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Analyzing the impact of financial sector growth on female empowerment: A focus on the United States of America

Anam Tariq¹ and Mansur Masih²

Abstract

It is believed that institutional economics takes into account factors that are often neglected in neo-classical economics. Of these is the role of cultural expectations, societal norms and gender-related expectations. To test whether gender does play a significant role in impacting an individual's well-being is our broad objective. On a more specific level, we want to test the effect of the presence and penetration of the financial industry, measured by deposit accounts and also represented by GDP growth in this paper, on female empowerment, measured by female labour workforce participation. We also use unemployment figures to check if it is affected in a similar fashion to our main dependent variable and if not, why there is a difference of impact between overall employment and that which is specific to the female gender only. We assume that active workforce participation represents an individual's level of financial independence and consequently, one's level of empowerment within the society. We use the Auto Regressive Distributive Lag(ARDL) technique to investigate an issue which is often studied based on a cross-country analysis rather than on a time-series scale. We also chose to make the United States of America our focus, as we would like to test if the impact on a developed country is similar to that of developing countries. Amongst our major findings are the lack of impact formal financial institutions seem to have on female participation in an economy, while we notice a significant level of correlation between unemployment, female participation and GDP.

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1.0 Introduction

For a country like the United States of America (from here on referred to as U.S.A./U.S.), which has suffered from two world wars and a great depression, all within the last 100 years, economic growth has been profound. The introduction of the Federal Reserve in the early 20th century as well as a number of regulations aimed at protecting trade and businesses, such as the establishment of the income tax, and the growth of the automobile industry and its impact on other trade sectors, have all helped lay strong foundations for a productive economy in the past. During the banking crisis that occurred during 1929-1933 the then president Roosevelt passed on the Emergency Banking Act, which required banks to operate under the U.S. Treasury's supervision. It was during this time that the unemployment rates in the U.S. reached record high levels of 25%. However, it is believed that women were not as heavily impacted by this crisis as were unskilled men residing in cities. It was also during this time that the government took initiatives to start infrastructure projects, the aims of which involved the employment of such people. During the early 1940's, it is estimated that six million women were mostly temporarily employed in the manufacturing and production industry as many of the men went for the Second World War.

Our focus in this study is on the post-World War II era (from 1955 onwards), which is known as a 'golden era of economic growth' for the U.S. due to huge increases in overall GDP and productivity as well as a drastic increase in prosperity and population growth i.e. the 'Baby Boom'. With the coming of the 21st century also came the advent of computers, the collapse of the Gold Standard, the dot-com boom and then ultimately the recent sub-prime crisis.³

In terms of the income equality gap, it has been increasing for the whole society from the 1970's onwards, with relatively low residual income figures compared to the pre-income tax reduction values. According to one statistic⁴ the U.S. ranks in the 30th percentile in terms of equitable

³http://en.wikipedia.org/wiki/Economic_history_of_the_United_States

⁴http://en.wikipedia.org/wiki/Income_inequality_in_the_United_States

distribution, which means that 70% of other countries have a more equitable system of income distribution in place. As of 2012, the top 1% of the richest individuals in the U.S. owned approximately 40% of the country's wealth. To address this issue, 2012 saw the introduction of the American Tax Payer Relief Act, which involved higher income tax rates being charged on individuals earning above \$400,000. This is after the increase of the minimum wage to \$7.25 in July 2009, to protect those with the lowest wage earnings.

One interesting finding was that based on a 2004 study, according to which income inequality figures in a society may not be as high if we take into account income based on the size of a household. In this day and age, when we consider that often both the husband and wife are earning a living, this substantially reduces the income inequality figures as each household is now supported on two incomes, rather than just one. On the other hand, the drastic increase in divorce rates and in households being supported by single parents over the past decade have meant that there is a greater need for women to be earners as they are often the sole breadwinners for themselves and their children.

Two industries that accounted for highest earners in terms of more men than women were the sectors of construction and manufacturing. More than 1 in 4 highest earning men work in these industries, compared to every 1 in 10 women.

When it comes to income equality, for a country like the U.S., there are certain social norms as can be seen from the spread of industries in which women are more likely to dominate compared to men. The highest percentage of women compared to men can be found in the fields of education and healthcare, and this is also where the lowest income for women stems from, based on numbers. In terms of female empowerment, our focus is not on income levels as much as it is on overall female labour workforce participation.

According to DiNatale and Boraas (2000) about three quarters of women in the U.S. aged between 24-35 years participated in the workforce in 2000 compared to slightly more than half of them back in 1975. They say that this latter generation grew up in an era where they were expected to combine household responsibilities while pursuing a career side-by-side as well.

Besides this, the latter generations have more years of education on average and women in specific have managed to greatly reduce the earnings gap with men, with a rise from 68% to 82%

between 1979 and 2000. Other interesting statistics include the fact that mothers are more likely to be part of the active labour workforce, and amongst different races, black women tend to have more full-time jobs compared to white and Hispanic women. DiNatale and Boraas go on to say that *the greatest impact (has been from) the increasing rates of educational attainment among women and the lower propensity to marry among women aged 25 to 34. In 1975, the median age at first marriage for women was 21.1 years; in 1998, it was 25.0 years.*⁵ Moreover, according to their figures, the percentage of women in managerial, executive and administrative positions has increased by 12% between 1983 and 2000.

However, the question we would like to ask is, how much of this progress, in a country like America, which stresses on equal rights for all its citizens, has been as a result of the development of the financial sector?

While much of the literature regarding women empowerment in different countries has been on the significant impact of non-banking financial institutions including those solely dedicated to microfinance (Swamy, 2014), there have been other studies that have arrived at mixed results on this impact of microfinance (Navajas et. Al, 2000. Kabeer, 2001).

The focus for this paper is solely on formal financial institutions and this is why we have used the variable of U.S. current and deposit accounts as our relevant variable for financial inclusion. There is significant literature on the impact that formal financial institutions have had on developing countries such as India, those of Africa and those of South East Asia. However, we want to study a developed country and see if over the past 59 years, there has been a significant impact of the financial sector on female involvement in the economy, while we understand that variables such as education, marriage and generational gaps have often been cited as important components affecting such an analysis. The theoretical underpinnings of this analysis are further explained below.

It has been observed by a number of studies that financial inclusion generally leads to economic growth and individual empowerment. The argument that greater access and availability of financing allows for a potentially higher circulation of wealth in the society, is often strongly

⁵The Labour Force Experience of Women from 'Generation X'. Bureau of Labour Statistics
<http://www.bls.gov/opub/mlr/2002/03/art1full.pdf>

advocated by notable researchers (Schumpeter, 1911. Klapper, Laeven and Rajan, 2006. Beck, Demirguc-Kunt and Levine, 2007).

There are those who say that monetary policies that involve reserve requirements and interest rate ceiling rates are detrimental to economic growth (McKinnon and Shaw, 1973) and in this way, financial sectors can significantly impact a society in a negative way. An excellent example of this is the recent 2008 subprime crisis that involved huge levels of leveraging by financial institutions in the U.S. There are those who outright deny the effects of financial expansion on economic growth and societal well-being (Lucas, 1988) while there are others that state that the relationship between the two is bi-directional where each has an effect on the other (Luintel and Khan, 1999).

Our specific focus, however, is not so much on the relationship between economic and financial growth as it is on the relationship between these two and female empowerment. For our study, we choose to attempt our analysis keeping in mind that not only are both economic growth and financial growth correlated positively, but that they are also expected to have a significant level of correlation with the empowerment of women, which is being measured by their level of financial independence, in this case. We also take into account the variable of unemployment, as it helps us to compare overall financial well-being with that specifically of girls and women.

It has been observed that, when analyzing the relationship between economic and financial growth, studies using cross sectional data analysis have often showed positive results while those using time series and cross panel data have shown contradictory or inconclusive results (Khan et. Al, 2005). We aim to carry out a time-series data analysis to understand the long-term impact of the financial sector on a specific group of society i.e. women who are of a working age. We hope that by carrying out this study, we not only focus on this group of people but also on whether financial sector development can truly play a major role or if there are perhaps other bigger factors at play in the influencing of female empowerment, in a country known to be economically and socially sophisticated in terms of individual liberty and rights.

We have found that for the U.S., long term data does not show any form of strong linkages between female participation in the workforce and financial sector growth. We did observe significant correlations between unemployment levels, GDP levels, and active female labour workforce participation. As expected, GDP growth allows for lower unemployment levels.

However, unexpectedly, higher unemployment rates seem to have positive effects on female participation within the economy. We note that there is an inverse relationship between the two, and a potential reason for this could be that periods of slumps or recessions allow for females to take become more socially and economically active, as they are less costly to employ based on the income inequality data we have studied. We would have also potentially given the reason that because periods of high unemployment are often coupled with low interest rates, this may make it easier for women to have access to financial institutions which may be more open to lending out to them. However, we cannot make this conclusion as our analysis seems to show that perhaps, there may be no strong linkage between the two after all.

We now move on to the next part of our paper which starts off with the Literature Review, followed by the Methodology section where we elaborate on our use of data and analysis technique, which is then followed by our Empirical Analysis of the results and finally, the Conclusion.

2.0 Literature review

According to Demircuc-Kunt, Klapper and Singer's (2013) study of the correlation between gender and usage of financial products and services, there is a significant gap of this usage between males and females. This is observed based on a sample of 98 developing countries while also controlling for variables such as education, rural vs. urban living and employment status. The authors also highlight the importance of legal regulations that influence the gender inequality gap as well as cultural norms of what the society expects from women, including whether or not they should work, the level of violence against women, whether they got married early or even receive an inheritance.

According to Narain (2009), factors that limit women's access to finance limit the growth potential of a country by almost half. Demircuc-Kunt, Klapper and Singer (2013) also note that gender interactions can also influence the ease with which women move around within a society and if they find it easy to access financial institutions and their services. An example of this is a country like Saudi Arabia, where women are not allowed to drive, and there are not many

options of public transport for them to make use of. However, due to the government's recent 'Saudization' initiative to boost employment of local Saudi females, it is possible that there has been an increase in their use of financial services, indicating a demand-following rather than a supply-leading relationship between economic growth, employment and demand for financial services (Patrick, 1966).

It is true however, that factors such as financial growth and economic growth are reflective of a number of other factors including government policies, institutions, and different stages of economic and financial development that countries are in (Badun, 2009 and Odhiambo, 2009). This is the macroeconomic perspective of the impact on a society as a whole. To illustrate on a more microeconomic scale, it has been observed that women who are supported by their husbands in being heads of households and in having their own independent bank accounts are likely to be more aware of financial products and services and more open to using them (Fletschner and Mesbah, 2011). This is further reconfirmed by another study done on nine Sub-Saharan countries of Africa. According to this study, the main factors affecting a female's access to finance depends on differences in education levels, income levels, being the head of the household and having formal employment (Aterido, Beck and Iacovone, 2011). This indicates the close relationship between a woman's financial independence in terms of her income and her access to financial products and services.

Another startling finding has been that of Muravyev, Schaefer, and Talavera (2009) according to whose cross-country analysis, financial institutions are more likely to not be as supportive of female entrepreneurs as of male entrepreneurs. Furthermore, such institutions are likely to charge higher interest rates to female entrepreneurs, potentially as a result of seeing them as of greater risk of credit or default risk, compared to male entrepreneurs.

This is in contrast to Swamy's (2014) findings that financial inclusion programs targeted towards the poor women of rural India have in fact improved their livelihoods through the

On a more relevant level to our specific study of the U.S.A., it seems that previous studies have shown that countries such as that which is our focus as well as others including New Zealand, Canada and the United Kingdom, also known as high-income countries, do not show major differences in the access to financial services based on a gender bias. They explain that the

difference between the use of financial services is simply explained by the demand for them (Buvinic and Berger, 1990. Coleman, 2000 and 2002).

However, this could be explained as a result of such economies having already reached a certain level of economic sophistication, of a benchmark of economic and social development, which is yet to be matched by poorer developing countries, often referred to as “third-world” countries.

One of these countries, Pakistan, was our initial country of interest. According to Safavian (2012), unmarried women are often considered to be high-risk and are usually denied any form of financing while women are considered incapable of being guarantors and are required to take permission from their husbands in order to apply for a loan. This not only limits the potential of women but also reduces their opportunities to use financing for their own advancement.

In the case of the U.S.A., however, a country such as this does not face these kind of hurdles or discriminations. Women in the U.S. are more likely to choose the level of financial services they want to make use of and unlike other countries, are not considered financially illiterate (Lusardi and Tufano, 2009). They are also not considered to be lacking technical experience or business experience, as is the case in other countries (Carter et. Al, 2003).

Unlike all these limitations that apply to other countries, a country like the U.S. is of great interest as it is meant to be one where many of these hurdles have been overcome decades ago due to a number of federal and national rules and regulations protecting the rights and ensuring the liberty of its individuals. Given all this, we want to investigate whether financial sector development has the same level of an effect on this country and its female workforce. It could however, perhaps be that it is as Coleman (2002) has found regarding developed countries and the disconnect between the two variables.

We will now move on to specifying our specific model based on the data mentioned above and the relationship between them that we wish to observe.

3.0 Methodology

3.1 Model Specification

Based on the views of the authors mentioned as well as our need to test the theory, our model would require the active female labour workforce of the US to be dependent of not only GDP growth but also of financial inclusion, which is measured through the level of deposit accounts over the years. We have also included the percentage of unemployment as a control variable to see how it is not only affected by the other two independent variables but how it too may be dependent on them and what strength of a correlation it has with the active female labour workforce.

Our model is then estimated as

$$LFELAB_t \sim \alpha + \beta_1 LUNEMP_t + \beta_2 LUSGDP_t + \beta_3 LDEPOS_t + \epsilon_t$$

where LFELAB represents the active US female labour workforce from the ages of 15 to 64; LUNEMP represents the seasonally adjusted percentages of overall unemployment of the country; LUSGDP represents GDP figures over the past 58 years and LDEPOS represents the spread of US banks and the growth of their deposit accounts over the years. Finally, the last variable ϵ_t is meant to represent the error term of the equation. We have intentionally written the model in the Vector Error Correction Model form even though we are not following the traditional time-series analytical method. We have however, refrained from putting the equality sign in this initial stage.

We expect the relationship between LFELAB, LUSGDP and LDEPOS to be a positive one i.e. the active female labour workforce is expected to increase with an increase in economic growth, which is being measured by GDP as well as in an advancement in financial inclusion, which is being measured by the number of deposit accounts, LDEPOS.

On the other hand, LUNEMP is expected to have negative relationships not only with LFELAB but also with LUSGDP and LDEPOS.

3.2 Estimation Procedure

Our aim is to try and establish a long-run relationship between the concepts of female empowerment and economic and financial growth. The popular ideology is that financial inclusion has a number of advantages due to the effects it has on the society. One of these propagated advantages is the potential influence an increase in financial inclusion should have on reducing the gender inequality gap.

To test this theory, we decided to implement a cointegration analysis using time-series data.

We started off the initial process by carrying out the Engle-Granger and Johansen Tests to check for cointegration. However, upon doing so, we did not find any cointegration using the Engle-Granger test. Furthermore, our initial unit root tests using the Augmented Dickey Fuller (ADF) test and the Phillips-Perron (PP) test showed some discrepancies. The resulting outcome was such that a variable expected to be non-stationary was showing stationary results while the Engle-Granger test also did not show cointegration between variables.

For these reasons, we decided to use the Auto Regressive Distributive Lag (ARDL) approach instead, which was first introduced by Pesaran (1997). Using ARDL, we are not compelled to categorize the regressors into either zero or one cointegration, as is the case in the standard cointegration analysis procedure. ARDL involves establishing a lag order, which we took as 3 in this case based on the values of the Akaike Information Criterion (AIC) and the Schwarz Bayesian Criterion (SBC) values. AIC and SBC help ensure that the variables are not integrated on an order higher than one. They also help ensure that the relationship between the variables is not spurious, or short-lived.

We then test for the F-statistic of the variables to see which is endogenous and which is exogenous in the long run based on the lagged values of the error correction form. If the statistic falls within the 90% significance critical bounds, the results of causality remain inconclusive. In

order to establish whether a variable is endogenous, its F-statistic must exceed the upper bound value.

Once we have established the dependency or independency of variables, we can analyze their coefficients to understand the strength of the correlation between them better.

We are also looking to analyze the level of autocorrelation, heteroscedasticity and normality between our variables.

According to Pesaran and Shin (1999), ARDL helps to indicate the true measure of endogeneity amongst variables. The analysis starts off with the null hypothesis assumption of no cointegration. Based on the F-statistics and the critical bound values provided by Pesaran and Pesaran (1997), we evaluate the level of dependence and causality between variables.

The model, based on ARDL, can be written as follows:

$$\Delta LFELAB_t = \alpha + \beta_1 \Delta LUNEMP_{t-3} + \beta_2 \Delta LUSGDP_{t-3} + \beta_3 \Delta LDEPOS_{t-3} + \delta_1 LFELAB_{t-1} + \delta_2 LUNEMP_{t-1} + \delta_3 LUSGDP_{t-1} + \delta_4 LDEPOS_{t-1}$$

Where Δ indicates the change or difference between three lags i.e. stationary data of variables while the δ indicates the error term values, which are stationary yet not in their differenced form. By keeping the error term this way, we are able to check for cointegration in the long term, without removing the theoretical components of the data. The 't-3' indicates the optimal number of lags, as determined by the AIC and SBC values, which in this case is 3 lags. Our null hypothesis is that there is no cointegration and this is defined by $H_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$ while the alternative is that $H_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 \neq 0$.

3.3 Data description

The initial idea behind this analysis was to use variables derived from the World Bank that would be precise indicators of changes in the level of women empowerment over the years, in

the USA. We were initially considering variables such as number of female entrepreneurs, ratio of male to female labour workforce, participation of females in the workforce as a percentage and others. However, when we attempted to implement a time-series analysis using such variables, to test their long run relationship with economic growth and financial sector advancement (i.e. using variables such as GDP, number of bank branches per 1000 km, number of ATMs, etc.), we realized we were not able to do so due to the lack of sufficient observations. We were compelled to use more general measures which involved us accounting for data availability, sufficient frequency of observations and authentic data sources. Our initial objective was to focus on a Muslim-majority country, in order to evaluate the difference of Islamic versus conventional finance in impacting the role and empowerment of women. We initially chose to focus on Pakistan, a developing country that has an established Islamic finance industry and great potential in reducing gender inequality gaps. However, we were not able to find sufficient levels of data to carry out a time-series analysis based on data about Pakistan.

With these lessons learned through our attempts, we chose to focus on data derived from the Thomson Reuters Datastream database. Based on the availability of data, we chose to focus on a country that has undergone massive economic growth in the past 200 years, from industrialization in the 19th century to a focus on the service industry in the 20th and 21st centuries and to finally being currently considered as the world's 'superpower'. Our focus on the United States of America is not simply because of the availability of years of data, even though this was one of the motivating factors behind this study. Even though our focus is on this country, we aim to carry out a deductive rather than inductive study, where we use the example of a country that has already surpassed the hurdles of gender inequality in many ways. We want to study the example of the USA and see how it could potentially be applied to the current developing countries which are in the process of reducing this inequality gap.

The four variables considered in this study are the quarterly data figures of USA's GDP; the country's seasonally adjusted unemployment rate; statistics of US banks with currency and checkable deposit accounts; and the active female labour workforce population, between the ages of 15 and 64. All figures span a time period from the first quarter of 1955 to the last quarter of 2014. By using such variables, the attempt here is to assess the level of dependence of the female labour workforce levels to changes in the financial sector and changes in economic growth. The

unemployment figures help to show us whether changes in the economy and in the financial sector have the same type of impact on employment as a whole, as they do on female workforce participation specifically. The percentages of unemployment indicate the impact of these variables on the society as a whole whereas the female labour workforce variable is specific to one gender only. We are interested in seeing if both variables react similarly to changes as this too, may indicate that advancements in the standards of living in a society may not necessarily indicate improved standards of living for women.

We therefore expect the variables of female labour workforce, referred to as ‘FELAB’, and the unemployment variable, referred to as ‘UNEMP’, to be relatively dependent on the USA GDP, referred to as ‘USGDP’, and on USA’s banks’ deposit accounts’ growth, referred to as ‘DEPOS’.

Our primary focus, however, is to study the impact of USA’s GDP (USGDP) and USA’s financial sector growth (DEPOS) on the level of female financial independence and empowerment (FELAB). The effect of the former two variables on USA’s unemployment growth (UNEMP) is meant to be compared to that on FELAB.

4.0 Empirical analysis

4.1 Unit Root Tests

Based on the AIC and SBC highest values, we were able to determine the non-stationarity of level form variables i.e. LFELAB, LUNEMP, LUSGDP and LDEPOS and the stationarity of the differenced variables i.e. DFELAB, DUNEMP, DUSGDP and DDEPOS. We carried out the ADF, PP and KPSS tests to do so while also using the highest AIC and SBC values to see what lag order would be most appropriate to use for our next steps.

Variables	No. of lags	ADF Test		PP Test	
		Test Stat	Critical Value	Test Stat	Critical Value
LFELAB	4	1.525	-3.4022	0.43424	-3.406
LUNEMP	1	-3.6965	-3.4391	-2.124	-3.406

LUSGDP	2	-1.4367	-3.4257	0.70413	-3.406
LDEPOS	3	-1.6558	-3.4102	-1.7872	-3.406
DFELAB	3	-3.9516	-2.9211	-20.0703	-2.8603
DUNEMP	3	-7.1013	-2.9211	-6.18	-2.8603
DUSGDP	1	-7.9195	-2.8879	-11.0785	-2.8603
DDEPOS	2	-8.0924	-2.0953	-13.671	-2.8603

We expected the test statistics for the level form variables to be less than the critical values while those of the differenced form variables to be higher than their respective critical values. Based on the values from the results, we noticed a discrepancy in the ADF results for LUNEMP but this was not the case when we carried out the PP test. We therefore, choose to focus on the PP test result. All the other variables have the expected results. These values are indicative of a potential long-run relationship between the four variables which is not superficial or shallow in nature, which will be further ascertained in the following sections.

4.2 Cointegration Analysis

We then proceeded to carry out the F-test to see which variables showed F-statistics beyond the upper critical bound. Such variables would then be considered those that are significant to the equation and that have a long-run relationship with the others. Below are the results of the F-test based on 236 quarterly observations:

LFELAB	28.3013**
LUNEMP	4.6335*
LUSGDP	2.4782
LDEPOS	2.0299

*** and * means cointegrated at 5% and 10% significance levels based on bounds of 2.425-3.574 and 2.85-4.049*

The results show that both LFELAB and LUNEMP have long-run cointegrating relationships with LUSGDP and LDEPOS and with each other. Now that we have observed this, we need to estimate the long-run coefficients and see if they are significant in showing the variable's endogeneity based on the T-ratios and the p values.

4.3 Static Long Run results

We start off by carrying out the long-run coefficient analysis with LFELAB as our dependent variable, as we predict it to be. Below are the results based on the AIC values.

Long Run Results for LFELAB based on AIC. ARDL (3,2,0,0)			
Variable	Coefficient	Standard Error	T-Ratio [Prob]
LUNEMP	0.54259	0.39834	1.3621 [.175]
LUSGDP	2.1273	1.1453	1.8574 [.065]
LDEPOS	-0.53688	0.46773	-1.1478 [.252]
INPT	-9.0538	10.5812	-.85565 [.393]

Our results show that there are no significant long term coefficients as none of the T-ratios are above 2 nor are their probability values below 5%. The closest significant variable is that of GDP where the positive coefficient indicates that a rise in GDP by 1% should help improve female workforce participation by 2.12 in number, under a 10% significance level.

We then considered the long run coefficients of our second significant variable based on the F-statistics. Below are the results when LUNEMP is taken as the dependent variable.

Long Run Results for LUNEMP based on AIC. ARDL (3,0,3,0)			
Variable	Coefficient	Standard Error	T-Ratio [Prob]
LFELAB	1.9062	0.93095	2.0476 [.042]
LUSGDP	-1.3743	0.77513	-1.7730 [.078]
LDEPOS	-0.2565	0.34367	-.74635 [.456]
INPT	-4.6672	5.8376	-.79951 [.425]

When we took LUNEMP as our dependent variable, we see that its coefficient with LFELAB is significant and that interestingly, they share a positive relationship due to the positive coefficient. Although this result is somewhat confusing given that a rise in unemployment may indicate a larger female participatory workforce, a potential cause for this could be that, when a country like the US faced higher levels of unemployment, this allowed for greater opportunities for both genders. It is also a well-known phenomenon that women tend to be paid less than men for the same jobs with the same responsibilities. Given this fact, it may be that in periods of high overall unemployment, society has been more inclined to employ labour that is willing to work at lower costs, i.e. women over men.

The second relatively significant coefficient is that of LUSGDP, which appears to have a negative long run coefficient with LUNEMP. This is a relatively expected result, as higher levels of GDP and economic growth are supposed to reduce unemployment levels. The negative coefficient of 1.37 is indicative of the above theory and proves it to be consistent in this case, albeit at a lower significance level of 10%.

According to our results, the variable of financial inclusion and development, LDEPOS, does not feature significantly in either of the two dependent variables' long run estimation results. This means that our results show a lack of a significant long-run relationship between female workforce involvement and overall workforce involvement and the impact of financial institutions. Furthermore, even at an insignificant level, although LDEPOS is negatively related to unemployment rates, it also seems to be negatively related to female workforce participation.

Truly, it could even be said that given the 2008 financial crisis, such figures for female workforce participation may not be surprising as financial institutions played a big part in the job sector shrinking and unemployment rates rising, especially for women, who are not as often in top managerial positions compared to men. Many of the upper level management positions remained secured during the crisis and this may be indicate in these results.

Based on this analysis, female workforce participation does not seem to be significantly correlated with either the GDP or the penetration of banking activities in the economy. This is despite the high level of cointegration we found between LFELAB and the other variables.

4.4 Short Run Results

Short Run Results for LFELAB			
Variable	Coefficient	Standard Error	T-Ratio
dLFELAB1	-0.46391	0.062633	-7.4069[.000]
dLFELAB2	-0.28742	0.061763	-4.6536[.000]
dLUNEMP	0.019495	0.016785	1.1615[.247]
dLUNEMP1	-0.036936	0.016533	-2.2342[.026]
dLUSGDP	-0.029314	0.010502	-2.7913[.006]
dLDEPOS	0.0073981	0.0032176	2.2992[.022]
ecm(-1)	0.01378	0.011144	1.2365[.218]

In the short run, LFELAB does not hold significant values for its error correction term. Neither is the T-ratio above 2 nor is its probability significant at the 5% or 10% levels. However, in terms of coefficients of other variables, LDEPOS, LUSGDP and LUNEMP do all influence LFELAB significantly at the 5% level. The statistically insignificant error term indicates a lack of a true cointegrating short-run relationship between LFELAB and the other variables, which is also reflected in the long run results above. However, in terms of each variable's individual coefficients, LFELAB seems to be correlated with them for short-term data. Unlike the long run results, LUSGDP does not have a positive correlation with LFELAB in the short-run. A possible reason for this may be that short term growth in GDP may have a positive effect on overall employment levels but perhaps not so much on employment levels specific to women. Also, as expected, higher unemployment levels are negatively correlated to FELAB levels while a potential growth in US banks and their deposit accounts by 1% is expected to increase female workforce participation by 0.007 units in the short-run, while in the long-run, there is no significant impact.

We now look at the second dependent variable in this equation, UNEMP.

Short Run Results for LUNEMP			
Variable	Coefficient	Standard Error	T-Ratio
dLUNEMP1	0.1635	0.065625	2.4914[.013]
dLUNEMP2	0.10734	0.05787	1.8548[.065]
dLFELAB	0.06097	0.031362	1.9441[.053]
dLUSGDP	-3.443	0.27224	-12.6471[.000]
dLUSGDP1	-1.5093	0.34524	-4.3718[.000]
dLUSGDP2	-0.56034	0.35321	-1.5864[.114]
dLDEPOS	-	0.0095437	-.85966[.391]
ecm(-1)	-0.031985	0.01071	-2.9863[.003]

The results for UNEMP are more in-line with our initial expectations, as we see that the error correction term is statistically significant at the 5% level. This is indicative of an actual cointegration existing between UNEMP and the other three variables. Even though the short-run coefficient for DEPOS is not significant, the coefficient for GDP is highly significant while the coefficient for FELAB is significant too. This indicates that financial development does not play a major role in reducing unemployment or in improving female workforce participation in the short run or in the long run but GDP plays an important role in significantly reducing unemployment levels. In this case, a 1% GDP growth would hypothetically reduce unemployment by 3.4%, given all other factors remain constant. Moreover, the relationship between UNEMP and FELAB is such that, although not as strong a relationship as UNEMP and USGDP, unemployment levels still seem to share a positive correlation with levels of female workforce participation, as indicated from the long-run results as well.

4.5 Diagnostic Tests

Diagnostic Tests for LFELAB		
Test Statistics	LM Version	F Version
a. Serial Correlation	CHSQ(4) = 151.0569[.000]	F(4,224) = 98.4277[.000]
b. Functional Form	CHSQ(1) = 14.4559[.000]	F(1,227) = 14.7453[.000]
c. Normality	CHSQ(2) = 169.7621[.000]	NA
d. Heteroscedasticity	CHSQ(1) = 46.6659[.000]	F(1,235) = 57.6171[.000]

There seems to be a minor component of discrepancy in the functional form values. However, this discrepancy is much bigger in terms of the heteroscedasticity component. A potential cause for this could be the differing number of lags observed in the ARDL estimation of cointegration (Shrestha and Chowdhury, 2005).

Diagnostic Tests for LUNEMP		
Test Statistics	LM Version	F Version
a. Serial Correlation	CHSQ(4) = 4.9000[.298]	F(4,223) = 1.1770[.322]
b. Functional Form	CHSQ(1) = .52715[.468]	F(1,226) = .50381[.479]
c. Normality	CHSQ(2) = 1.6349[.442]	NA
d. Hetersoscedasticity	CHSQ(1) = .52750[.468]	F(1,235) = .52422[.470]

As for LUNEMP, this variable passes all tests and does not seem to hold any issues in terms of autocorrelation, functional form misspecification or heteroscedasticity albeit at negligible levels of significance. This may indicate that UNEMP is a much better dependent variable compared to FELAB, where unemployment as a whole, which includes both men and women, is more likely to be affected by the other variables, excluding the deposit account and financial penetration in the economy, which remains insignificantly correlated to both dependent variables.

5.0 Conclusion

Based on our empirical analysis of quarterly data derived from the past 59 years on the U.S. financial, economic and employment figures, we have not been able to derive any substantial relationship, either positive or negative, between the variables representing financial sector growth and female workforce involvement and empowerment. An interesting observation was that neither did our second dependent variable, unemployment, have any strong linkage with the financial sector development, while it did show stronger long-term relationships with female labour participation and GDP, compared to our main dependent variable. Unemployment also seems to have an inverse relationship with female participation in the workforce, and this finding coincides with views of the specific dynamic under which women are perceived within the workforce, which includes lower pays and job positions not always held in the high-income strata. This perhaps allows women to be considered almost 'more adaptable' during periods of economic downturns, thus making their involvement more influential.

We believe the cause for this can be due to a number of reasons. As stated above, time-series analysis often tend to be inconclusive regarding this relationship, even though cross-sectional analyses tend to show positive linkages between the two. We also understand that a lack of short-term and long-term correlation may be due to our own analytical limitations, which involved using only four variables, when there are a number of important variables, such as levels of education, changes in government regulations, changes in perceptions and others, which we have not been able to include in our study. We realize that this study is not comprehensive as it does not account for a number of variables and controls that need to be implemented, considering the

number and degree of changes that have taken place in the U.S. over these past 59 years. We believe this research requires fine-tuning given the availability of data and a way of quantifying certain variables that are qualitative rather than quantitative in nature.

We initiated this study bearing in mind that there have been differences of opinion on this relationship based on the past research carried out. We hope that this work helps to highlight some of the challenges of evaluating such data, and that perhaps the answer is not always absolutely clear but that continued investigation needs to be carried out and research bearing in mind all the additional variables not included in this study.

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