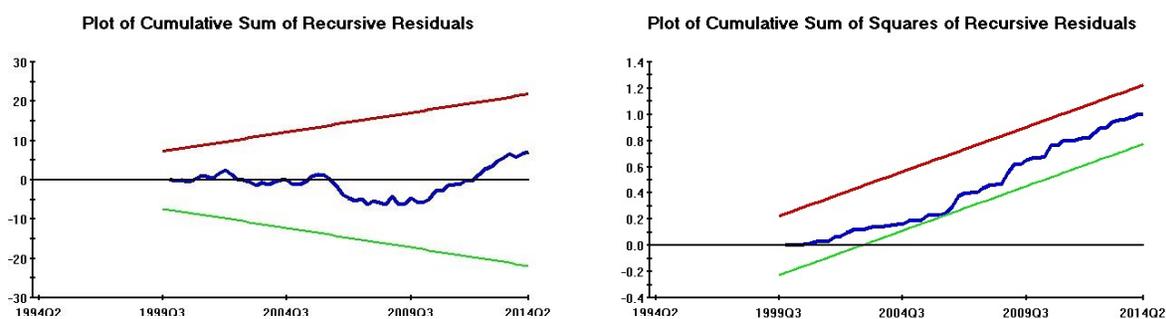
^a The sample period is 1994Q2 to 2012Q2. Δ is the first difference, mean of the dependent variable = -0.0001. Constant term = 0.02, and statistically insignificant. Variable EC is the error correction term from the long-run relationship. For the definitions of the other variables see notes in Table 2. The estimation method is Ordinary Least Squares. $R^2 = 0.47$, $\sigma = 0.026$, DW = 2.18, Godfrey (6) = 0.78 (significance level = 0.58), White = 71 (significance level = 1.00), ARCH(5) = 6.41 (significance level = 0.27), RESET(3) = 1.62 (significance level = 0.20), Normality ($\chi^2 = 2$) = 0.27 (significance level = 0.87).

⁵ Since the United States is a large country, the foreign interest rate can be influenced by US variables. Therefore, the foreign interest rate is endogenous.

In Table 5, Δ denotes a first difference operator and EC, R^2 , σ , and DW, respectively, denote the error correction term from the long-run equation for the real effective exchange rate, the adjusted squared multiple correlation coefficient, the residual standard deviation, and the Durbin–Watson statistic. White is White’s (1980) general test for heteroscedasticity, ARCH is five-order Engle’s (1982) test, Godfrey is five-order Godfrey’s (1978) test, RESET is Ramsey’s (1969) misspecification test, Normality is Jarque-Bera’s (1987) normality statistic, L_i is Hansen’s (1992) stability test for the null hypothesis that the estimated i th coefficient or variance of the error term is constant and L_c is Hansen’s (1992) stability test for the null hypothesis that the estimated coefficients as well as the error variance are jointly constant.

From the table, the diagnostic tests for specification are statistically insignificant. The Hansen stability test indicates that coefficients, individually or jointly, are stable. Furthermore, Figure 3 shows the results of CUSUM and CUSUMSQ tests for stability. The tests indicate that the error correction model is stable.

Figure 3: CUSUM and CUSUMSQ Plots^a



^a The straight lines represent critical bounds at the 5%.

From the error correction model, none of the domestic fiscal variables has any impact on the growth of the real effective exchange rate in the short-run, while interest rate, growth, oil and monetary policy transparency do. The estimated coefficient of the error correction term is negative and statistically significant. Furthermore, the impact of the equilibrium error is non-linear, given that squared error term is statistically significant. And since the coefficient is positive, this implies that market agents may ignore small deviations from equilibrium and react drastically to large deviations. However, a large deviation can create further deviation. The growth of the interest rate impacts the growth of the real effective exchange rate as expected, as does real GDP. The change in oil price, in the short-run, has a positive impact on the real effective exchange rate. The sign is contrary to the long-run situation. However, as explained, oil price exhibits two opposing effects. The ECM implies that in the short-run, oil’s impact on the exchange rate, E_i , increases the real effective exchange rate. In the long-run, however, oil’s impact on the domestic price, P_i , results in a net negative effect. Monetary policy transparency impacts the real effective exchange as expected. In both the short- and long-run, the change in transparency negatively impacts the change in the exchange rate, implying that an increase in monetary policy transparency, everything else being equal, attracts market participants and international investors, thus an increase in the value of the US dollar and the subsequent decrease in the real effective exchange rate. Also, according to the error correction model, monetary policy transparency can affect the real effective exchange rate for four quarters, or one year.

V. Conclusion

While the literature is well-furnished with studies of both monetary policy transparency and the behavior of foreign exchange rates, there are relatively few studies in the literature that attempt to combine the two. One explanation is that no objective monetary policy transparency index existed before Kia's work in 2011. Therefore, it is possible that researchers could not objectively study the impact of transparency on exchange rates. This paper does so by adopting the methodology of Kia (2013), in which Kia developed a theoretical monetary model of the real exchange rate that incorporates fiscal and monetary factors, and by borrowing elements from Wilson's (2009) monetary approach to exchange rate determination model. Following these methodologies, this paper examines the impact of monetary policy transparency on the real effective exchange rate, with monetary policy transparency measured by the index developed by Kia (2011), an index that is market-based, objective, dynamic, and continuous.

This study finds that the transparency index is statistically significant in measuring the impact of monetary policy transparency on the real effective exchange rate for the United States. Furthermore, using both the Fully Modified-Ordinary Least Squares estimation and the ARDL approach to cointegration advanced by Pesaran and Shin (1999), this study finds that monetary policy transparency has a negative impact on the real effective exchange rate, that is, a more transparent monetary policy attracts more domestic and international investors. This creates higher demand for the currency and leads to a higher value of the US currency and thus a lower real effective exchange rate. Additionally, this study finds that oil price has a negative impact on the real effective exchange rate in the long run and a positive impact in the short-run, and that oil is statistically significant in both situations. While oil price impacts both price level and exchange rate, the impact on the US price is greater than the impact on the nominal exchange rate. Consequently, the net effect of the change in the oil price over the long run is negative, or the net effect results in a decrease in the real effective exchange rate for the United States.

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The Evolving Financial Services Industry: The Financial Advisory Role Today and in the Future

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Cyber security is emerging as a leading corporate and government issue, and it will be the topic at the forefront of the financial services industry's list of concerns in the years to come. Data management and solutions companies stand poised to take advantage of these changes within the industry. The authors will develop a new consumer model which we believe will be adopted in the financial service industry by the year 2020. The impact these changes will have on the financial advisor/client relationship remains to be seen.

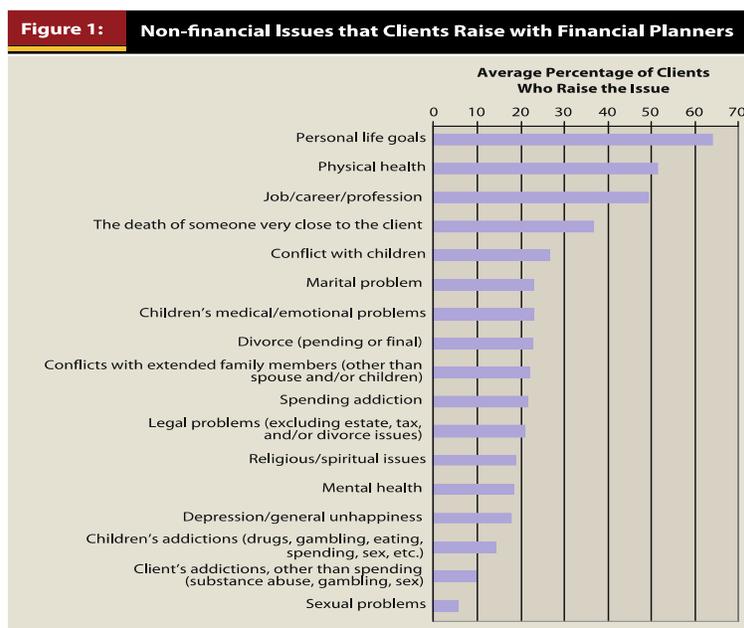
Keywords: Data Management, Financial Services Industry, Consumer Model

JEL Classification: G

I. Introduction

Financial advising has traditionally been thought of as a career dealing strictly with investment strategies and financial figures. In recent years this career has added yet another role, that of life coach. Dealing with an individual's or family's financial situation involves very personal issues, which has led clients to share more information about their private lives. In a study performed by Dubofsky and Sussman (2009), one response to a general comment section of a questionnaire stated: "When someone trusts you enough to open up about finances, usually they will open up about other more personal issues." From the results of their study it was found that out of the 1,374 financial advisors surveyed, over 74 percent have seen an increase in dealing with non-financial issues with over 25 percent of their time on an average day being spent on non-financial issues (Dubofsky and Sussman, 2009). The non-financial issues of clients that financial advisors have been facing are diverse, ranging from personal health to religious or spiritual issues. The chart below illustrates how financial advisors are expanding their role further than ever before, raising ethical questions on whether financial advisors are qualified to handle such personal life issues.

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Figure 1: Non-Financial Issues that Clients Raise with Financial Planners

Source: Dubofsky and Sussman (2009).

The financial advisor's role as a life coach will continue to develop as more aspects of their clients' lives become a part of their financial plan. Multiple clients looking for financial assistance with regard to their personal lives are seeking saving strategies for their children's education and for supplemental income for lifestyle expenditures. We believe that the financial advising role will continue to develop along the life-coach path for another four to five years before technology once again will change the sector as we know it. For the next four to five years, the financial advising sector will still need to answer the question of whether it is ethical for finance professionals to be handling matters involving life issues. To address this challenge, it will be essential for advisors to enroll in life-coaching classes that cover the aspects of self-awareness, social awareness, self-management, and relationship management. According to Dubofsky and Sussman's study (2009), only 40 percent of financial advisors surveyed had taken any courses covering the previously listed issues necessary to conduct their role in a professional manner. With more and more individuals searching for financial advice, it will become imperative that advisors be equipped with the necessary means to handle personal situations as well.

Clients are faced with personal situations that require the use of advisors throughout their lives, and as the financial world becomes more complex in the future, they will turn to advisors more frequently. Advisors will have to prepare for the changing needs of their clients and be able to meet these needs. Further improving the emotional awareness of financial advisors will enable them to meet the needs of their clients, which would in turn increase customer satisfaction. According to the study performed by Dubofsky and Sussman (2009), financial advisors saw increased business because of their non-financial activities in 40 percent of cases.

The proactive approach financial advisors would take – completing classes to improve their non-financial counseling – will meet their clients' needs for the time being. As technology continues to advance the clients' requests will continue to advance as well. By the year 2020 and beyond, we believe that there will be a substantial change within technology that will make

financial decisions and information even more accessible, giving clients more transparency when dealing with personal life issues.

II. Future Trends in Financial Services

The digital revolution has brought about unprecedented changes to every sector of the U.S. economy, and the financial services industry has been impacted more than just about any other sector of the economy by this development. Advanced information systems have been adopted by transfer agencies and payment processing centers. Mobile and electronic banking is becoming vastly more prominent than banks' physical branches. Fund management and even financial advising are becoming more software and algorithm driven. Trading has been overtaken by high-frequency traders and their high-powered computing capabilities. The present state of the world is undeniably reliant upon computers, software, and advanced networks that help to keep them closely interconnected, and the financial sector is inseparable from this state of affairs. These technological developments have been largely beneficial and progressive, but they do not come without challenges. The rise of digital based alternatives to traditional financial services activities has brought about a new environment within which finance companies must compete.

Within the last couple of decades, the financial landscape has been completely altered. Not long ago, online banking and trading platforms were huge innovations. Now, it is all but commonplace for banking, trading, and account management to appear right at an individual's fingertips on mobile devices. Physical offices and branches are seen as less necessary as well as costly; their growth has slowed as the need for them diminishes (KAW, 2014). The human element is becoming less and less prevalent while the technological element grows exponentially. From the consumer perspective, this is no great loss. As millennials make up a larger portion of the U.S. consumer base and workforce, cultural desires and needs will shift dramatically (Lynch, 2013). These consumers are focused on three trends: (1) efficiency and speed, (2) transparency and fewer layers of bureaucracy, and (3) lower fees and fewer unnecessary expenses (Booz Allen Hamilton, 2014).

The world is becoming more digitized as individuals expect activities to become quicker, easier, and more streamlined. After all, the whole point of technological innovation is to decrease human inputs while simultaneously increasing outputs. The new generation, in particular, has little patience for the inter-workings of large corporations. Requests should be processed immediately, accounts should be opened instantaneously, and payments should clear promptly. These expectations are the curse of being brought up in a world where technological innovations have occurred more rapidly than at any other time throughout human history; the present status quo is never enough. These expectations have formed a new paradigm within which financial services companies and indeed all companies must do business.

Efficient in the consumer's eye means whatever is convenient at the time, and to be convenient at all times, finance companies must offer their services across all platforms. That must include developing products for the platforms of the future, be it the Apple Watch, Google Glass or something yet to be created. Each new addition to the arsenal of consumer tech brings about a change to consumers' lifestyles and ways of performing everyday activities (KAW, 2014). It is difficult for a finance company to call itself efficient and up to date if it doesn't have an app on the latest digital platform.

A desire to increase speed necessitates that transactions, processing procedures, and even fundamental financial functions such as clearing checks or crediting accounts be completely

reevaluated. Processes can only be refined up to a point, and when that point is reached, a new process must be developed if further progress is to be made. The fact of the matter is, new entrants into the financial world will find a way to perfect systems and refine current best practices. As these newly created methods become the norm, the old and snail's pace forms of conducting commerce will fall by the wayside, as will the companies that fail to change with the times. Upon evaluation of current procedures, it becomes evident that the future will entail more programs, more algorithms, more artificial intelligence, and fewer human beings. Compared to a properly coded and run program, humans make substantially more errors and take much longer. Technology's purpose is speed and efficiency, and these objectives will be accomplished through its continued implementation.

Computers will continue to replace humans in positions involving data entry and financial transfers; the issue of too many bureaucratic layers should correct itself. As fewer individuals are needed to touch papers and view electronic documents, the time it takes to complete client requests and routine tasks will be dramatically reduced. However, the resolution of one headache may lead to another. The consumer desire to deal with fewer people may create a situation in which their other desire for transparency becomes more difficult to achieve. As computers pick up more and more of the workload, there will be less explanation and clarity as to what is taking place.

Unless there is adequate human oversight, there may actually be less transparency than before. The need for transparency all ties back to the great mistrust the general populace has for the financial industry. According to the Harris Reputation Quotient¹, only tobacco and government rank lower than financial services (Lynch, 2013). Especially during a time when the industry is rapidly changing due to technological innovation and new product development, the morality and integrity of companies going forward will be pivotal to their success. Unfortunately, there may be less of a reassuring human element at the exact time it is needed most. This is just one example of the difficulties companies face in appeasing consumers and their contradictory desires.

Part of the reason the younger generation is so focused on transparency is that they want to know exactly what they are paying for and why. Any random or conspicuous fee sets off warning sirens, and the impacts are powerful enough to turn customers away. As the financial industry becomes more democratized and commoditized, consumers are establishing low costs as their top priority (Booz Allen Hamilton, 2014). If two funds look similar, if two online trading platforms look similar, if two IRA custodians look similar, the one with the lowest fees will generally win.

It would appear that the elimination of human labor and the implementation of software would drive down costs and allow financial institutions to drop fees, but this may be an erroneous conclusion. The development, attainment, and maintenance of software, as well as advanced information systems, are very expensive. In many cases, small to medium institutions may postpone implementation because of the large costs (New York State Department of Financial Services, 2014). The revenues that banks use to fund these costs are generated from the fees they charge their customers, and financial services and solutions companies generate similar fees from their clients. The combination of downward fee pressure from consumers and upward cost pressure from technology-driven R&D makes for a volatile mix in the midst of threats from new entrants.

According to Berman (2015), Northwestern Mutual already has a personal finance site called the Mint GRAD, which is targeting college students and recent college graduates. This site features millennials who possess experience managing their student loans or addressing their undesirable credit card debt. Emily Halbrook, who is director of the young personal market for Northwestern

¹ <http://www.harrisinteractive.com/Products/ReputationQuotient.aspx>.

Mutual, says that “peer-to-peer contact and investment content are really important.” These posts can assist young adults and potentially capture clients for life insurance, a core product, by stressing how it can benefit millennials today and not just in 50 years in the future (Berman, 2015).

A robo-savings tool labeled DIGIT nudges users, who are an average age of 27, to think more about saving and investing money. Ethan Block, who is the 30-year old CEO of DIGIT, says the inspiration for this product came from his observing his friends working diligently at decent paying jobs, but struggling to relieve themselves of student loans or credit card loan debt. DIGIT links to users’ bank accounts and periodically puts away small sums of savings. Berman (2015) believes this robo account is one of many to come to the market in the future.

In a *Wall Street Journal* article, Tergesen (2015) talks about the growing future trend for robo investment advice to join an industrywide trend toward lowering investment minimums, in an effort to attract more millennials as investors.

Personal Capital, a San Francisco firm that manages approximately \$1.8 billion, recently reduced the minimum required to open an account to \$25,000 from \$100,000. Tergesen (2015) states that Personal Capital’s average client is 42 years old, and the firm desires to lower their average client’s age in the future. CEO Bill Harris believes that these young people are in the earliest stages of their careers and lives, but they are on the road to build significant financial futures for themselves. Tergesen sees many attempts by robo advisors, a broad category that would include companies that offer fully automated services and financial advice, as well as “hybrid” advisors such as Personal Capital that combine computerized services with hand-holding from human advisors.

Currently, Fidelity Investments has commenced testing its own robo product called Fidelity Go, utilizing a small group of company employees. Personal Capital is following the trend to lower minimum fees – lower than the Vanguard Group’s hybrid Vanguard Personal Advisor Service, which recently reduced its minimum from \$100,000 in the pilot program to \$50,000 now. Personal Capital’s minimum has been lowered to below the Vanguard Group’s minimum. The Vanguard program boasts \$26 billion in assets, by far the highest in the industry. The importance of capturing the millennials’ investing business is apparently not a flash-in-the-pan commitment. We should all expect more competition and lower fees in the future. In fact, Wealthfront Inc., with approximately \$3 billion under management, recently reduced its required minimum investment to just \$500, while Bettermint LLC, which manages a similar amount of money, has no minimum required to open an investment account, but does require a \$100 automatic monthly deposit for accounts below \$10,000 in order to eliminate a \$3 monthly fee. The trends are obviously showing lower minimums and fewer fees – exactly what the millennials are looking for. The robo accounts can help attract funds while keeping costs lower – they are building scale (Tergesen, 2015).

Irvin Wladawsky-Berger, who worked for IBM for 37 years and who is affiliated with MIT, NYU, and Imperial College, believes that beyond technology, the evolution of financial services will be influenced by various social, political, and economic factors in the future. He lists four possible future scenarios predicated on different combinations of two vital factors: the rate of technological innovation and the number of financial suppliers. The four possible future scenarios are as follows: rapid change/many suppliers, rapid change/fewer suppliers, slow change/many suppliers, and slow change/few suppliers (Wladawsky-Berger, 2015).

The rapid change/many suppliers scenario shows many existing financial services providers going out of business, with those companies being replaced by new digital entrants. Under this scenario, the new demand, along with uncertainty about the future, will predominate – this sounds familiar. The rapid change/few suppliers system leads to a few major information and

communication technologies (ICT) – e.g., Amazon, Apple, and Google – while traditional financial institutions unable to compete will simply fade away. The customers under this system operate as passive consumers. The slow change/many suppliers paradigm shows that periods of rapid ICT and financial services innovation are followed by long periods of stability and consolidation, where privacy and security will become key competitive advantages. The new suppliers will eventually replace present players who try to reinvent themselves as niche providers or owners of declining profitable asset bases. There is no one supplier who will achieve market dominance. The slow change/few suppliers environment is basically where we are today. Technologies are advancing rapidly, but social factors and privacy issues are constraining the speed of growth. There are a few firms that will emerge in technology ecosystems and financial services. Until the trust issue is satisfactorily addressed, progress will be slower than desired. When trusted relationships are established, then the ecosystems will develop their own long-term savings and investment policies. The transactional payments will be performed usually by new entrants who will exploit existing schemes to maximize data value. The future most likely will not look like any one of these scenarios according to Wladawsky-Berger (2015), but will be an amalgam of all four scenarios. He concludes that the future will change the very nature of money, payments, and identity. The trust relationship will undergo changes never seen before. The future of financial services in the decades ahead will be a challenging journey – changing future generations’ demands for these products.

III. Wall Street vs. Fintech

Venture capitalists and Silicon Valley are becoming ever more involved in the evolving field of finance. There is no shortage of start-ups looking to revolutionize the way commerce is conducted and money is handled, and such enterprises are expected to only grow in number. These operations have been dubbed “Fintech,” and Fintech is the David hoping to fell the Goliath that is Wall Street (Roose, 2014). Challenging the financial sector head on has never been advisable, for these institutions have massive amounts of capital as well as political clout that they can use to help shape their own destinies.

However, the new technological environment driven by consumer desires is setting up the perfect scenario for an innovative and creative player to take a bite out of the market. People rely on and supposedly like the current systems for automobiles and hotels, yet Uber and Airbnb have made waves within their respective industries (Roose, 2014).

The strongest card that Fintech companies possess may be nothing more than a reiteration of the past. Wall Street, despite being an integral and ingrained part of our society, has a black cloud hanging over its head. It is viewed as an industry full of unchanging, hidebound, rigid companies perceived as fee-hungry giant corporations. Emerging technology companies entering the field of finance have little to overcome from a perception standpoint; they are perceived as sleeker, more efficient, and actually more trustworthy compared to the large players (Lynch, 2013).

According to Rajesh Jayaraman, a Fintech entrepreneur, all financial institutions need to do is move bits around (Roose, 2014). There is rarely any physical product, and as banking progresses, these firms are going to look more and more like software companies. Despite this trend, most traditional financial institutions utilize the same outdated infrastructure – paper checks, debit cards that require punched-in pins, and wire transfers that take days to clear. Meanwhile, venture capitalists are eager to throw their money at banking and financial alternative companies; U.S.-based Fintech start-ups raised an estimated \$1.3 billion in just the first quarter of 2014 (Roose,

2014). The huge financial support these companies are seeing represents just how badly the current system needs change, and it is only a matter of time before someone lands a critical blow to the \$1.2 trillion financial services industry (Roose, 2014).

It will be difficult and largely unprecedented for financial companies to slim down, streamline operations, and completely change focus to becoming software services providers. Such an endeavor actually looks quite hopeless in the face of such determined new entrants, but the fact of the matter is that this industry is still dominated by a few large players. The resources, politically established entry barriers, and capital access these large institutions possess are forces to be reckoned with. Their current course of action is to follow the greater corporate trend of buying up innovative start-up companies. By purchasing start-ups and Fintech companies, these financial institutions accomplish the dual mission of reducing competition while purchasing valuable patents and human capital that can be utilized to further their own innovation and development efforts.

Wall Street and its ancillary industries have rarely been in the forefront of innovation and change. If something works, they will sail the ship until it runs aground. Such a tactic is hardly optimal for the attainment of new clients and the retention of current ones. In an environment where consumers expect new products, new ways to access these products, and less unnecessary communication – all while paying less money – it simply does not pay off to be a laggard or even a fast follower. These emerging trends represent colliding and conflicting needs, and they do not get resolved by doing business as usual. The nature of the industry has progressed rapidly of late, and it is not going to slow anytime soon. In the midst of this whirlwind, the large financial institutions will be required to act more nimbly than they traditionally have.

The current and future developments in the financial services industry will help to bring about more efficient processes, more accessible information, and continued commoditization. These trends all converge to create a continuum spanning the gap between finance and technology, two essential facets of the modern world. The financial world will become a more technologically competent and consumer-conscious place, but with change comes challenge. As data continue to proliferate, transparency and security will clash; each step towards accessibility and convenience also brings the world closer to vulnerability. Corporations, particularly financial companies, are becoming the target of a new type of attack. These attacks will be waged in bits and over networks, and as technology becomes cheaper and more accessible, the potential number of combatants only increases. The warfare of the 21st century is cyber warfare, and it will be waged on the corporate battleground.

In December 2013, Target, Inc. announced that 40 million customers' credit and debit card information had been stolen. It would later be revealed that 70 million more had their personal information stolen (Walters, 2014). Recently Su Bin, a 49-year-old Chinese national, was indicted for the hacking of government defense contractors. Between 2009 and 2013, Bin's group attempted to steal manufacturing plans from companies such as Boeing and for defense programs such as the F-35 fighter jet (Walters, 2014). In June, personal information for over 80 million individuals and businesses was stolen from J.P. Morgan Chase. The hackers are believed to have originated in Russia and may have ties to the Russian government. In late November, Sony Pictures was hacked, and the fallout included the release of internal communications and sensitive company financial information (Walters, 2014).

Whether originating from foreign governments, competing corporations, or small groups of activists, cyber attacks are becoming both more common and more militaristic. The number of attacks will do nothing but increase from this point onward; this is merely the beginning of a hard-fought campaign.

Another disturbing realization is that financial companies will be nearly always involved, regardless of who the attacks take place against. It is becoming commonplace for Americans to receive letters in the mail from their banks stating that their card has been cancelled or their account has been frozen due to a compromise at some company or vendor. Banks and other financial institutions do not only have their own security concerns to worry about, but they also have to deal with the impacts of hacks on other businesses where their services or cards have been used. Moreover, financial companies are the most prominent direct target for a number of reasons.

Firstly, there is always the possibility that the worst case scenario will take place and actual funds are stolen by way of account takeovers or manipulation (Millman, 2014). It is likely that more activists likening themselves to modern bank robbers will appear in the near future. The proliferation of software managed accounts and data driven decision making will make such efforts all the more streamlined for would-be hackers.

Secondly, there is the crippling effect on capital markets that political opponents may wish to inflict upon certain institutions or even entire countries. If the services of a large financial institution are taken down for even a few hours, the implications become huge, from both an economic and psychological standpoint. There will be observable financial impacts due to a lack of access to funds, and perhaps more importantly, consumers will begin to lose faith in the abilities of companies to keep their money safe. A worst-case scenario would see a run on the banks while the banks have no access to the very funds their clients want.

This could be extended to an attack on established capital markets, including the stock market and all of the related investment banking and asset management activities. The implications of such an event would be catastrophic, seeing as markets react wildly to even minor glitches on exchanges or flash crashes driven by automated trading.

Another reason banks and finance companies are such prime targets is the breadth and depth of the information they possess. Information such as social security numbers, addresses, account numbers, PINs, dates of birth, and much more is necessarily kept on hand because of reporting requirements under the Patriot Act and related regulations. All this information is held in mainframes, databases, or in the cloud, and hackers will persistently try to access it.

If an activist group or foreign entity can successfully compromise companies or functions involved in the U.S. financial markets, then the geopolitical implications are enormous. Warfare is becoming ever more digitized, and this warfare spares nobody. Foreign governments will not just attack the U.S. government; indeed they may find it more effective to attack companies and leverage the damage they can cause to force the hand of the government (Camhi, 2014).

IV. Implications and Actions

It is unlikely that financial companies alone will be able to reshape themselves into organizations up to the task of combating cyber security threats. Fintech companies offer new possibilities, yet they are not established and face difficulties in overcoming the systemic advantages that large institutions possess (Roose, 2014). The future of the industry will not see the elimination of traditional Wall Street or finance, but these companies will, out of necessity, undergo developmental change and progression.

Small and large firms alike will require new services and solutions for handling challenges, and data and information processing companies stand poised to take advantage of these circumstances.

Despite changes they will undertake, banks and asset managers will survive out of necessity. Data management and financial transaction processing companies have the most to either gain or lose going forward. Their businesses consist of services and products involving mutual fund transaction processing, check handling, mail organizing, fund sub-accounting, and general data storage and management. Investment managers and banks will need to be reassured that these existing products are safe and that information is secure. If breaches occur on the back end, the fund company is the one that receives the flak from customers and the media, and in the investing field, perception and brand name are everything. Financial companies will become ever more cognizant of the way third parties process and organize information, and internal oversight will be increasing for both regulatory and competitive reasons (Camhi, 2014). While presenting new challenges, these changes provide an opportunity for third-party processors to prove why their services are necessary. This can be effectively accomplished by way of offering a four-pronged approach to cyber security: (1) reinforcement of current products, (2) development of specialized security products, (3) formation of security consulting teams, and (4) formation of cyber first-responders.

Besides the outsourcing services typically provided, products are commonly offered to companies that wish to perform activities in-house. Examples of such products are DST's TRAC for managing business retirement plans, TA2000 for individual account management and recordkeeping, and AWD for efficiently organizing communications as well as systems, together with the individuals that utilize them (DST, 2014). Investment managers and banks will need to be reassured these existing products are safe and their information is secure. The fund company is the one that will suffer the greatest loss of business and revenue because of a breach.

As new products and services are developed, financial solutions companies will need to place a greater emphasis on the security of their offerings. Totally new products should be developed specifically with the intention of being marketed to financial companies as cyber security products. The unique capabilities of companies such as DST allow them to adapt technologically in ways the firms they serve cannot, while doing so in a more formal and impactful way than Fintech start-ups. This ideal positioning will allow established and trusted brands to enter into this new field of required products and services. DST operational products should be backed up by DST security products.

Selling products to companies is not going to wholly stop sophisticated hackers. Cyber warfare is constantly evolving and dynamic, and its landscape shifts with every technological breakthrough. According to the New York State Department of Financial Services report (2014), emerging technologies and increasing sophistication of threats are by far the top reasons that firms are facing difficulties in implementing cyber security measures. These finance companies have never had to be this dynamic, and it shows. They need more than to be sold a product; they need to be taken step by step through the overwhelming intricacies of cyber security (Booz Allen Hamilton, 2014). Services companies that have established themselves as trusted technology players within the industry are strategically positioned to offer advice and consulting to these firms. Cyber security specialists should work with finance companies to set up sound internal networks and advanced detection mechanisms, while teaching internal oversight of the warning signals they should be looking for.

No amount of preparation or security will completely isolate companies from having their systems and information compromised. An area of great opportunity for data solutions firms will be in the creation of fail safes and teams that respond to successful hacks. There needs to be a plan for the worst-case scenario, and this task is simply too big for most companies to handle; they just

pretend it cannot happen. Sitting by idly in the current state of affairs is tantamount to inviting a hack, and companies must take action (Booz Allen Hamilton, 2014). Again, nobody is positioned better to offer such capabilities than the very companies that currently provide the entire internal infrastructure for transaction processing and data collection. Fail safes should be developed and offered to companies as a way for them to mitigate the negative impacts of hacks, and a swift response is essential for this. Services involving reaction to network compromises will be invaluable to companies as they seek a way to improve their processes for detection, isolation, and mitigation.

Any company seeking to provide cyber security solutions will be undertaking a great and difficult task. It can be likened to preparing for war, for the opponents are militaristic and the implications of defeat are enormous. The financial backbone of our country is under threat, and the companies that come to the rescue will be tremendously respected and admired. Furthermore, they stand to achieve great financial gain. If done properly, the risk of such a business venture failing is slim. Firms will become aware sooner or later of the need to increase their digital security, and if they do not, the government will assuredly implement laws and requirements intended to protect shareholder and customer information. Governments at all levels have made it a priority to evaluate and assess the escalating cyber threats the U.S. is facing, not only for the sake of the companies in their jurisdiction, but for their own sake as well (Camhi, 2014).

The potential market for cyber security solutions is increasing daily. Eventually, every business, organization, and government agency that can afford it will be seeking outside assistance in the face of cyber threats (Millman, 2014). Financial services companies have a unique place amidst all of this because of their integral role in society, the fact that they hold funds, and their possession of sensitive information on millions of citizens. For the immediate future, the focus will be on securing the networks and IT structures of the financial companies, but the business opportunities will expand far beyond.

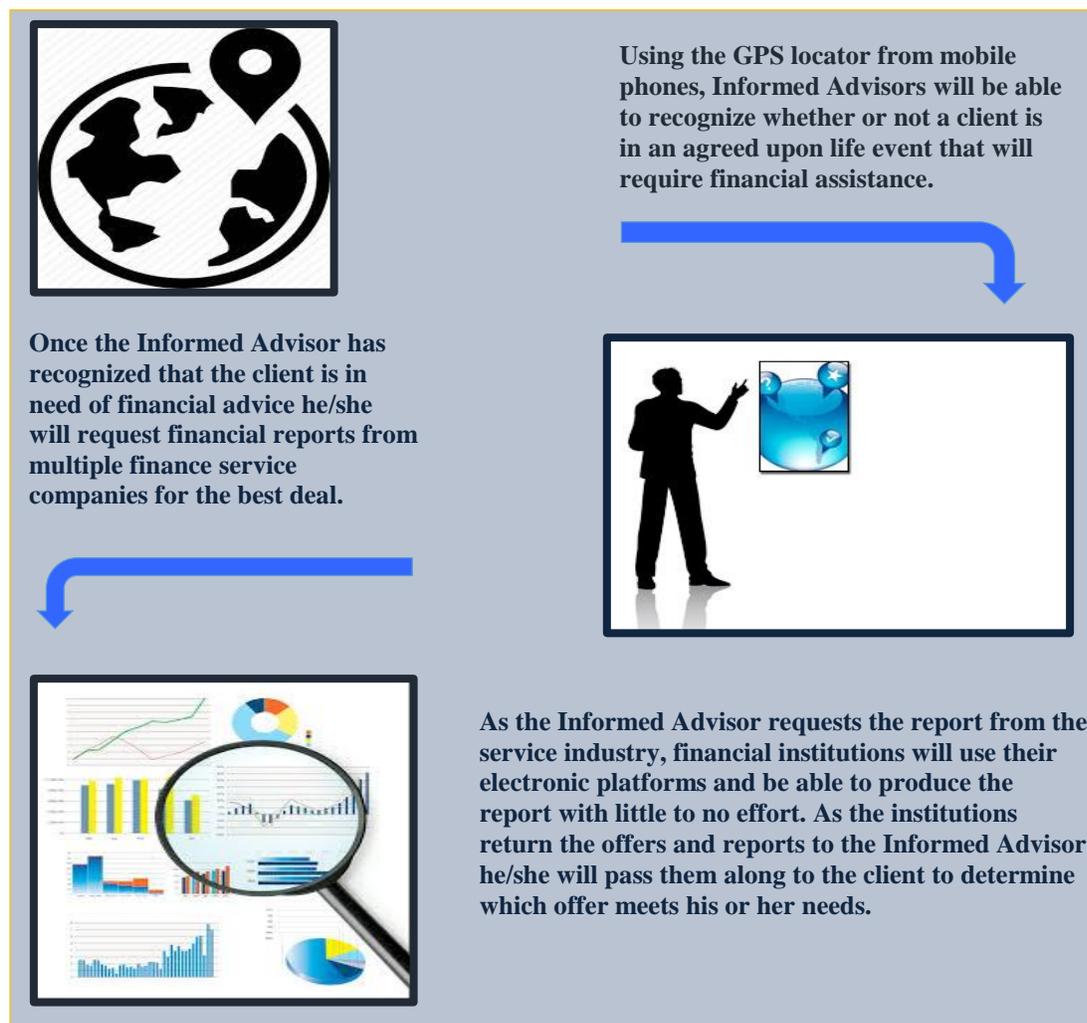
V. The Financial Service Industry in 2020

So far we have discussed the development of financial advisors' roles from a financial professional perspective, and concluded that future roles will always be evolving. As we advance to the year 2020, we believe we will see an integrated model pertaining to financial services. We expect we will transition the role of a financial advisor to what we will call an Informed Advisor. The Informed Advisor will have access to personal information and will be able to provide clients with data reports and advice without their even asking for it. The financial service industry will be alerted by the Informed electronic platform, and will be able to provide a detailed financial report, breaking down the information provided by personal data as well as big data.

The Informed Advisor, having already advanced her/his role as life-coach counselor, will be able to meet with the client on a regular basis highlighting key life events that may need financial attention in the future. As these life events take place in real time, we project that Informed Advisors will not need to be asked by the client for information. When the client and Informed Advisor agree on life events that will need financial attention, the Informed Advisor will be able to put this information into a database. This database will have the capabilities of notifying the Informed Advisor every time the client has entered a business, house, or other commitment that may potentially require financial assistance. We saw earlier that the increase of internet and mobile phone penetration within the world is growing exponentially and the technology to be able to locate a phone using Global Positioning Services is already readily available. Further, the electronic

platform will have the ability to locate the client through GPS giving the Informed Advisor the go-ahead on requesting financial information. Questions might include: Can I afford this? Will I be able to attain a loan? Or is this the right time to purchase the item? Figure 2 illustrates the step-by-step process of attaining this information for the client, along with the roles of the financial services industry and the client.

Figure 2: Globe and GPS Locator



Note: Created for the use of this essay; Api, Financial Report, Poster of Globe and GPS Navigation Element.

The time required to attain loans for life events will be cut in half, increasing productivity in the financial services industry. An Informed Advisor will act as a personal assistant to the client assuring that no matter what comes up, there will be a solution to the problem. As this new technology takes over the financial services industry, regulations will be put in place to assure market equality among competitors. There will also need to be regulations formulated regarding the use of GPS among clients and using it to locate them. This new financial service industry procedure will make attaining loans more efficient for customers and even make it faster to gather financial information on companies. The efficiency that the finance sector gains will allow institutions to maximize their technology and continue to advance with the rest of the technological

world. This will free up advisors to give personal time to investors so they can discuss non-financial concerns as well. This will ultimately build rapport and likely strengthen the long-term relationship.

VI. Privacy Concerns

Data breaches have appeared to be ubiquitous of late – from credit card companies to the financial debacle at Target, Inc. Financial services firms can be particularly vulnerable, especially when millennials want instant access, and want it on their time frame. Solutions are varied, but one controversial but popular future move is to implement some type of facial recognition technology. Companies are currently using this information for predominately-marketing purposes, but government uses the technology to help combat terrorism.

The report, *Facial Recognition Technology: Commercial Uses, Privacy Issues, and Applicable Federal Law*, was given to the Subcommittee on Privacy, Technology and the Law General Accountability Office (GAO) in July 2015. There are various laws now on the books, but many of these laws appear to be outdated. Many privacy advocates want more protection, but as recent breaches have proven, laws do not usually stop criminals from action. The Gramm-Leach-Bliley Act (GLBA-1999) was designed to restrict the disclosure of public information. The Fair Credit Reporting Act (1970) supposedly protects the security and confidentiality of personal information. Companies, as well as consumers, want more surveillance of criminals. Will the future allow technology to block criminals, or will privacy concerns rule the day?

The GAO report issued in the summer of 2015 considers facial recognition technology (FRT) to block unwarranted users from accessing financial services products. Although millennials may want to divulge personal information on Facebook, they have no desire to have their financial information or their money stolen. Most financial experts believe that in the future – and not that far away – it will be feasible to readily and accurately identify by name practically any individual in the world by implanting FRT. The National Telecommunications and Information Administration (NTIA), a Department of Commerce agency, is currently addressing privacy issues associated with this technology. The NTIA is including convening stakeholders to try to develop a voluntary and enforceable code of conduct for industry participants. The GAO report issued in the summer of 2015 reviews privacy issues involving FRT. This report analyzed four areas of concern: the use of FRT, privacy issues concerning commercial uses of FRT, the proposed best practices and industry privacy policies for FRT, and any privacy protections under federal law that apply to FRT. Privacy concerns are relevant, but the major recent breaches of security, including the Target, Inc. fiasco, could have been averted with the use of FRT (GAO Report, 2015).

FRT is one of many biometric technologies – eye scanning being even more effective – that identify individuals by measuring and analyzing not only physiological characteristics but also behavioral tendencies. These biometric technologies have been created to help identify people analyzing their faces, hands, eye retinas and irises, fingerprints, voice, gait, etc. Conventional identification methods, such as usernames, passwords, or special cards for entry can dupe old security systems, but various biometric technologies measure distinctions that are unique to each individual and cannot be changed easily (GAO Report, 2015).

The GAO Report lists four basic components to an effective facial recognition technology system: a camera, an algorithm to create a face print (called a facial template), databases to store images, and an algorithm to compare the image to the databases of images or a singular image in the main database. This technology is already here, but the public's concern is more with

corporations using the information, as opposed to the government implementing the technology. The Homeland Security Department of the U.S. government already requires fingerprints to procure TSA early boarding numbers for airline transportation use. When people, especially the millennials, desire safety over privacy, then this technology of the future will be implemented across the board. We personally believe that Facial Recognition Technologies, along with other biometric technologies, are here to stay, and concerns should be more about companies sharing private data. Consumers can still opt out of allowing corporations permission to share personal information. Biometric technologies are future resources, which probably will not ultimately be blocked by free but secure governments. The safety concerns in industries such as transportation and financial services are just too great (GAO Report, 2015).

VII. Conclusion

The future will see an increase in efficiency, not only with the use of technology, but also in the roles played by financial professionals. Technology will continue to adapt throughout the coming years, until we see electronic platforms and data integrated to reach maximum efficiency. This will also allow the current financial advisor's role to develop into a life-coach counseling function. Advisors will be able to meet the demand for changing client needs. Once maximum efficiency is reached in the electronic platforms and the life-coach consulting roles, the finance professional will be able to offer a more efficient and effective combination of service excellence and customer satisfaction.

The utilization of this combination will only prove sufficient for the finance industry for a finite period. As data utilization and analytics continue to evolve into a new realm, the financial industry will once again be faced with deficiencies in addressing evolving client needs. At that point, yet another solution will be necessary to continue adapting to changing technology. There is only one certainty within the technology world: it will never stop developing. Looking back at how far technology has come in the past two decades, one can only imagine where the technology world will take the financial industry, and society as a whole, in the upcoming decades.

The most difficult challenge faced in improving the cyber security of the U.S. financial industry might just be the financial industry itself. Wall Street is fond of squeezing every last ounce of usefulness out of something before discarding it and seeking an alternative. All too often, this change is ultimately forced by some type of catastrophe or crisis. In this case, it would indeed be a crisis if disaster were brought on by cyber attacks. The era of cyber warfare is about to give rise to an industry of advanced cyber security, and regardless of whether financial companies realize the seriousness of their situation before or after a calamity, someone will stand to profit greatly from it. As the venerable Sun Tzu said, "The art of war teaches us to rely not on the likelihood of the enemy's not coming, but on our own readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable."

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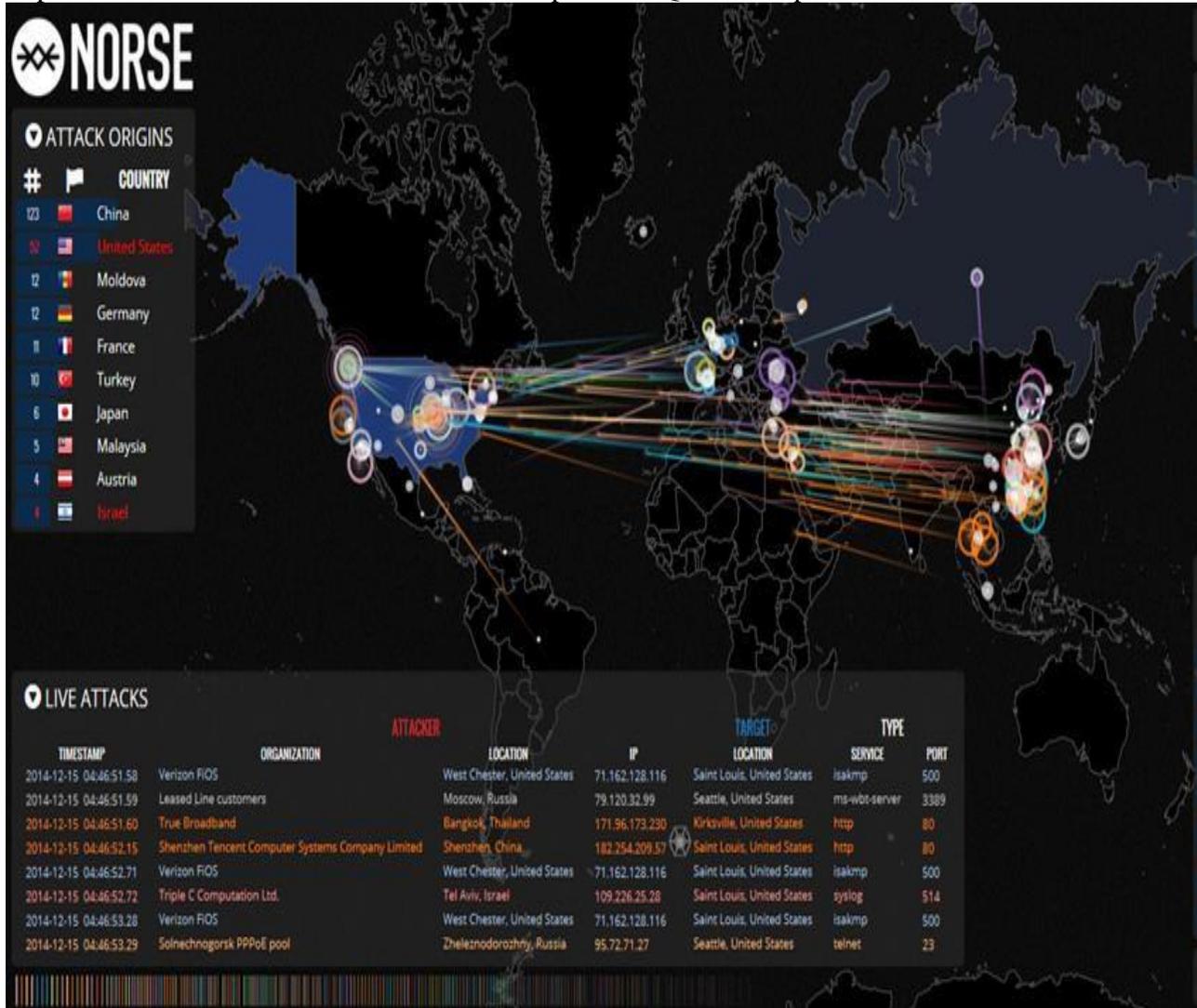
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Appendix A

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Principal-Principal Agency and Financial Flexibility in Transition Economies

By STACEY ESTWICK*

This study examined the impact of principal-principal agency on financial flexibility in transition economies. Such economies are characterized by high ownership concentration. This study analyzed secondary data on publicly listed firms in Jamaica, Trinidad and Tobago, and Barbados during the 2007 to 2013 period, using panel data analysis and Arellano and Bond 2-step Generalized Methods of Moments estimators. Contrary to evidence of past empirical studies in developed jurisdictions, these results suggested that the principal-principal agency relationship might at times enhance the financial flexibility of the firm through higher levels of internal funds, and significantly higher levels of liquidity.

Keywords: Principal-Principal Conflict, Financial Flexibility, Corporate Governance, Leverage

JEL Classification: G01, G30, G32, G39

I. Introduction

Financial flexibility has received notable attention in recent finance literature. Its value has increasingly been investigated since the start of the 2008 Global Financial Crisis (GFC) and the failure of companies worldwide. Past studies of financial flexibility have been conducted in large developed economies where firms exhibit dispersed share ownership (Bancel and Mittoo, 2011; Marchica and Mura, 2010). Recent corporate governance research however suggests that in transitioning economies, where ownership of firms is shifting away from an era of familial ownership, there is concentrated share ownership, which results in principal-principal agency conflict (Young *et al.*, 2008). It has been argued that this agency conflict impacts the behavior of top management and the financial management practices of the firm (Claessens *et al.*, 2000). Academics and practitioners alike have turned their focus to these transitioning economies, hence reinforcing the need to examine the impact of principal-principal conflict on financial flexibility. The examination of this phenomenon will assist in the formation of appropriate corporate governance policies and mechanisms for such economies.

Financial flexibility (FF) refers to the ability of the firm to respond to investment opportunities, especially in the face of economic crises such as the 2008 GFC. This FF has been defined briefly by Modigliani and Miller (1963) as reserves of untapped borrowing power. FF depends not only on the ability of the firm to fund investments at a low cost, but also on the strategic decisions of the firm and the degree of managerial entrenchment.

The aforementioned definition of FF implies that financially flexible firms possess a degree of excess resources. This makes the issue of agency critical, since from the early work of Jensen (1986), it was argued that excess resources could lead to firm inefficiencies and negatively impact firm performance. However, evidence has supported the argument that this

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flexibility is important if firms are to explore positive net present value investments and maximize shareholder wealth. Although it is evident that FF is necessary, there is still the risk that managers will utilize any surplus to their own advantage. Contemporary corporate governance policies have been formulated based on the ownership models that exist in developed economies, in order to limit the managerial indiscretion that can be caused by managerial flexibility.

Due to the shift away from familial ownership, many firms have concentrated rather than dispersed ownership structure. This has brought the principal-principal (PP) conflict identified by La Porta *et al.* (1997) to the forefront of academic attention, and in this paper, we will examine FF under this type of agency conflict. Under PP conflict, majority shareholders use their influence to their own benefit, at the expense of minority shareholders. It is indeed possible that the existence of FF under concentrated share ownership may necessitate differing corporate governance policies to ensure the maximization of shareholder wealth, which is the overriding aim of the financial manager.

Currently in the Commonwealth Caribbean there are five main stock exchanges, namely the OECS Exchange, the Barbados Stock exchange (BSE), the Bahamas International Securities Exchange, the Jamaican Stock Exchange (JSE), and the Trinidad and Tobago Stock Exchange (TTSE) with approximately 126 publicly listed companies in total. Many of these companies have found it challenging to raise financing for operating and investing purposes. A main contributor to this lack of equity trading is the existence of few dominant shareholders, which increases the probability of PP conflict within the region.

This study is organized as follows. Firstly, the context of the study is examined. This gives in-depth details of the setting used for the study. This is followed by a review of the literature surrounding the FF and PP conflict. Based on the existing literature, the next section proposes the framework to be tested in the study. This is followed by the formulation of the hypotheses, the methodology, the results and analysis, and summary of the results. The paper concludes with a statement of limitations and areas for future research.

II. Context of the Study

This study focuses on the impact of PP conflict on the management of FF of publicly listed firms in the English speaking Caribbean. The Caribbean is considered a transition economy whose corporate governance environment is influenced by the common-law legal system. Additionally, the corporate governance environment encourages external influences in the management of the firm. The contribution of this study is highlighted by the characteristics of the markets in this region, and the dominant ownership structure of firms in these territories.

While this study does not focus on corporate governance as a key variable to be considered in pursuing the objectives of this research, PP conflict has traditionally been associated with and examined within corporate governance literature (Young *et al.*, 2004). However, the scope of this study transfers the concept of PP conflict into the realm of corporate finance, and explicitly considers the impact of this phenomenon on the corporate financial practices of the firm. It is therefore necessary to consider corporate governance from a contextual standpoint, in an effort to highlight the origins and importance of PP conflict.

Although the governance model witnessed in the Caribbean region is similar to that of many developed countries such as the United Kingdom, there are elements of the Caribbean corporate landscape that necessitate unique corporate governance mechanisms. However, the corporate governance framework has been slow to address the peculiarities of governance in the region.

Caribbean firms are still in the familial era, since high family ownership exists in many public companies. In addition, publicly listed firms exhibit ownership concentration in excess

of 59 percent. This characteristic is one impediment to stock market growth in the Caribbean region, and is a major concern to regulators in the Caribbean. According to Claessens and Yurtoglou (2013), transition economies and Latin American countries tend to have low stock market development, which has consequences for corporate governance.

The high ownership concentration has been partly responsible for some corporate governance initiatives that have been implemented. These initiatives were driven by the concern for minority shareholder protection. Across the region, there has been an amendment to company laws which requires public companies to have at minimum three directors, two of whom must not be officers or employees of the company or its affiliates. There have also been efforts to establish a Caribbean Code of Governance that protects the rights of minority shareholders and requires more accountability by the board of directors, but this has not been well supported by the various Caribbean governments. Refinements to the Company Law Acts in Trinidad and Barbados outline the role of directors, in an effort to increase board effectiveness and control agency problems. For example, the Company Law Act of Barbados specifically states that a director should discharge his duties in the best interests of the employees and shareholders of the company. Though the laws of Caribbean governance provide for protection of minority shareholder rights, in practice, these rights may be seldom enjoyed, with minority shareholders taking a passive role in the decision-making. For example, appointment to the board of directors is usually driven by the preference of the blockholders. According to La Porta *et al.* (2006), Jamaica scored 35 on a scale of 0-100 on the protection of minority shareholder rights index, which was below the average for similar economies. This statistic justifies the concern for minority shareholder protection in the region.

Weak corporate governance environments tend to favor majority shareholders, and have implications for the financial management of the firm. Claessens and Laeven (2003) found that in weaker legal environments, firms obtained less financing and engaged in sub-optimal investing. Djankov *et al.* (2008) showed that better creditor rights and shareholder rights were associated with more developed capital markets, since lenders were more willing to extend financing. There is also evidence of cost of capital implications. Chen *et al.* (2011) found that U.S. firms with better corporate governance had a lower cost of equity. Effects were stronger for firms with greater agency problems. Skaife *et al.* (2004) reported that firms with more institutional ownership had lower costs of capital.

This study is set in an ideal context to investigate how Caribbean FF is managed and affected in the presence of blockholder managerial influence.

III. Literature Review

A. Review of Contemporary Theory: Financial Flexibility

In 2001, Graham and Harvey conducted a large study on the practice of corporate finance. This study was motivated by the finding that finance managers are less likely to follow the mainstream early capital structure and capital budgeting best practices. This study asked CFOs to identify factors that affect the company's decision to issue debt. Flexibility ranked highest among the responses, while earnings and cash flow volatility, and lack of internal funds ranked third and fourth respectively. This study led to the re-emergence of the term 'financial flexibility,' and FF was then considered to be the missing link in understanding the practice of corporate finance.

As a result of the findings of Graham and Harvey (2001), contemporary researchers have continued to study FF and its link to capital structure policy, capital budgeting, and payout policy. For example, a study conducted by Byoun (2008) attempted to explain why some firms opt for debt financing if FF is the driver of capital structure choice. His findings were consistent

with the early FF hypothesis, which suggested that the demand for FF is the main driver of the firm's capital structure decisions.

These studies conducted by Graham and Harvey (2001) and Byoun (2008) used sampling populations from the US and Canada, but unfortunately, no similar studies on corporate decision-making have been conducted to date in transition economies such as the Caribbean where financing choice is limited, and ownership structures have the potential to affect corporate finance practice.

B. The Determinants of Financial Flexibility

The determinants of FF are a work in progress for researchers in the field. It has however been acknowledged that FF may be achieved through more than spare debt capacity, and survey approaches are again being taken by researchers in order to define these determinants. Interestingly, even the early work of Graham and Harvey (2001) highlighted the need for considering liquidity as another determinant of FF when managers identified payback as a critical decision making criteria. Several ensuing studies (DeAngelo and DeAngelo, 2007; Marchica and Mura, 2010) followed the assumptions of Graham and Harvey (2001) and examined the value of unused debt capacity in maintaining FF, but they failed to give explanations for the reluctance of many companies to reduce debt levels. Many studies highlighted the role of transitory debt in maintaining FF (DeAngelo *et al.*, 2011; Denis and McKeon, 2012; Sufi, 2009). While not disputing the definition proposed by Graham and Harvey (2001), it is evident that FF is a dependent variable with many of its determinants yet to be identified and fully tested.

In a more recent study, Bancel and Mittoo (2011) directly focused on assessing the measures that determine FF. Their main finding was that managers use several sources to enhance FF. Managers identified various operational measures, leverage, and working capital ratios in their determinants, and 69 percent of respondents reported increased liquidity concerns during times of economic uncertainty. Firm managers identified using internal funding and maintaining large cash holdings as major methods of liquidity management during the crisis. Although Bancel and Mittoo (2011) proposed, based on the results of correlation tests, that a more all-encompassing measure, such as the Altman Z score¹ may be better in measuring FF, they suggested that more research be conducted to develop a measure that considers leverage, liquidity, and operating ratios.

Past research conducted by Almeida *et al.* (2011) and Campello *et al.* (2010) highlighted the value of liquidity and spare debt capacity in maintaining the FF of the firm during the GFC. Campello *et al.* (2010) examined the effects of the financial crisis on financially constrained companies in the US, Europe, and Asia. They acknowledged that such firms experienced a severe impact from the crisis, using cash and existing lines of credit for fear that banks would eventually desist lending to these corporate entities. They also discovered that firms needed liquidity to embark on profitable projects, due to their inability to borrow. Their study was consistent with the view that during recessionary conditions firms build cash reserves to insulate themselves against credit supply shocks. Almeida *et al.* (2011) demonstrated the importance of spare debt capacity, and pointed out that during the GFC, firms with a larger portion of short-term debt were forced to scale down their investments more than those companies with smaller portions of short-term debt. The findings of the aforementioned study showed strong agreement with Bancel and Mittoo (2011).

¹ Altman Z score, developed by Edward I. Altman, is a score used to predict a company's risk of bankruptcy.

C. Ownership and Agency

A review of the literature has shown that the majority of studies advanced to date on financial flexibility have been conducted in the US, Europe, and other developed markets. In addition to these capital markets being significantly less constrained than those in transitioning markets, the ownership structure of these firms also differs. In developed markets, ownership may be dispersed, while firms in transitioning markets have concentrated ownership. Research also dictates that such concentrated ownership impacts the management of the firm (Claessens *et al.*, 2000).

A review of the studies conducted on FF showed that traditional owner-manager agency conflict is a key variable considered in its testing (Opler *et al.*, 1999). Academic research has shown that agency has an impact on the strategic financial planning and operations of the firm. Some studies have included traditional agency as control variables in their models (Marchica and Mura, 2010), while some researchers have explicitly considered the link between owner-manager agency and FF (Oded, 2008). Many studies also examined the relationship between agency and the variables critical in determining FF, namely, liquidity and leverage (Kalcheva and Lins, 2007).

As was previously mentioned, although traditional corporate governance research was founded on the premise that share ownership was widely dispersed, subsequent studies found that many companies had blockholder interests (Denis and McConnell, 2003). Mehran (1995) reported that 56 percent of the firms in a sample of randomly selected manufacturing firms from 1979 to 1980 had outside blockholder interest. Studies of ownership structure in the UK followed a similar pattern to that of the US, with many dispersed shareholders. Beginning in the 1990s, governance research examined ownership structures in other parts of the world. It was found that concentrated ownership was very common in these parts of the world. Blass *et al.* (1998) found high ownership concentration in Israel. Xu and Wang (1997) also documented high ownership concentration in China.

A study conducted by La Porta *et al.* (1997) found that in countries with common-law systems, dominant shareholders owned an average of 45 percent of the shares of the company. La Porta *et al.* (1997) found that many publicly-traded firms in underdeveloped markets were characterized by the common-law system and the corporate governance environment reflected this heritage. La Porta *et al.* (1997) further stated that dispersed ownership in large public companies is an academic fairytale. Concentrated ownership has in fact been recommended as a corporate governance mechanism to counter the effect of agency conflict in developed countries (Demsetz and Lehn, 1985). However, in transitioning economies, concentrated ownership is an underlying cause of PP conflict, and serves to only confound the agency problem (Faccio *et al.*, 2010). Young *et al.* (2008, p. 201) continued to state that "...[d]ominant ownership is common among publicly-traded corporations in emerging economies and is a root cause of PP conflicts."

D. The Consequences of PP Conflict

PP conflict has been proven to have an impact on many aspects of financial policy, mainly through its effect on the dynamics of the board of directors. Such consequences of PP conflict have been found to be both negative and positive for the firm. The work of Dahya *et al.* (2008) examined the impact of concentrated ownership on board structure. They found in a cross-country analysis of board structure and corporate value that a dominant shareholder could offset the loss in value to the firm caused by poor shareholder protection by appointing an independent board. They argued that this should enhance value-added decision making by the managers and increase the FF of the firm. This is in line with the arguments of Jensen and

Meckling (1979) that high concentration of ownership is expected to lead to greater monitoring of the company's management. Shleifer and Vishny (1986) extended this by concluding that increased monitoring should also result in increased value of the firm. Maury and Pajuste (2005) found that where ownership was concentrated in the hands of multiple large shareholders, there was a positive effect on firm value due to greater levels of monitoring. Lins (2003) found large non-management block holdings were positively related to firm value, especially in countries with low shareholder protection. They attributed this to the ability of such large shareholders to restrict managerial agency costs and substitute for any missing governance mechanisms.

However, there are reasons why PP conflict may result in decreased firm value. It has been argued that concentrated ownership could lead to poor investor protection, which then decreases the ability of the company to raise new equity capital from minority shareholders at low cost (La Porta *et al.*, 1997; Lins, 2003). In addition, La Porta *et al.* (1997) showed that countries with high ownership concentrations that led to poor investor protection had significantly smaller capital markets, which resulted in increased costs of financing.

Several studies examined the impact of PP conflict on various aspects of finance decision making. Ozkan and Ozkan (2004) argued that dominant shareholders have no effect on the degree of managerial entrenchment, while the findings of Lewellyn and Muller-Kahle (2012) suggested that where there are dominant family shareholders, managerial decision making is affected.

Given the importance of maintaining surplus liquidity and debt capacity under constrained financial conditions, it is expected that expropriation would become more severe during times of crisis for firms with concentrated share ownership (Leuz *et al.*, 2009). Liu *et al.* (2012) examined this issue during the GFC and found that ownership concentration mitigates financial constraints and engenders expropriation problems.

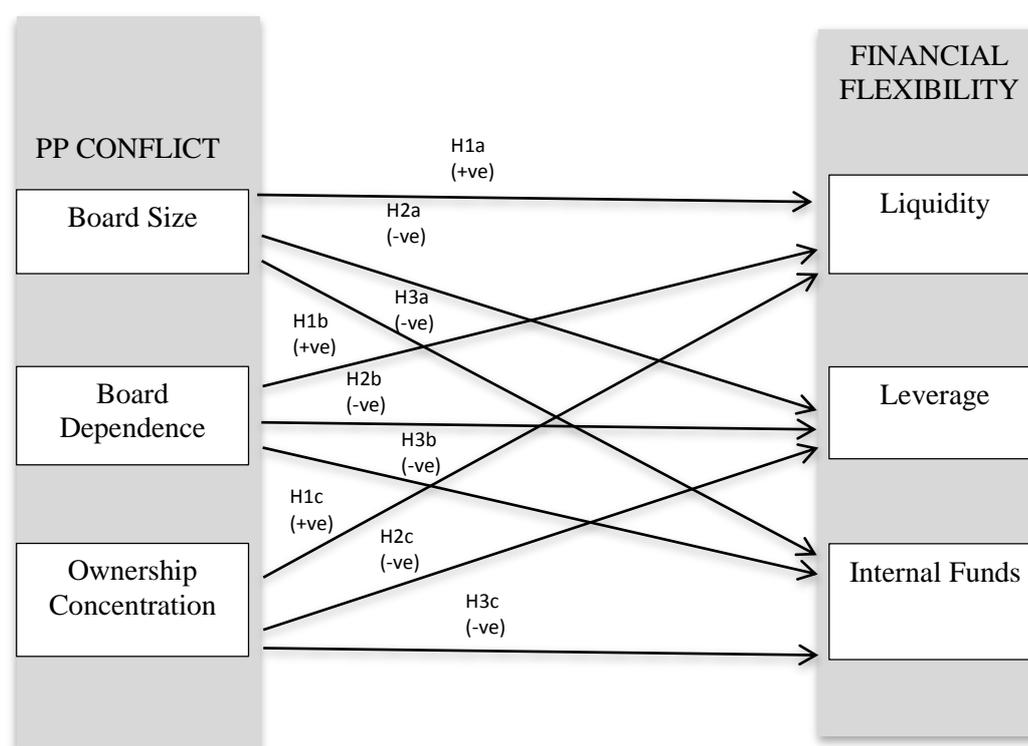
A review of these studies on corporate governance details some of the issues that arise with the existence of PP conflict. It is clear from the review of the extant literature on FF and PP conflict that high ownership concentration is a potential threat to the attainment of FF, and the overall performance of the firm. Its actual effect hinges however on the ability of the corporate governance environment to control the risks of asset expropriation. This leads one to concur with Young *et al.* (2008) that PP conflict alters the corporate governance process, the financial management of the firm, and the pursuit of shareholder wealth maximization, and provides the rationale for the chosen topic of study.

IV. Purpose of the Study and Proposed Framework

This study seeks to test the relationships between PP conflict and FF in transition economies. Specifically, the study closely examines the impact of PP conflict on the achievement of FF in the Caribbean.

The following is a diagrammatic representation of the framework to be tested in this study. The relationships demonstrated in the framework are based on a review of the literature related to PP conflict and FF.

In Figure 1, the liquidity levels of the firm, spare leverage capacity, and internal funds represent FF. This depiction of FF is in line with past studies that have shown liquidity, internal funds, and debt capacity to be indicators of FF. The framework also introduces components of PP conflict (board size, board dependence, and ownership concentration) as having relationships with the FF of the firm. It is expected that PP conflict will have an impact on the ability of the firm to respond to opportunities in the operating environment as they become available (FF).

Figure 1: Conceptual Framework of PP Conflict and Financial Flexibility

A. Theoretical Underpinnings of the Framework

This section identifies and discusses the underlying theoretical foundations of the relationships embedded in the proposed framework. This new framework is based on some established theories in corporate financial management, which have been used to extract proven relationships that drive the conceptualization of this framework.

A.1. Liquidity Theories: Keynes (1973) Liquidity Preference and Baumol (1952) Inventory Management Theories

The conceptual framework outlined above focuses on FF, which is the most current thrust of capital structure research. Contemporary studies in FF have identified liquidity, internal funds, and spare leverage capacity as key contributors to the FF of the firm. Leverage is closely linked to liquidity of the firm since debt capacity gives the firm access to additional liquidity and cash, should the need arise. The importance of liquidity in the achievement of FF leads to the Keynes (1973) liquidity preference and the Baumol (1952) inventory management theories as key theoretical underpinnings of this framework.

Keynes (1973) stated that there are two benefits to holding cash, namely the transaction cost motive and the precautionary motive. The transaction cost motive states that the firm can save the transaction costs of raising funds by holding cash. The precautionary motive states that the firm can use cash to fund its activities and investments if other sources of capital are not available. Keynes' focus on liquidity builds on the models of insufficient liquidity, which were also examined by Myers and Majluf (1984). Keynes (1973) concludes that for a given amount of net debt there is an optimal amount of cash, hence cash is not simply net debt.

Other early cash management research includes the work of Baumol (1952) and Miller and Orr (1966). Baumol (1952) developed a static quantitative model of inventory management that weighed the benefits and costs of holding cash. This work looked at cash as an asset that needs to be managed like another physical commodity. This model underlies the assumption that cash is valuable due to the high costs incurred in converting non-cash assets to cash.

These theories support the use of spare debt capacity and liquidity as critical drivers of the firm's FF, instead of simply using a net-debt measure. Recent empirical studies (Bancel and Mittoo, 2011; Marchica and Mura, 2010) have also been conducted which support these two variables as indicators of FF. Indeed, the Graham and Harvey (2001) study which identified FF as a practical determinant of capital structure policy also found support for spare debt capacity and leverage as drivers of FF. The importance of liquidity is expected to be more heavily emphasized in the Caribbean given the value of liquidity under constrained market conditions. This premise is consistent with Myers and Majluf (1984) and Bancel and Mittoo (2011), who stated that liquidity was critical in managing negative economic shocks.

A.2. Jensen and Meckling (1979) Agency Theory

A common variable considered in a vast majority of empirical finance studies is agency conflict. Agency conflict arises when one stakeholder of the firm acts in direct opposition to the interest of other stakeholders. The prominent agency theory of financial management is the Jensen and Meckling (1979) theory, which states that firm management at times acts contrary to the interests of the shareholders, and that this can lead to conflict. The proposed framework of this study however considers owner-owner conflict, where the majority owners pursue personal interests to the detriment of minority shareholders.

While the agency conflict variable in this study differs from that of the Jensen and Meckling (1979) theory, literature argues that the effect of PP agency conflict is similar. Management and finance theory dictates that owner-manager conflict leads to non-value maximizing strategies, which are not in the interests of shareholders. Similarly, the owner-owner conflict, which is examined in this study, has been found to lead to expropriation of assets and managerial decisions that are not in the best interests of shareholders. These effects of PP conflict were first highlighted by La Porta *et al.* (1997).

V. Formulation of Hypotheses

A. PP Conflict and Liquidity

While there have been no studies advanced to date which specifically considered the link between PP conflict and the composite construct of FF, there has been research which examined the link between ownership and the two main indicators of FF, namely liquidity and spare leverage capacity. Based on the evidence presented in such research, this paper posits a direct relationship between PP conflict and the indicators of FF.

The presence of PP conflict raises concerns for expropriation of assets, which depends on the perceived effectiveness of the board in controlling the actions of management. Maury

and Pajuste (2005) noted that high cash levels lead to shareholder concern for expropriation. As was noted in the literature review, Hu *et al.* (2010) found that in China, the existence of concentrated shareholders led to inefficient corporate governance, and Dittmar *et al.* (2003) noted that where corporate governance is low, cash is retained. This leads one to question the handling of liquidity under such conditions. Ozkan and Ozkan (2004) however found that cash levels do not change with the existence of ultimate shareholders.

Based on the aforementioned arguments, the existence of PP conflict may result in higher cash levels. This may arise in two possible situations: high levels of cash may be maintained with a view to funneling assets for the private benefit of majority shareholders, or the retention of cash may result from an effort to maintain high levels of FF. The first possibility may arise if boards are ineffective, and this will eventually be detrimental to the achievement of FF through lower levels of overall internal funds. In the second possibility, cash will be retained if, similar to the findings of Bancel and Mittoo (2011), firms accumulate liquidity as a buffer in recessionary conditions. The first hypothesis therefore is:

H1: PP conflict will have a positive impact on the liquidity level of the firm.

B. PP Conflict and Debt Capacity

One may argue that there has been little research that specifically examines the impact of PP conflict on debt capacity, which is another main determinant of FF. Most research that examines PP conflict and leverage levels focuses on the impact of differing ownership structures on leverage levels, but not the degree of PP conflict. Chaganti and Damanpour (1991), Huang and Song (2006) and Zou and Xiao (2006) directly examined the effect of institutional ownership on leverage levels, with mixed results. Some researchers also conceptualize that high ownership concentrations will shift the monitoring of the firm to the majority owners. It is argued that this shift should result in lower tolerance for risk, and that leverage can then be used as a governance mechanism by management to counter the opportunity cost of high ownership concentration and increase the owner's appetite for risk (Heinrich, 2000). This argument is however built on the Jensen and Meckling (1979) owner-manager agency conflict as opposed to the PP conflict of concentrated ownership. Berglöf (1991) also viewed ownership concentration as leading to increased leverage, due to an increased risk tolerance by owners.

Some research has specifically examined the effect of owner-manager agency conflict on leverage. Leland (1998) examined agency conflict and debt capacity and found that high agency conflict led to higher debt costs and lower levels of leverage. The framework proposed in this study argues that PP conflict will lead to higher equity costs and greater dependence on debt. It has been argued that concentrated ownership could lead to poor investor protection, which then decreases the ability of the company to raise new equity capital from minority shareholders at a low cost (La Porta *et al.*, 1997; Lins, 2003). Raising equity should be more expensive due to minority shareholders' fears of expropriation of assets (Maury and Pajuste, 2005). Hence there will be a greater dependence on bank credit, consequently decreasing the leverage capacity of the firm. While this argument coincides with the relationship suggested by Berglöf (1991) and Heinrich (2000), it is based on a different underlying argument. The hypothesis proposed is therefore:

H2: PP conflict will have a negative impact on the unused debt capacity of the firm.

C. PP Conflict and Internal Funds

Based on the findings of Bancel and Mittoo (2011), and consistent with the propositions of the pecking order theory of finance, managers should place value on internal funds in maintaining FF. However, since it has been argued by Maury and Pajuste (2005) that PP conflict leads to expropriation of assets, this is expected to lead to lower levels of internal funds. Consistent with this, the next hypothesis is:

H3: PP conflict will have a negative impact on the level of internal funds.

VI. Methodology

According to Creswell (2009), quantitative research aims at testing objective theories through the statistical analysis of numerical data. Bryman and Bell (2011) argued that quantitative research uses a deductive approach to relate theory to research. Quantitative testing is therefore usually aimed at confirming or rejecting a number of hypotheses, which have been formulated based on a review of the extant literature (Robson, 2002).

In this study, the proposed hypotheses were aimed at extending the prior theory on FF in a new direction. A deductive approach was used, where numerical data were collected to allow the researcher to make generalizations about the operationalization of FF under PP agency in the Caribbean. The hypotheses to be tested were based on a review of the extant literature surrounding these two variables. Liquidity, unused debt capacity, and internal funds were the dependent variables, while PP conflict was seen as an independent variable. The hypotheses developed were tested using Eviews statistical software with regression analysis.

A. Secondary Data Analysis

This study used dynamic panel regressions, which were run on secondary data. The data included in the sample were obtained from the publicly available annual reports for the companies. These reports included financial statements and corporate governance disclosures, which were needed to calculate the ratios used in variable measurement. Unfortunately, there is no database available with financial information for listed companies in the Caribbean, and as such, a database was created from which the necessary variables were extracted. As is the norm with developed jurisdictions, International Accounting Standards require that an independent auditor verify all information included in a company's annual report, and assess this information for bias and subjectivity. Hence, data obtained from these reports were considered reliable and credible. In addition to exhibiting high reliability, the use of these secondary data avoided the time and cost necessary if using surveys to obtain the data.

B. Sample Description

In order to investigate the effect of PP conflict on FF in transition economies, it was decided to utilize the listed companies of the three most developed stock exchanges in the Caribbean to extract the necessary data, namely the JSE, the BSE, and the TTSE. This region's capital markets are also characterized by a reliance on bank funding and illiquid stock markets. Conceptually, firms in such constrained markets should place high value on FF. The listed companies in the Caribbean were therefore considered ideal for the testing of FF under the PP conflict of high owner concentration. These three stock exchanges were chosen for their comparative level of development, which has resulted in easier access to the financial information of these firms.

The sample used included 74 non-financial companies across the three largest Caribbean stock exchanges, for the period 2007 to 2013. This number included those firms listed on the junior market, as well as the main markets, in these three territories. Financial companies were excluded from the sample since their capital structure and financial-decision making do not follow normal financial management best practices. This sample gave pooled cross-sectional data for these companies across seven firm years, which was considered adequate observation for the statistical data analysis techniques employed.

C. Variables and Justification

C.1. PP Conflict

Many measures have been used in contemporary research to measure the degree of PP conflict. These measures include board size (Su *et al.*, 2008), level of board compensation (Su *et al.*, 2008), cash dividends (Banchit and Locke, 2011), cashflow rights of the main shareholder (Renders and Gaeremynck, 2012), excess control rights of the majority shareholder (Jiang and Peng, 2011) and expropriation of minority shareholders (Jiang and Peng, 2011). Young *et al.* (2008) have also shown the link between PP conflict and board dependence. A close examination of these measures however reveals that they are not all suited to the Caribbean dataset.

The use of board size as a measure of PP conflict is based on the argument that there is a positive relationship between ownership concentration and the size of the company's board (Su *et al.*, 2008). Larger boards are then seen as having the ability to exert greater influence over the financial management of the firm. This measure was used for many studies conducted in the Asian economies where there has been underlying exploratory research on board size and its effect on firm performance.

The use of cash dividends to total assets, cash flow rights, and excess control rights to reflect PP conflict are founded in the argument that majority shareholders use their influence to extract excess cash flow to which minority shareholders do not have access. This is made possible where the varying classes of shares have different voting and dividend rights. Across the Caribbean, the one-share/one-vote system is employed, which does not allow blockholders to declare special cash dividends to particular share classes. This measure cannot then be used in a Caribbean context.

PP conflict is by definition expropriation of minority shareholders, and some studies have sought to reflect this in their measurement of PP. This has been captured through a measure of stock return since minority shareholder value is reflected in the stock's performance on the market, with lower stock returns representing increased levels of expropriation. While this may be true for many developed active stock markets, in the Caribbean stock markets are illiquid, and this has resulted in weak-form market efficiency. Stock prices therefore remain stagnant and are not good indicators of shareholder perceptions and company performance.

The degree of ownership concentration has been found to be popular in much contemporary research on ownership structure and PP conflict in Asian economies (Hu *et al.*, 2010). This measure is debatably the best measure of the degree of PP conflict since it recognizes the influence of the effect of the aggregation of several smaller blockholders as opposed to a single concentrated owner. Indeed, research conducted by Maury and Pajuste (2005) found that the existence of multiple blockholders is more common.

Since each measure may capture some unique aspect of PP conflict, it was decided that board size, board dependence (the percentage of non-independent members on the board), and ownership concentration would be used as triple indicators of PP conflict.

In line with studies that have utilized the ownership concentration measurement, the blockholder was defined as a party with a substantial interest in the shares of the company. The threshold used for substantial interest was 5 percent, since this is the definition advanced by International Accounting Standards for corporate disclosures. Consistent with the study of Hu *et al.* (2010), PP conflict was calculated as the ratio of shares owned by substantial owners to the number of shares outstanding.

C.2. Financial Flexibility

Nascent research has not yet concluded on the indicators of FF, but most recent research in FF recognizes that surplus liquidity, internal funds, and spare leverage capacity are major contributors to the FF of the firm (Bancel and Mittoo, 2011; Denis and Sibilkov, 2010; Gamba and Triantis, 2008; Marchica and Mura, 2010; Whited and Wu, 2006; Sufi, 2009).

Although research has recognized the importance of these three variables, many studies chose to focus on one indicator as opposed to a combination of the two measures. For example, DeAngelo and DeAngelo (2007) used net debt as the sole determinant of FF and argued that cash and debt are two sides of the same coin. Marchica and Mura (2010) used spare debt capacity to measure FF. However, Acharya *et al.* (2007) modeled cash and debt separately within the same framework and highlighted the fact that cash and debt are not the same, especially when there is uncertainty about future cashflows.

Based on the criticisms of earlier research in FF where leverage was used as the sole determinant of financial flexibility, this study opted to use the three determinants of FF as suggested by Bancel and Mittoo (2011), namely internal funds, cash holdings, and spare leverage capacity.

C.3. Control Variables

This study controlled for several mainstream firm controls, as well as variables specific to the testing of PP conflict. Regression analyses controlled for firm specific factors such as firm size, firm age, financial constraints, and growth opportunities, as well as macroeconomic factors such as state of the economy. These controls are in line with the majority of literature surrounding the determinants of leverage and corporate liquidity (Gao *et al.*, 2013; Opler *et al.*, 1999; Whited and Wu, 2006), and have been included since firm specific effects may account for unobserved heterogeneity. Ozkan and Ozkan (2004) posited that it is critical that such heterogeneity be accounted for in analyzing the liquidity of the firm.

Similar to the work of past researchers such as Marchica and Mura (2010) and Whited and Wu (2006) various levels of the lagged dependent variables were included as exogenous variables in the regression models. The inclusion of these lags reflects the targeting behavior of the firm. Numerous studies confirm the idea that firms have a target level of leverage and cash holdings. Indeed, Graham and Harvey (2001) reported that 35 percent of firms have a strict target debt ratio. Similar results were also found by Bancel and Mittoo (2004). Opler *et al.* (1999) examined the determinants of corporate cash holdings and found evidence to support that firms have a target cash level. Failure to include such lags would result in misspecification error.

Debt capacity and cash holdings are correlated with internal funds. Hence the level of internal funds in the prior year is also expected to be correlated to the current year level of internal funds. However, since internal funds represent an accumulation of funds from inception of the business, deeper lags were used as independent variables in the regressions.

Table 1: Calculation of Key Study Variables

Abbreviation	Variable	Measurement
own_conc	Ownership concentration	Percentage of shares held by substantial interests (shareholders with greater than 5% shareholdings)
brd_dep	Board dependence	Percentage of independent directors on the board
brd_size	Board size	Number of seats on the board
liquidity	Liquidity	Cash scaled by total assets
DC	Debt capacity	Tangibility/Total assets= (((0.715*receivables)+(.547*inventory)+(.535*PPE))/ Total assets
UDC	Unused debt capacity	DC - (Debt scaled by total assets)
intfunds	Internal funds	Retained earnings scaled by total assets
firm_age	Firm age	Number of years of incorporation
fin_cons	Financial constraints	KZ index
growth_opp	Growth opportunities	Market to book ratio
size	Firm size	Log of revenues

C.4. Regression Models and Testing

Based on the methodology employed, Eviews statistical software was used to test the following models which resulted from the hypothesis development:

Model 1:

$$liquidity_{it} = \alpha + \beta_1 ownconc + \beta_2 brdsize + \beta_3 brddep + \beta_4 liquidity_{t-1} + \beta_5 size + \beta_6 finconst + \beta_7 economy + \beta_8 growthopp + \beta_9 firmage$$

Model 2:

$$intfunds_{it} = \alpha + \beta_1 ownconc + \beta_2 brdsize + \beta_3 brddep + \beta_4 intfunds_{t-1} + \beta_5 intfunds_{t-2} + \beta_6 size + \beta_7 finconst + \beta_8 economy + \beta_9 growthopp + \beta_{10} firmage$$

Model 3:

$$UDC_{it} = \alpha + \beta_1 ownconc + \beta_2 brdsize + \beta_3 brddep + \beta_4 UDC_{t-1} + \beta_5 size + \beta_6 finconst + \beta_7 economy + \beta_8 growthopp + \beta_9 firmage$$

Given the dynamic nature of the regression models, these regressions were conducted using Arellano and Bond (1991) 2-step Generalized Methods of Moments (GMM) estimators with White robust standard errors to account for heteroskedasticity. Given the structure of the dataset, with a number of cross sections observed at different points in time, the panel data testing was necessary to control for unobserved variables and individual heterogeneity.

VII. Results

A. Correlations and Descriptive Statistics

Pearson's correlations were conducted between the variables used in the regression analyses. This analysis revealed significant results at the 1 percent and 5 percent levels of significance, amongst both the main variables of the model and the control variables of the study (see Table 2). Results shown were in line with the underlying conceptual framework and finance theory. These correlations give added support for the use of such variables as controls in the regression analyses that followed.

Descriptive statistics showed that the firms across these three exchanges exhibited an average age of 67 years, and a mean ownership concentration of 59 percent. Approximately 39 percent of the board members were dependent, and the average board size was nine individuals.

Table 2: Pearson's Correlations and Descriptive Statistics

	Mean	SD	own_conc	brd_dep	brd_size	liquidity	intfunds	firm_age	fin_cons	growth_op	size	recession	lag_liquidity	lag_intfunds	UDC	lag_udc
own_conc	0.59	0.25	1													
brd_dep	0.39	0.23	.465**	1												
brd_size	8.4	2.89	-.440**	-.134*	1											
liquidity	0.09	0.09	-.143*	-.192**	0.038	1										
intfunds	0.48	0.26	-0.014	-0.058	0.008	.252**	1									
firm_age	67.46	34.56	-.135*	-.192**	.221**	-0.016	0.013	1								
fin_cons	-25.17	207.62	-0.004	.220**	-0.025	-.240**	-0.05	0.069	1							
growth_op	9.56	100.38	.143*	-.173**	-0.075	-0.057	-0.004	-0.055	.145*	1						
size	7.65	0.7	-.186**	-.162*	.394**	-0.001	-.258**	0.096	-0.023	-0.045	1					
recession	0.52	0.5	0.113	0.019	0.059	.151**	0.081	0.045	-0.056	0.081	0.021	1				
lag_liquidity	0.09	0.09	-.152**	-.139*	0.026	.708**	.233**	-0.021	-.184**	-0.047	-0.059	0.098	1			
lag_intfund s	0.48	0.26	0.073	0.058	0.003	.113*	.738**	0.032	-0.073	0.047	-.228**	.163**	.249**	1		
UDC	0.27	0.17	.152**	0.06	-.193**	-.163**	0.038	-0.051	.146*	0.02	-.145**	-.165**	-.124*	0.033	1	
lag_udc	0.27	0.17	.149**	0.032	-.211**	-0.071	0.009	-0.048	.182**	0.072	-.128*	-.135*	-.165**	0.037	.748**	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

B. Model Testing

The multiple regression analyses tested the various paths between the indicators of PP conflict and the determinants of FF (i.e. liquidity, unused debt capacity, and internal funds). Collinearity statistics were examined and no multicollinearity was identified.

In the first regression, liquidity was regressed on three indicators of PP conflict. Of the three indicators of PP conflict, board dependence was found to be a significant positive predictor of liquidity ($\beta = .0546$, $p < .05$). Amongst the control variables, the level of growth opportunities was a significant predictor of the firm liquidity levels as firms with more growth opportunities carried lower levels of liquidity. The strongest predictor of liquidity was the prior year level of liquidity ($\beta = 0.1977$, $p < .05$). No evidence of second order serial correlation was noted.

The second regression regressed internal funds on the three indicators of PP conflict. This regression also yielded significant results, with board size ($\beta=.01144$, $p <.05$) being a significant positive predictor of internal funds. Amongst the control variables, the degree of financial constraints and the level of growth opportunities were significant predictors of the level of internal funds. Constrained firms held higher levels of internal funds, and higher levels of growth opportunities led to lower levels of internal funds. An increase in firm age also led to lower levels of internal funds. The strongest predictor of internal funds was the prior year level of internal funds ($\beta=0.8365$, $p<.05$). No evidence of second order serial correlation was noted.

The final regression regressed unused debt capacity on the three indicators of PP conflict. For this regression, none of the indicators of PP conflict was a significant predictor of internal funds. As expected, previous levels of unused debt capacity were the strongest predictor of the firm's current unused debt capacity ($\beta=.4820$, $p <.05$). Amongst the control variables, an increase in firm age was found to lead to significantly lower levels of unused debt capacity.

Table 3: Results of Model Testing

Panel 1: Liquidity			Panel 2: Internal Funds			Panel 3: Unused Debt Capacity		
Variables	Coefficient	P-value	Variables	Coefficient	P-value	Variables	Coefficient	P-value
LIQUIDITY(-1)	0.1977	0.0000	INTFUNDS(-1)	0.8365	0.0000	UDC(-1)	0.4820	0.0000
OWN_CONC	0.0327	0.1622	INTFUNDS(-2)	-0.0712	0.3080	OWN_CONC	0.1710	0.0907
BRD_SIZE	0.0010	0.6372	OWN_CONC	0.0952	0.3406	BRD_DEP	-0.0318	0.6446
BRD_DEP	0.0546	0.0270	BRD_DEP	-0.0008	0.9873	BRD_SIZE	-0.0048	0.5667
SIZE	0.0158	0.3743	BRD_SIZE	0.0114	0.0037	FIRM_AGE	-0.0080	0.0000
FIN_CONS	0.0000	0.2322	FIN_CONS	0.0003	0.0000	SIZE	0.0301	0.3199
RECESSION	0.0058	0.0624	RECESSION	-0.0023	0.7268	RECESSION	0.0106	0.4095
GROWTH_OP	-0.0103	0.0001	GROWTH_OP	-0.0267	0.0009	FIN_CONS	0.0000	0.9720
FIRM_AGE	-0.0010	0.0608	FIRM_AGE	-0.0077	0.0064	GROWTH_OP	0.0032	0.8677
AR(1)		0.9952	SIZE	-0.0376	0.4797	AR(1)		0.9995
AR(2)		0.9987	AR(1)		0.9830	AR(2)		0.9998
Sargan Test (<i>p</i> -value)		0.4432	AR(2)		0.9774	Sargan Test (<i>p</i> -value)		0.4157
<i>J</i> - statistic		18.510	Sargan Test (<i>p</i> -value)		0.4223	<i>J</i> -statistic		19.650
<i>p</i> -value		0.4226	<i>J</i> - statistic		14.990	<i>p</i> -value		0.4159
			<i>p</i> -value		0.5962			

B1. Additional Testing

The companies included in the sample were categorized according to high and low levels of financial flexibility. This study was conducted using the median level of ownership concentration (0.65) to separate the companies into these two groups. SPSS statistics were then used to perform independent samples *t*-tests which examined differences in the levels of liquidity, unused debt capacity, and internal funds between firms of high and low ownership concentration. These tests revealed that firms with low levels of ownership concentration ($M=.1027$, $SD=.0864$) had significantly higher levels of liquidity than firms with high levels of ownership concentration ($M=.0711$, $SD=.0986$). Firms with low levels of ownership concentration ($M=.2398$, $SD=.1358$) had significantly lower levels of unused debt capacity than firms with high levels of ownership concentration ($M=.2987$, $SD=.1903$). There was no significant difference in the levels of internal funds between these two groups.

VIII. Analysis of Results

Testing revealed that firms in the Caribbean with high levels of ownership concentration are associated with lower levels of liquidity, but higher levels of unused debt capacity. In light of the evidence provided by Maury and Pajuste (2005), and Dittmar *et al.* (2003), this may reflect the governance environments that exist in these two groups of firms. The handling of cash and unused debt capacity will be dependent on the ability of the firm's board to manage the expropriation risks that are associated with high ownership concentration. Dittmar *et al.* (2003) argued that cash levels are lower when there are higher levels of corporate governance. It is therefore possible that in firms with high ownership concentration, there is a concerted effort by management to use cash as a governance mechanism and alleviate minority shareholder fears (Maury and Pajuste, 2005), while at the same time, using higher levels of unused debt capacity to maintain the FF of the firm.

From the results of the model testing, it is evident that in the Caribbean, higher levels of board dependence lead to significantly higher levels of liquidity. On one hand, these findings suggest that firms with dependent boards are ineffective in their management of the company. This is evidence of a weak corporate governance environment if one follows the arguments of Jensen (1986), who asserted that where corporate governance is weak, cash is retained. The majority shareholders who are represented by a dependent board may retain excess liquidity with a view to extract private benefits.

This finding however also reflects a concern by majority shareholders for maintaining the liquidity of the firm. This concern may stem from a genuine belief that liquidity is extremely critical to firms operating in constrained markets. Moore *et al.* (2009) examined the importance of liquidity for Caribbean firms and found that liquidity was an important contributor to their viability. In alignment with the suggestions of Dittmar and Mahrt-Smith (2007), it can also be claimed that higher cash holdings are retained for use in value maximizing opportunities. Bancel and Mittoo (2011) justified such stockpiling of cash under constrained market conditions, and this is a characteristic of Caribbean firms.

Results revealed that there was a 1.1 percent increase in internal funds for every unit change in board size. Unlike liquidity, which may be viewed as either negative or positive for the firm, high levels of internal funds are definitely good for the firm. Any decrease in internal funds therefore is a negative signal of the performance of the firm. In this case, larger boards, which are

characteristic of firms with high levels of ownership concentration (Su *et al.*, 2008), are auguring well for the performance of Caribbean firms. These findings contradict the findings of Mak and Kusnadi (2005) who found evidence of a negative correlation between board size and firm performance in Singapore and Malaysia. Weisbach and Hermalin (2002) reviewed the literature on board size and concluded that in the US board size negatively impacted firm performance. Board size in this study may be resulting in enhanced monitoring, which in turn is auguring well for the firm.

Regarding unused debt capacity, although high ownership concentration was associated with high levels of debt capacity, regression tests revealed that the existence of concentrated ownership did not significantly impact the levels of unused debt capacity. These findings have implications for the perceived corporate governance effectiveness of board structures in the Caribbean. While it is expected that PP conflict will lead to higher debt levels and higher equity costs due to minority shareholder fears of expropriation, these findings in the Caribbean context suggest that the existence of PP conflict has no significant impact on minority shareholder perception of risk and the resulting cost of equity. These findings undermine the arguments of Berglöf (1991) and Heinrich (2000) who viewed ownership concentration as leading to increased leverage.

Holistically, the results of this study show that in the case of the Caribbean, which is a transition economy, PP conflict may be positively impacting FF through higher levels of liquidity and internal funds. This may be a result of improved monitoring of the company resources by the board, since the concentrated owners represented on the board have invested material assets in the company and need to ensure that their investment is protected. It may also occur if minority shareholders view dominant shareholders as beneficial to the management of the firm and resulting firm value.

IX. Implications

The investigation of FF under PP conflict in the Caribbean has revealed some critical implications for the corporate governance of firms in transition economies. While many prior studies have examined PP conflict and its impact on business strategies and management of the enterprise, no studies have yet been advanced that consider the effect of shareholder dominance on the maintenance of FF, which has been attributed to the viability of businesses during these tough economic times. This research is capable of informing not only academia, but also practitioners in these transition economies.

The findings of this study show that the existence of concentrated ownership structures in the Caribbean may have some positive impact on the management of FF there. A concern for proper financial management of the firm may stem from the vested interests that blockholders have in the company's future. Since FF is critical for the survival of the firm, especially during economic hardship, policymakers and practitioners alike should pay attention to these findings, and ensure that corporate governance policies do not overly restrict the ability of dominant shareholders to effectively and efficiently manage the firm's FF. These actions are also necessary given the findings of researchers who have found that corporate governance problems may be distinctive (Huntington, 1996; Young *et al.*, 2004) based on the exclusivity of the underlying culture, legal frameworks, and ownership types (Denis and McConnell, 2003).

This research contributes to the ongoing debate regarding the convergence of worldwide corporate governance policies, which has been driven by the current era of internationalization (Rubach and Sebor, 1998; Carati and Rad, 2000). Although increasing globalization requires high

standards of governance, the achievement of high governance standards may differ due to peculiarities that exist across markets. This testing of the determinants of FF in the setting of firms in transition economies reinforces the uniqueness of individual financial markets.

X. Limitations, Conclusions, and Areas for Future Research

The ownership concentration statistics were taken from annual reports that disclose substantial ownership. However, ownership concentration may indeed be higher as many shareholders in the Caribbean hold shares indirectly through private holding companies or relatives. The actual relationships with ownership concentration may therefore be even stronger than those displayed by regression results. The sample size used in this study is also considerably smaller than the samples used in corporate finance studies of developed markets. For example, Marchica and Mura (2010) used a sample size of 47,533 observations. While a larger sample size would have limited the influence of any outliers and increase the significance between variables, the sample size used was considered to be appropriate for the data analysis techniques employed. The data were also scrutinized for any extreme outliers.

In summary, the results of the testing of this framework show that the PP conflict of high ownership concentration is not completely negative for Caribbean firms. Further research is needed to ascertain the final impact of high ownership concentration on the value of firms in transition in such economies. Qualitative research is also needed to understand the cultural dimensions that may give rise to the differences in results shown across markets. These findings will allow researchers to reach a conclusion on the full impact of concentrated ownership structures on firm performance and value. Such a conclusion will further reinforce the need for targeted corporate governance policies to control the PP agency problem, and support the adoption of differing financial strategies adopted by the firm's management.

This research will inform the strategic financial decision-making of the firm, since the impact of ownership concentration on the firm's overall financial policies may at times be ignored. The importance of this finding cannot be overly emphasized since the advancement of capital markets in transition economies depends on the ability of corporate governance mechanisms to create confidence amongst potential investors.

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