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DYNAMIC GENDER-SENSITIVE MACROECONOMIC GROWTH MODELS: LESSONS FROM THREE DEVELOPED ECONOMIES-USA, FINLAND AND SWEDEN

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Abstract

The study estimated gender sensitive macroeconomic endogenous systems using TSLS for 10 endogenous variables including GDP, capital formation, openness, FDI, savings, wealth, female employment, male employment, and both female and male labor force participation rates for the USA, Finland and Sweden; and a pool of fiscal, monetary, social and commercial policy variables. The study established that the relationship between economic growth and gender disaggregated LFPR can be studied using either single equations or simultaneous systems depending on the causal relationships between the two; that economic growth does not necessarily lead to an increase in female/male LFPRs; that female LFPR can enhance male LFPRs and vice versa; that increasing the female LFPRs can increase saving while increasing male LFPRs can increase capital formation; that openness can have a positive effect on male LFRPs but a negative effect on female LFPRs; and that the endogenous variables, including real GDP as well as the policy variables investigated had gender disaggregated effects on the LFPRs that may vary across *countries. It is recommended that policy makers in different countries attempting to increase LFPRs of both females and males should undertake rigorous macroeconomic dynamic analysis to identify the macroeconomic variables (including but not limited to economic growth variables) as well as the specific fiscal, monetary, social and commercial variables that have either positive or negative effects on the gender disaggregated LFPRs; and based on the findings, to design active labor market, fiscal, monetary, social and commercial policies that can increase gender equality as well as lead to economic growth.*

JEL classification: O47, J16, J21, J82, C30, O23, J01

Key words: Gender disaggregated Labor force participation rates and employment, simultaneous equation systems, gender-sensitive dynamic macroeconomic economic growth models, policy variables.

1. INTRODUCTION

Several researchers (Kottis, 1990, Goldin, 1994, Cağatay and Özler 1995, Mammen and Paxson 2000; Tansel, 2002; Clark, York and Anker 2003; Lincove, 2008; Fatima and Sultana, 2009; Luci, 2009; and Tam, 2011) investigated the relationship between economic development and labor force participation and reported a U-shaped relationship; which according to Goldin (1994) was a consequence of structural shifts in economy, influence of income and substitution effects and increase in education levels of women in the population. Lahoti and Swaminathan (2016), further indicated that economic growth as well as its dynamics are key to increasing women's economic activity.

The inverted U-shaped relationship if it holds, would imply that an increase in economic growth can initially lead to declines in LFPRs of females but this situation is eventually reversed to yield increases in LFPRs as GDP increases. This implies that at a certain point in time economic growth can have either a positive or negative effect on female LFPRs. The relationship between the two depends on the stage of growth that the economy is at. The stages of growth include the traditional society; the preconditions for take-off; the take-off; the drive to maturity; the age of high mass consumption (Rostow,1959). As the economy moves from an agrarian society (with close linkages between household and market production) to an industrial and services-based formal economy, female labor force participation rates fall. However, during the latter stages of development, spurred by structural changes and other changes which occur, female economic activity increases. Whether the same U hypothesis holds for male labor force participation rates has not been well established.

Gaddis and Klasen (2012) argued that sector specific rather than aggregate GDP should be investigated for their impact on women's labor supply and also high-lighted the potential endogeneity of GDP with female labor force participation rates. However, unlike earlier findings of a U-shaped relationship, they find no clear relationship between economic growth and FLFP, yet it is widely argued that economic growth is good and is necessary for increasing FLFP, which in turn will contribute to alleviation of poverty resulting from many factors, including but not limited to gender inequality particularly with regard to economic empowerment. Empowering a greater population is in turn expected to generate economic growth. According to Kabeer and Natali (2013), economic growth is necessary for enhancing gender equality, however, its impact on different measures of inequality depends on nature of the existing gender inequalities. This would imply that the effect of economic growth of LFPRS of men and women will depend on the existing gender gap between the LFPRs of females and males.

Some of the dynamic factors of economic growth that cause changes in LFPRs of female include structural shifts in the economy, increase in education levels, reduction in fertility rates, changing wage levels (as the wages level increase, the substitution effect increases relative to the income effect, and eventually dominates the income effect); and new socially accepted service sector jobs. Changes in wage levels are associated with both substitution and income effects (Goldin, 1994; Gaddis and Klasen, 2012; Lahoti and Swaminathan, 2016). As the wages increase, the substitution effect increases relative to the income effect, and eventually dominates the income effect. The structural shifts can lead to changes in sectoral composition whereby the industrialization and service sector jobs increase but agricultural activities decrease). These changes can influence LFPRs of both men and women but the effects may differ depending on the circumstances that both face. These findings underscore the need to investigate the simultaneous effects of the dynamics of economic growth and gender disaggregated labor force dynamics.

Traditionally, attempts to investigate the feminization U hypothesis relied largely on ordinary least square (OLS) estimations on the pooled sample (e.g., Cağatay and Özler 1995), whereby parameter identification is based on cross-sectional variation. This means essentially that data on female labor force participation from countries at different income levels are used to infer the relationship within a single country over time. In such cases, causality was running from economic growth (measured by GDP per capita) to FLFPRs but other researchers such as (Gaddis and Klasen (2012), have high-lighted the possibility of an endogenous model and the need to use sector specific value added rather than aggregate GDP levels. Following this argument, it is necessary to determine whether economic growth is simultaneously determined with gender disaggregated LFPRs and to use a dynamic model to investigate the relationship between the two if endogeneity exists.

Suffice to say that several researchers have investigated: i). the factors influencing aggregate/gender disaggregated LFPR, particularly of the FLFPR, leaving out those influencing MLPFR; ii). effect of GDP among other factors on aggregate or gender disaggregated labor force participation rates, using single equation analysis, yet a potential endogeneity of the two exists, which implies the two are part of the general endogenous macro-economic model for a given economy

The purpose of the study is to investigate the economic growth/gender disaggregated labour force participation nexus based on a dynamic system. This study treats both labor force participation rates of both males and females as well as economic growth as endogenous variables (except where causality indicates otherwise) and applies the endogenous growth theory to study their simultaneous effects for selected countries- Finland, Sweden and USA. Also, the employment variable in the usual macro-economic model is gender disaggregated in this case. No similar research has been conducted for those countries. The findings can be used to inform other countries aiming at increasing gender equality in labor force participation rates and increasing economic growth. The ultimate aim of the research is to unpack the dynamics inherent in the economic growth -labour force participation nexus, and to provide empirical evidence that can be used to guide policy both in developed and developing countries.

2. METHODOLOGY

2.1. Model Specification

The basic model for GDP is based on endogenous growth theory, whereby the growth of output is determined simultaneously with several endogenous variables including capital formation, employment, FDI, and the indirect benefits that FDI embodies**,** and openness of the economy to international trade. Based on the arguments advanced above, the labor force participation rate is added as an additional endogenous variable. The endogenous variables are determined by the exogenous variables, which include but are not limited to, government policy variables.

As stipulated by endogenous growth theory, growth of output is a function of capital formation, employment - which in this case is gender disaggregated-, foreign direct investment (FDI) which has indirect benefits such as human resource development, new technology transfer (Solow, 1970; Lucas, 1988 and Romer, 1990), and opening up of the economy to international trade. These endogenous variables are influenced by several exogenous variables, including government policy variables such as taxes and government spending.

Specifically, the dynamic model in this case had several endogenous variables including real GDP (GDP), real domestic capital formation (real gross fixed capital formation) (KAP), employment of females for the formal age group (FEM1564), employment of males for the formal age group (MEM), real Openness (OPEN), real foreign direct investment inflow (FDI), real gross domestic saving (SAV), real wealth (W), female labor force participation rates for the formal age group (FLFPR1564) and male labor force participation rates (MLFPR1564). The total number of endogenous variables for the USA was 10, while that for Sweden and Finland was 9. The number and type of predetermined variables (particularly the exogenous variables) were dictated by the data availability. The exogenous variables include fiscal, monetary and commercial policy variables as well as social variables. Employment of the 65 plus age groups for both males and females are treated as exogenous variables and so are the corresponding LFPRs for the two groups.

The endogenous growth model adapted for this study is similar to that of Bende-Nabende and Ford (1998) and Ford, Sen and Wei (2010) but differed in many respects. Firstly, the current model eliminated TECH, and HK for all the three countries investigated while WEALTH was eliminated for Sweden and Finland due to lack of data or insufficient data set. Second, the model included formal gender disaggregated LFPR for age groups 15 to 64 as endogenous variables. The decision to include them in a given equation was based on Granger-causality tests (Granger, 1969) between the endogenous variable in question and the gender disaggregated LFPRS. This study relied on the Granger- causality tests between KAP, FDI, SAV and EM and the four gender disaggregated labor force participation groups (female and male formal age groups (15-65 years; and male and female elderly age groups (65 plus years) performed by Muwanga (2022) for the three countries, USA, Finland and Sweden). Thirdly, the employment variables for the different age groups are gender disaggregated. Employment is decomposed into four major components by age and sex, that is, formal employment for women and men for ages 15 to 64 as well as employment of the elderly female and male, ages 65 and above. These variables were included in the GDP, savings and openness equations to replace the employment (not gender disaggregated) variable usually included in these equations based on theoretical foundations. Fourthly, exchange rate variables were not included in the RGDP model since all three countries in question are developed countries. According to Rodrik (2008), a high real exchange rate (exchange rate undervaluation) stimulates economic growth implying that a low one (exchange rate overvaluation)– deters economic growth, for developing countries but this tends to disappear for richer countries.

The basic macro-models in the system are presented below:

GDP = f(KAP, FEM1564, FEM65, MEM1564, MEM65, FDI, SAV, *exogenous variables*) .. (1)

KAP = f(GDP, OPEN, FDI, SAV, MLFPR1564, FLFPR1564, *exogenous variables*) ………. (2)

FEM1564 = f(GDP, OPEN, FDI, MEM1564, *exogenous variables*) ………………………… (3)

MEM1564 =f(GDP, OPEN, FDI, FEM1564, *exogenous variables*) ………………………….. (4)

OPEN = f(GDP, KAP, FEM1564, MEM1564, *exogenous variables*) ………………………… (5)

FDI-net inflows = f (GDP, OPEN, FEM1564, MEM1564, *exogenous variables*) …………… (6)

SAV = f(GDP, OPEN, FEM1564, MEM1564, *WEALTH*, *exogenous variables*) …………….. (7)

WEALTH = f(GDP, OPEN, SAV, *exogenous variables*) ……………………………………. (8)

FLFPR1564 = f(GDP, KAP, OPEN, FDI, SAV, MLFPR1564, *exogenous variables*) ………. (9)

MLFPR1564 = f(GDP, KAP, OPEN, FDI, SAV, FLFPR1564, *exogenous variables*) ……… (10)

The actual exogenous variables included in each equation for the different countries depended on the availability of data. Human capital development was not included in the system due to lack of sufficient data. The wealth model was only estimated for the USA due to lack of data on wealth for Finland and Sweden. To avoid multi-collinearity due to the high correlation between gender disaggregated formal LFPR and the corresponding gender disaggregated formal employment rates (for example between formal male LFPR and formal male employment rates), the two were not included in the same model. For the GDP, saving and openness models a choice had to be made between using LFPR and employment variables. Whenever the gender disaggregated formal LFPR had a causal relationship with the endogenous variable in question, it was used instead of the corresponding employment variable, otherwise the employment variable was used. For the gender disaggregated formal LFPR models, the gender disaggregated LFPRs for elderly age group was used whenever it had a causal relationship with the former, while the corresponding employment variable was used if and only if it had a causal relationship with the gender disaggregated formal LFPR.

The selection of variables to include in the FLFPR and MLPFR were based on theory as well as existence of causality between specific variable and the FLFPR or the MLFPR. In the instances where there was no causality between either the FLFPR or MLFPR, the corresponding employment variables were considered. The same criterion was used to include either the LFPR or the employment variable for elderly age groups.

All real variables are measured in 2010 prices. Real GDP is gross domestic product, KAP was used as a proxy for capital stock, following various studies that have used investment as a proxy for stocks (Balasubramanyam et al. 1996a, 1996b; Li and Liu 2005; Greenway, Sapsford and Pfaffenzeller, 2007; and Ford, Sen and Wei, 2010). This is due to the lack of data on stocks. FEM1564, MEM1564, *mem65 and fem65* represents gender disaggregated employment for females aged 15-64, males aged 15-64, males aged 65 plus, and females aged 65 plus, respectively and are measured by the employment totals in thousands for different groups. OPEN is an indicator of the openness of the economy and is measured by the sum of real exports and real imports of goods and services. FDI-INFLOW is real foreign direct investment, net inflows. SAV is real savings while wealth is real wealth as measured by M2.

The formal labor force participation (LFPR1564) is calculated as the labor force (aged 15-64 years) divided by the total working -age population (15-64 years). It is measured in percentages. This was disaggregated to obtain the corresponding LFPR for females (FLFPR1564) and for males (MLFPR1564). Similarly, the *flfpr65* and *mlfpr65* represents gender disaggregated labor force participation rates for females and males aged 65 and above, respectively. Although *flfpr65, mlfpr65, mem65 and fem65* could constitute endogenous variable, they are treated as exogenous variables to allow the study to focus on the formal gender disaggregated LFPRs/employment variables.

In all cases, the lagged variables (particularly lagged dependent variables) were only included in situations where the model without such variables was not adequate and if they improved the situation. For example, in Sweden, the best KAP model contained lagged values of female and male LFPRs, which signals that capital formation is influenced by lagged values of the gender disaggregated LFPRS.

The exogenous variables are categorized into four: fiscal policy variables, monetary policy variables, commercial variables and social variables.

Fiscal policy variables

General government spending (*ggexp*) variable, provides an indication of the size of government which can be used to gauge the extent to which the government commits delivering public goods and services and providing social protection and is measured in terms 2010 constant prices.

Health spending which measures the current health expenditure (final consumption of health care goods and services) including personal health care (curative care, rehabilitative care, long-term care, ancillary services and medical goods) and collective services (prevention and public health services as well as health administration), but excluding spending on investments can be financed using three alternative sources. These include government spending and compulsory health expenditure ("Government/compulsory"), voluntary health insurance ("voluntary") and out-of-pocket health expenditure measured in either US$ per capita or in real values per expenditure head. The total health expenditure is the sum of the three health spending financing sources. For this paper, emphasis was put on the Government/compulsory expenditure measured in US dollars per capita using economy-wide PPPs and was captured as *healthcompuls* and out-of-pocket health expenditure (for all persons) measured in real values captured as *roophealthexp*", both converted to logarithms for analysis).

The tax policy variable, (*tax*), is the real total amount of tax revenue collected by government.

Monetary policy variables

There are two *interest* variables: short-term interest rate (*stir)* and the long term interest rate *(ltir)*, which are averages of daily rate, measured as a percentage. Short-term interest rates are the rates at which short-term borrowings are effected between financial institutions or the rate at which short-term government paper is issued or traded in the market. They are usually referred to as "money market rate" and "treasury bill rate". Long-term interest rates on the other hand, refer to government bonds maturing in ten years. Rates are mainly determined by the price charged by the lender, the risk from the borrower and the fall in the capital value; are implied by the prices at which the government bonds are traded on financial markets, not the interest rates at which the loans were issued; and refer to bonds whose capital repayment is guaranteed by governments. Low long-term interest rates encourage investment in new equipment and vice versa. Investment is, in turn, a major source of economic growth.

The financial credit variable *(fc)*, represents domestic credit provided by financial sector measured in constant 2010 prices. The exchange rate variable, (*neer*), is the nominal effective exchange rate which is an unadjusted weighted average rate at which one country's currency exchanges for a basket of multiple foreign currencies**,** measured as the average of daily rates. It is an indicator of a country's international competitiveness in terms of the foreign exchange (forex) market. The inflation variable (*inflation*) is the inflation rate based on the 2010 price index.

Commercial policy variables

The labor/employee compensation variable, *wage*, is measured as the total labor compensation per hour worked (*labcomptotalindex2010*) which is measured in terms of indices.

Social variables

The social variables include: the age dependency ratio (*adr*) which was measured as a percentage of the working age population; land area under agriculture (*al*); electric power consumption (*epc*) measured in kWh per capita; rural population growth (*rpg*) measured as an annual percentage; urban population growth (*upg*) measured as an annual percentage; percentage of total population living in urban areas (*up*); birth rate (*br*) measured as the crude births per 1,000 people; fertility rate (*fr*) measured as the total births per woman; death rate (*dr*) measured as crude number per 1000 people; and the life expectancies of both males (*lemale*) and females (*lefem*), measured in years.

2.2. Data Sources/Variables

The study focused on three developed countries including Finland, Sweden and United States of America (USA), with data on wide range of variables. The data was obtained from various secondary data bases: OECD (2017), OECD Statistics (2018), OECD Statistics- LFS (2017), WDI (2017), and IMF World Data (2017).

2.3. Econometric Specification of the System and Related Diagnostic Statistics

To determine the form in which the system should be estimated, the order of integration for each of the variables was determined using the Im, Pesaran and Shin W-stat (Im, Pesaran and Shin, 2003), the Fisher ADF and Fisher PP (Fisher 1932 and Maddala and Wu (1999). The results of the tests are presented in table 1.

Table 1: Im, Pesaran and Shin W-stat the Fisher ADF and Fisher PP Test Results

Variables stationary at levels	**Variables non-stationary at levels**	**Variables stationary at first difference**	**Variables non-stationary at first difference**	**Variables stationary at the second difference**
USA				
fr, lfpr65+, (all three tests) *ggexp, inflation, up,* and *stir,* (Im, Pesaran and Shin W-stat and the Fisher ADF tests[1]).	All series (all three tests) except those in column 1	All variables (all three tests) except those in column 4	*adr* (all three tests) *up* (Im, Pesaran and Shin W-stat and the Fisher ADF tests[2])	
FINLAND				
FDI, inflation, fr, lefem (all three tests), KAP, MEM1564, labcomptotalindex2010, br (Im, Pesaran and Shin	All series (all three tests) except those in column 1	All variables (all three tests) except	*adr* (all three tests) *up* (Im, Pesaran and Shin W-stat and the Fisher ADF tests[2]) labcomptotalindex2010 (ADF and PP tests[4])	All variables including those in column 4 (all three tests)

W-stat and the ADF tests[1]). Upg (PP test[3])		those in column 4		
SWEDEN				
SAV, GDP, *Inflation*, *X16*, *rpg*, *fr* (all three tests) *up*, *upg* (PP test) adr (Im, Pesaran and Shin W-stat and Fisher ADF[1])	All series (all three tests) except those in column 1	All variables (all three tests) except those in column 4	*adr* (all three tests) *fr* (Im, Pesaran and Shin W-stat and Fisher ADF[2]) *up* (ADF[5])	All variables including those in column 4 (all three tests)

Notes to table: *1. Variables are non-stationary based on PP test. 2. Variables are stationary based on PP test. 3. Variables are non-stationary based on Im, Pesaran and Shin W-stat and ADF tests. 4. Variable is stationary based on Im, Pesaran and Shin W-stat. Variables are stationary based on Im, Pesaran and Shin W-stat and PP tests.*

These results show that all first differences for all variables in the three countries are stationary at least based on one of the three tests except that for *adr* which is not stationary based on all three tests. Consequently, the estimations of the endogenous systems for all three countries were based on the first differences for all the variables since they were all stationary based on at least one of the three tests except age dependency ratio which was used as either the level or the second difference and *up* which could be used as either level, the first difference or the second difference since the Fisher PP test, the Fisher ADF test and the lm, Pesaran and Shin W-stat indicated that it was I(0), I(1) and I(2), respectively. For the other variables which were integrated of order zero (I(0)) but with stationary first differences, the final system adopted was based on goodness of fit of the estimated models and the associated parameters.

For the variables expressed in logarithms for both the dependent and independent variables, their first differences (log-linear model in differences) represent percentage changes, thus elasticities.

For those not expressed in logarithms/differences on both sides of the equation, the interpretation of the coefficient will be based on the inherent functional form.

2.4.Granger-Causality Relationships

The causality relationships presented here are based on the Muwanga (2022) Granger-causality tests and summarized here for quick reference. In the USA, formal female LFPRs and male LFPR are uni-directionally Granger-caused by real GDP while openness Granger-causes formal female LFPR but has a feedback relationship with formal male LFPRs in USA. In Finland, formal FLFPR is uni-directionally Granger- caused by real GDP; formal MLFPRs has a feedback relationship with real GDP while openness Granger-causes formal female LFPR but has no causality with MLFPR. In Sweden, formal FLFPR is uni-directionally Granger- caused by real GDP; formal MLFPR has a feedback relationship with real GDP; openness does not cause either MLFPR or FLFPR and there is no causality between MLFPR of the formal age group and that for the male elderly age group.

In the USA, female LFPRs (15-64 years) has a feedback relationship with the total employment of females; Granger-causes that for the female elder group; is Granger -caused by that for the male group (15-64 years). The formal male (15-64 years) LFPR has bi-directional causality with total employment for the formal female (15-64 years) and elderly (65+) but is Granger-caused by that for the formal and elderly male groups. In Finland, formal female LFPR (15-64 years) Granger causes the total employment of the formal male group; and is Granger caused by that for the formal and elderly female groups as well as that for the elderly male group. The formal male LFPR has a feedback relationship with the total employment for the formal (15-64 years) and elderly (65+) male groups; it Grange-causes that for the formal female (15-64 years) group; and has no causality with that for the elderly female group. In Sweden, formal female LFPR has a feedback relationship with the total employment of formal and elderly female groups as well as that for the middle male group; is Granger-caused by that for the formal male (15-64 years) and the elderly (65+) male groups. The formal male LFPR has bi-directional causality with the total employment for the formal (15-64 years) and elderly female (65+) groups; and is Granger-caused by that for the formal and elderly male groups.

2.5.Estimation of Two Stage Least Squares (TSLS) Model

The USA simultaneous system had 10 endogenous variables while those for Finland and Sweden had 9 since the data for the wealth variable was not available for the two countries. Each of the three systems satisfied the necessary condition for uniquely estimating all the parameters, that requires that the number of endogenous variables in a system is equal to the number of independent equations in the system.

For each country, the instruments used in the system were the pre-determined values (exogenous and lagged variables) appearing in each of the equations in the system and the constant term. The USA model had 29 instruments, Finland had 27 while Sweden had 29 including the constant. The order condition (necessary condition for identification of an equation) which requires that the number of pre-determined (exogenous plus lagged endogenous) variables in the system be greater than or equal to the number of slope coefficients in the equation of interest was satisfied for each of the equations for all the three systems (See Shalabh, nd, *Chapter 17-Econometrics-Simultaneous equation models*, *pp.17-18*). In all cases, the number of pre-determined variables was greater than the number of parameters estimated for each model, implying over-identification. Table 2 summarizes the identification process for each system.

Table 2: Identification Results for the USA, Finland and Sweden Macro Systems

Country	Equations in the system (G)	No. of slope coefficients (SC)	No. of pre-determined variables (K)[1]	Orthogonality conditions[2] K x G)	Satisfaction of identification condition[3] (K x G)≥SC	Conclusion regarding system
USA	10	126	28	280	280>126	Identified
Finland	9	104	26	234	234>104	Identified
Sweden	9	106	28	252	252>106	Identified

***Notes to table:* 1.** *The detailed list of instrumental variables for each country can be obtained from the author by request. 2. The number of pre-determined variables (K) is the same as rank of instruments which excludes the constant). 3. Orthogonality condition is the instrument rank multiplied by number of equations in the system)*

TSLS was able to estimate (sufficient condition) all the equations. This implies that both the necessary and sufficient conditions for parameter estimation are satisfied. Also, it is important to note that TSLS yields consistent estimates of the parameters for exactly identified and over-identified systems (See Shalabh, nd - *Chapter 17-Econometrics-Simultaneous equation models, pp. 28-30*). The zero restrictions imposed on the equations were based either on economic theory and/or having the expected signs of key variables in the model. The system of equations estimated for each country had the general format of:

$$Y_t = K + AY_t + BY_{t-1} + CX_t + DX_{t-1} + \varepsilon \qquad \text{……………………………………………… (11)}$$

where Y_t represents the matrix of endogenous variables, X_t represents the matrix of exogenous variables while Y_{t-1} and X_{t-1} are matrices of lagged endogenous and exogenous variables. The specific format estimated for each equation in the system varied by country as indicated in the results section.

To establish goodness of fit, the coefficient of determination, both R^2 and R^{-2}, were evaluated and the residuals from each of the equations were examined to determine whether they had desirable characteristic by determining whether they are free from autocorrelation (Breusch-Godgfrey Test), heteroskedasticity (Breusch- Pagan Test), Autoregressive Conditional Heteroscedasticity- ARCH (Engel ARCH Test), are normally distributed (Jacque-Bera test) and whether they are stationary (Augmented Dickey Fuller (ADF) test) (See Breusch, 1978; Godfrey, 1978; Breusch and Pagan, 1979; Dickey Fuller, 1979/1981; Jarque and Bera, 1987 and Engel, 1988).

The residuals from the different equations possessed the desired properties at the 1% level of significance, that is, they were free of autocorrelation, heteroscedasticity, ARCH, normally distributed and were stationary at the 1% level of significance, with some exceptions, that is: the

OPEN equation USA was not significant for lag 1 (had ARCH) but was significant for lag 2 (no ARCH); the KAP equation in USA had non-normally distributed residuals; the FDI equation in Finland was not normally distributed; and the OPEN equation in Sweden had heteroscedasticity based on F-test but no heteroscedasticity based on the Chi square test), and did not have a significant test for ARCH-had ARCH.

3.0 RESULTS DISCUSSION

Appendix tables 1, 2 and 3 present the detailed results for the simultaneous system in USA, Finland and Sweden, respectively. Endogenous variables are presented in capital letters, lagged independent variables are presented in capital letters but in italics while exogenous variables are presented in lower case. The coefficients discussed are significant at the 1%, 5% and 10% as conventional levels of significance. The actual level of significance is presented in the respective appendix tables. For some key variables, the coefficient is discussed although it is not significant at the conventional levels, but is significant at a level that lies between 10% and 15% percent, the corresponding level of significance is indicated and the results is presented in italics. Appendix table 4 presents the summary of the signs obtained for the different variables in the equations in the three systems for the USA, Finland and Sweden.

3.1. Discussion of Results for USA

Real GDP in USA had a significant, positive but inelastic response to capital formation, gross government expenditure, financial sector credit and electric power consumption (EPC) with elasticities of 0.1387, 0.1767, 0.0645 and 0.1809, respectively. A one unit (1%) increase in rural population growth resulted into 1.4% (0.014x100 at the 15% level of significance) increase in RGDP (*NB: This is a log-lin functional form thus log* $y = \beta_0 + \beta_1 X$ *whereby* β_1 *x 100 is good estimate of the percentage change in Y due a change in X if the absolute value of* β_1 *is less 0.1 (* $|\beta_1| \prec 0.1$*) otherwise for absolute values of* β_1 *greater than 0.1 (*$|\beta_1| \succ 0.1$*), the percentage change* *in Y following a unit change in X is given by* $\left(e^{\beta_1}-1\right)x100\%$). This implies that the larger the rural population, the higher the RGDP which probably arises out of the increased agricultural production resulting from increased labor input. The elasticity of output to inflation was -0.12 (-0.0012X100), signifying that as inflation increases, output decreases. *The elasticity of output to tax revenues is -0.0304 (at the 15% level of significance).* Taxes crowd – out private investment yet the government does not invest its tax revenues in productive investment in a manner that covers for the loss in private investment. There was no causality between the LFPR (both males and females) with RGDP, thus the two variables were not included in the model. The gender disaggregated formal employment of both females and males have a positive effect on RGDP but only that for males had a significant non-elastic effect on GDP, with an elasticity of 0.4215. No other gender disaggregated variables were included in the model.

Capital formation (KAP) had a significant positive elastic response to GDP (elasticity 1.385), a significant positive but inelastic response to real openness and real savings, with elasticities of 0.211 and 0.6955, respectively. A 1% increase in the short run interest rates led to -0.71% (-0.0071x100) decline in capital formation, implying a significant negative but inelastic effect. Only one gender disaggregated variable was included in the model, that is, LFPR of males of formal age group but it had a negative and non-significant effect.

The employment of the females (15-64 years) had a significant, positive but inelastic response to short term interest rates and lagged LFPR of females (15-64 years), with elasticities of 0.21 (0.0021x100) and 0.87 (0.0087×100), respectively; a significant, positive and elastic response (elasticity of 1.08 = 0.0108×100 at the 13% level of significance) to lagged LFPR of males (15-64 years); and a significant negative elastic response to fertility rates (elasticity of -0.0380×100% =3.8%). These results show that the LFPR of both males and females in a given period lead to an increase in the employment level of females (15-64 years) in the next period. Policies increasing LFPR in general will increase the employment of women in the future. The employment of elderly (65+ years) for both sexes and that for the formal males group (15-64 years) were included in the model but they had non-significant effects on the employment of females (15-64 years).

The employment of males (15-64 years) was significantly influenced by RGDP, employment of females (15-64 years), openness, and the lagged LFPR of females (15-64 years) with elasticities of 0.1692, 0.556, 0.0783) and -0.84 (-0.0084x100), respectively. *It was also significantly influenced by employment of elderly males (65+) but at the 15% level of significance, with an elasticity of -0.0609.* A unit increase (1%) in the rural population growth and urban population growth led to an increase of 2.56% (0.0256x100 = 2.56) and 2.34 (0.0234X100= 2.34) in the employment of males, respectively. This shows that the employment of elderly men reduces the employment of males of 15-64 years while that for females increases it. However, the increase in the LFPR of female formal age group (15-64) reduces their employment in the next period. Population growth whether rural or urban stimulates male employment.

The model for LFPR of females had a combination of lin-log and lin-linear functional forms. A lin-log implies that the dependent variable *Y* increases at a decreasing rate as *X (InX)* variable increases. If the co-efficient of *InX* is greater than 1, it implies that the impact of *X* on *Y* decreases as *X* gets bigger. If the co-efficient is less than 1, then the dependent variable decreases at a decreasing rate.

The co-efficient of R*GDP* (53.9152) is greater than 1, since this is a lin-log function term (LFPR is linear while RGDP is in logs), it implies that the LFPR of females (15-64 years) increases at a decreasing rate as the GDP increases. The co-efficient of 53.9152 implies that 1% increase in RGDP leads to (53.9152 ÷ 100) 0.53 increase in LFPR of females on average. A 1% increase in real capital formation and the real out of pocket health expenditure led to a decline of (-8.353/100 = 0.08353) 0.0835 and 0.0788 (-7.8978/100 = -0.0788) in the LFPR of females (15-64 years) on average, respectively. A unit increase in the labor compensation total index (2010 base) and in the birth rate led to a decrease of 0.2937 and 1.4238 units in the LFPR of females (15-64 years), respectively. A 1% increase in rural population growth reduced the LFPR of females by 1.1552 units. The LFPR males (15-64 years), elderly females (65+), elderly males (65+), adult dependency

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ratio, life expectancy of females, fertility rate and death rate did not have significant effects on the LFPR of females (15-64 years).

A 1% increase in real openness, real savings, and wealth increased the LFPR of males (15-64 years) by 0.03635 (3.6354/100) and (4.9225/100 = 0.04923) 0.04923 units, respectively. *A 1% increase in real openness increased it by 0.01140 (1.1401/100 = 0.01140 but at the 12% level of significance.* A unit increase in the LFPR of female (15-64 years) increased it by 0.2847units while that for the elderly females (65+ years) decreased it by 0.3080. A unit increase in the rural population growth, fertility rate (level) and the birth rate increased it by 0.6972, 1.2058 and 0.3514 units, respectively. *A 1% increase in life expectancy of females (logs) decreased it by 0.5029 (-50.2789/100 but at the 11.5 % level of significance.* An increase in the adult dependency ratio increased (co-efficient of 0.9471 on the 2nd difference) the LFPR of formal male (15-64 years). The LFPR of elderly males (65+ years) was included but it had no significant effect.

Capital formation and inflation had positive and significant effects on openness, with elasticities of 0.9758 and 2.12 (0.0212x100 =2.12), respectively. The nominal effective exchange rate (*nee)r* and financial sector credit (FC) had negative effects on openness, with elasticities of -0.37 (-0.0037x100= -0.37) and -0.3757, respectively. The gender disaggregated employment variables had no significant effects on openness.

The elasticity of RFDI to short term interest rates is 8.36% (0.0836 x 100%). *Its elasticity to financial sector credit is 2.7548 but at the 12.2% level of significance*. Gender disaggregated variables were not included in this model.

The elasticity of real gross savings to real GDP and short-term interest rates were 1. 5023 and 0.59 (0.0059x100 = 0.59), respectively. This implies that real gross savings has an elastic response to RGDP. *The elasticity of real gross savings to long-term interest rates was 0.81 (0.0081X100) but at the 11.9% level of significance.* A 1% increase in inflation (a unit increase) and wealth reduced it by 0.58% (-0.0058x100) and 0.4019%, respectively. Its elasticities to the employment of females (15-64 years), the life expectancy of female and of males were 1.3472, 1.52% and 2.47%, respectively. This implies that increasing the employment of females will increase savings in the economy and that as the life expectancy improves, the people save more for older age although the rate of saving is greater per unit increase in the life expecting of males compared to the unit increase in the life expectancy of females. A unit increase in the fertility rate led to 27.30% ($e^{-0.3189}$ x100 = -27.30%) reduction in the real gross savings.

The wealth model is not discussed since it was associated with R^2 and R^{-2} values. The results are however, presented Appendix table 1b for reference.

3.2. Discussion of Results for Finland

RGDP has: a significant, positive but inelastic response to savings and electric power consumption, with elasticities of 0.1017 and 0.2361, respectively; *a negative response to rural population growth (a unit increase in rpg caused a reduction of 1.68% (-0.0168×100 = 1.68%) in RGDP at the 12% level of significance);* a significant negative response to adult dependency ratio (co-efficient of -0.0297 on the second difference). There was no causality between LFPR of female (15-64 years) and RGDP, thus the variable was not included. The LFPR for male (15-64 years) and the employment of females (15-64 years), elderly (65+ years) males, and females had no significant effect on RGDP. The employment for males (15-64 years) was not included in the model.

Capital formation had a significant positive elastic response to RGDP (elasticity of 1.9933) and significant positive inelastic response to openness and savings, with elasticities of 0.2605 and 0.3332, respectively). The LFPR for male (15-64 years) had a positive but non-significant effect on KAP. No other gender disaggregated variable was included in the model.

The employment of females (15-64 years) had a significant, positive, inelastic response (elasticity of 0.4394) to employment of males (15-64 years) while a unit increase in the lagged LFPR of males and inflation increased it by 0.7% (0.0070×100 = 0.7) and 0.17% (0. 0017×100%), respectively. The higher employment of females following inflation may be a consequence of the increased cost of living which forces women to look for employment to make ends meet at the household level while that following the increase in lagged LFPRs of males may be due to increased income that can be used to pay for some of the unpaid care work provided by females at

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the household level. A unit increase in real FDI inflow increases the employment of females (with a co-efficient of 0.0037 on the log of the level of real FDI. The employment of the elderly females and males, lagged LFPR of females (15-64 years) and fertility rates were included in the model but they all had non-significant effects.

Male employment (15-64 years) was significantly influenced by the employment of females (15-64 years) with elasticities of 0.9813); a unit increase in rural population growth reduced it by 3.18% (-0.0318x100) while a unit increase in inflation decreased it (coefficient of a -0.0033 on the level of inflation).

Openness was only significantly influenced by KAP with an elasticity of 0.5105. The gender disaggregated male and female formal/elderly employment levels had no significant effect on the level of openness.

Real foreign direct investment inflow (RFDI) was entered in logarithm of the levels (not differenced) since it was I(0). An increase in RGDP growth decreased RFDI while an increase in the female employment (15-64) increased it. A unit increase in inflation led to a decrease of 37.11% (($e^{-0.4638}$ -1) x100%) in RGDP. These results show that formal female employment (15-64 years), has a positive effect on real foreign direct investment but RGDP and inflation have a negative effect.

Real gross savings had an elasticity of 2.7557 to RGDP and -0.7142 to compulsory health expenditure per capita; a unit increase in long term interest rates increased it by 3.11% (0.0311x100) while a unit increase in the female LFPRs (15-64 years), elderly female LFPRs (65+) and the birth rate increased it by 2.55% (0.0255x100), decreased it by -2.1% (-0.0210x100) and decreased it by -6.9% (0.069x100), respectively. Employment for females (15-64 years) and that for males (15-64 years), life expectancy of both males and females and the LFPRs of elderly male (65 + years) had no significant effect on real gross savings. These results show that an increase in LFPR of females aged 15-64 increase real gross savings while a corresponding increase for females aged 65+ reduces it. This finding is in line with the life cycle theory (Modigliani and Brumberg,1954) whereby the young save while the elderly de-save. The reduction in saving resulting from an increase in compulsory health expenditure per capita may be explained by the reduced need to save for health spending at the personal level since the institutions meet such costs and/or the need to pay for such expenditure for those who are self- employed.

A 1% increase in real gross savings and in compulsory expenditure in health led to an increase of 0.07887 (7.8871/100) and 0.09649 (9.6488/100) units in the LFPR of the female (15-64 years), respectively. A 1% increase in RGDP decreases it by 0.3978 (-39.7778/100). Also, a unit increase in the adult dependency ratio decreased it (co-efficient of -1.3752 on the second difference of adult dependency ratio) while a unit increase in percentage of total population living in urban areas (*up*) increased it (co-efficient of 7.608 on second difference of the urban population variable). The LFPR of male (15-64 years), elderly male (65+) and females (65+) as well as the life expectancy of males and females, birth rate, death rate, fertility rate did not have significant effects.

A 1% increase in real GDP and out of pocket health expenditure increased the LFPR of male (15-64 years) by 0.1271 (12.7121/100) and 0.03596 (3.596/100 =) 0.3596 units, respectively. A unit increase in LFPRs of female (15-64 years), LFPRs of elderly males and labor compensation index (base year 2010) increased it by 0.4994, 0.2304 and 0.3725 units, respectively. A 1% increase in the life expectancy of males increases it by (76.9273/100 = 0.7693) = 0.7693 units while a unit increase in the fertility rate (level) and lagged LFPR of male (15-64 years) decreased it by 3.7537 and 0.3425 units, respectively. A 1% increase in tax revenue decreases it by (-3.9648/100 = -0.0395) 0.0396 units. An increase in the adult dependency ratio increases it (co-efficient of 0.0882 on second difference). Life expectancy of females did not have a significant effect.

3.3. Discussion of Results for Sweden

RGDP in Sweden had a positive significant inelastic response to savings (elasticity of 0.1705), a significant negative inelastic response to arable land (elasticity of -0.7866). The formal employment of males was not included in the model while that for females (15-64) had a non-significant effect. The employment for elderly (65+) age groups (male and female) also had non-significant effects on RGDP. There was no causality between RGDP and LFPR of formal female age group, thus it was not included in the model while that for the formal male age group had a positive but non-significant effect. *A unit increase in the fertility rate led to -2.45% (-0.0245×100% at the 13% level of significance) change in RGDP*.

Capital formation had a significant positive inelastic response to savings (elasticity of 0.8237). A unit increase LFPR of formal male age group increased by 3.35% (0.0335X100%). Openness RGDP, real foreign direct investment inflow, real tax revenue and long-term interest rates had positive but insignificant effects on capital formation. It had a positive and but insignificant response to openness.

Employment of females (15-64 years) had a significant, positive, inelastic response to compulsory health expenditure (elasticity 0.0844). A unit increase in the LFPR of males (15-64 years), urban population growth and inflation significantly increased it by 1.26% (0.0126×100 = 1.26%), 4.78 (0.0478X100%) and 0.14% (0.0014×100%), respectively. A unit increase in the fertility rate reduced it by 2.34% (-0.0234x100 %). Thus policies that decrease the fertility rate will increase the employment level of females (15-64 years). The employment of the elderly age group for both males and females had non-significant effects on the employment of the females of the formal age group.

Employment of males (15-64 years) was positively and significantly influenced by RGDP and formal employment of females with elasticities of 0.1819 and 0.6313, respectively. *Its elasticity to lagged LFPR of males (15-64 years) was 0.42 but at 15% level of significance* while the current LFPR males (15-64) had no effect. Its elasticity to lagged formal LFPR of females was -0.62. These results show that RGDP, formal female employment, lagged LFPR of males enhance male employment while an increase in lagged LFPR of females leads to decline in male employment.

The elasticities of openness to KAP and the lagged RGDP were 0.5203 and 1.5975, respectively. The current RGDP had no significant effect. This implies that RGDP has no effect on openness in the short-run but it has a positive elastic effect in the long run. A unit increase in the nominal effective exchange rate (NEER) and rural population growth reduced openness by 42.76% (($e^{-0.5579}$ -1) x100= -42.76%) and 60.39% (($e^{-0.926}$ -1) x100 =-60.39%), respectively. These results imply that an increase in the rural population leads to a reduction in the openness of economy probably due to reduction in the demand for imported substitutes of goods demanded at the household level which is not accompanied by an increase in exports. The gender disaggregated formal /elderly employment variables had no significant effect on openness.

The real foreign direct investment inflow had a positive and elastic response to RGDP and RGDP lagged one period (elasticities of 23.8059 and 33.2453, respectively) implying significant effects both in the long run and in the short run. Urban population also had a positive effect, with a co-efficient of 8.3951 on the second difference of the variable. Real openness and financial sector credit had negative elastic effects on RFDI inflow (elasticities of -4.9239 and -2.7522, respectively) while lagged RFDI had a negative inelastic effect (elasticities of -0.5572). A unit increase in NEER reduced it by 11.97% (($e^{-0.1275}$ -1) x 100= -11.97%). No gender disaggregated variables were included in the model**.**

Real gross savings had a significant positive and elastic response to RGDP (elasticity of 3.3319) and a positive but inelastic response to lagged openness (elasticity of 0.2271). *A unit increase in the lagged LFPR of females increased it by 2.06% (0.0206 X100 at the 11.8% level of significance)* while the lagged LFPR of males decreased it by 3.18% (-0.0318×100). The LFPR of females (15-64 years) had a positive but non- significant effect. These results show that the LFPR of females does not have an effect on real gross savings in the short run but it has a positive effect in the long run. On the other hand, the LFPR of males have a negative effect on savings in the long run.

Real gross savings increased by 22.165% (($e^{0.2002}$ -1) x100 = 22.165%) following a unit increase in fertility rates. This finding is contrary to the sign obtained in the USA. This may be due to the nature of child support and or free education programs and policies implemented in the different countries. A unit increase in the birth rate leads to -2.26% (- 0.0226x100%) change in the real gross savings.

A unit increase in the LFPR of males (15-64 years) led to 0.9078 increase in the LFPR of females (15-64). A 1% increase in life expectancy of females increased the LFPR of females (ages 15-64) by 1.8593 (185.9324/100) units. A unit increase in the fertility rate (level) decreased it by 5.0292 units while a unit increase in the birth rate and death rate increased it by 0.5834 and 2.8466 units, respectively. A 1% increase in the employment of elderly females (65+ years) increased it by 0.0109 units (1.0926/100 =0.01093). The adult dependency ratio and employment of elderly males (65+ years) had no significant effect on the LFPR of females (15-64).

A 1% increase in the life expectancy of females increased the LFPR of male (15-64 years) by 0.1067 (10.6725/100 = 0.1067) units while *1% increase in tax revenue decreased it by (-1.9997/100 =-0.019997) 0.02 units but at the 10.56% level of significance.* A unit increase in the LFPR of females (15 -64 years increased it by 0.4673 units while an increase in the urban population decreases it. The employment of elderly male, adult dependency ratio, life expectancy of males, fertility rate, LFPR of elderly females had no significant effect.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

Based on the Granger-causality tests conducted by Muwanga (2022), female LFPR was uni-directionally Granger-caused by real GDP in the three countries, while male LFPR had a feedback relationship with real GDP in Finland and Sweden but was uni-directionally Granger-caused by later in USA. This implies that gender disaggregated labor force participation rates (either for males or females) can have either an endogenous or exogenous relationship with economic growth. This implies that the choice between using a single equation and dynamic system when investigating the relationship between real GDP and LFPR is an empirical question which must be based the causal relationship between the two. For all the three endogenous systems estimated, a stable long-run equilibrium relationship existed for all the equations included in the system, thus the short-run equilibrium relationships can also be estimated.

In the long-run, female LFPR had no causal effect on economic growth in the three countries. An increase in Real GDP increased female LFPR (15-64 years) by 0.5392 in the USA but reduced it by 0.3978 in Finland. Real GDP had a negative but non-significant effect on female FLPRs in Sweden. These results imply that economic growth does not necessarily lead to an increase in female LFPR. Male LFPR in the USA had no causal effect on economic growth but they had a negative but non-significant effect on real GDP in Finland and Sweden. Real GDP had a negative effect on male LFPR in USA and positive effect in Sweden and Finland but was only significant in Finland where a 1% increase in RGDP leads to 0.1271unit increase in male LFPR.

Male LFPRs (15-64 years) had positive effects on female LFPRs (15-64 years) in the three countries but was only significant in Sweden where a unit increase in the male LFPR caused the female LFPR to increase by 0.9078. Female LFPRs (15-64 years), on the other hand, increased the male LFPRs by 0. 287, 0.4994 and 0.4673 in the USA, Finland and Sweden, respectively. These results show that an increase in the LFPR of females (15-64 years) increases the LFPR of males (15-64 years) and vice versa. This implies that for economies that are growing, an increase in the LFPRs of males will not reduce the LFPR of females and vice versa. The growth in either actually enhances growth in the other.

Elderly male LFPRs had a positive effect on both female and male LFPR (15-64 years) in the USA and Finland but only had a significant impact in Finland, where a unit increase caused the male LFPR to increase by 0.2304 units. Elderly female LFPRs had a negative effect on both male and female LFPR (15-64 years) in the USA but was only significant for the male LFPRs where a unit increase in the former caused the later to decrease by -0.308. It had positive but non-significant effects in Sweden. These results imply that the LFPRs of elderly males tends to increase the LFPRs of both male and females (15-64 years) while those for elderly females may have either positive or negative effects.

The endogenous variables which had a significant positive impact on real GDP in at least one of the countries were: real capital formation, employment of males (15-64 years) and real gross savings. The policy variables that had a significant positive effect on GDP in at least one of the three countries were: gross government expenditure, financial sector credit, electricity power consumption and tax revenues. Those that had a significant negative effect were: inflation, adult dependency ratio, arable land and fertility rate. Rural population growth had mixed signs.

The endogenous variables which had a significant positive impact on female LFPRs in at least one of the three countries were: real GDP, real capital formation, real savings, LFPRs of male (15-64). The policy variables that had a significant positive effect on female LFPRs in at least one of the three countries were: life expectancy of females, birth rates, death rates, urban population, employment of elderly females and compulsory health expenditure. Those that had a significant negative effect were: labor compensation total index 2010 (wage variable), rural population growth, adult dependency ratio, fertility rate and out of pocket health expenditure. Rural population growth had mixed signs.

The endogenous variables which had a significant positive impact on male LFPRs in at least one of the three countries were: real GDP, real capital formation, openness, real savings, wealth and LFPRs of female (15-64). The policy variables that had a significant positive effect on male LFPRs in at least one of the three countries were: LFPRs of elderly males, labor compensation total index 2010 (wage variable), adult dependency ratio, out of pocket health expenditure, birth rates and life expectancy of males. Those that had a significant negative effect were: lagged LPFRs of males (15-64 years), tax revenues, urban population. The life expectancy of females, fertility rates had mixed signs. These results show that an increase in the wage variable, out of pocket health expenditure and the adult dependency ratio increased the LFPRs of males (15-64 years) but they decreased the LFPRs of females (15-64 years). Urban population had a positive effect on formal LFPRs of females (15-64 years) but a negative effect on formal LFPRs of males 15-64 years). This implies that the policy variables have gender disaggregated effects on LFPRs. Female LFPRs (15-64 years) had significant positive effects on savings while male LFPRs (15-64 years) had significant positive effects on capital formation.

Appendix tables 4a and 4b summarize the signs for different coefficients obtained in the simultaneous equations for the three countries. With regard to the study hypotheses, the findings revealed that:

i) Endogeneity may exist between economic growth (RGDP) and aggregate/gender disaggregated labor force participation rates, implying a bi-directional causal relationship but this is not always the case.

ii) Policy variables have significant gender disaggregated effects on employment and labor force participation rates. Policy measures for increasing the male LFPR differ from those required for increasing the female LFPR although in some cases the same policy variable can increase both male and female LFPRs. This implies that policy measures needed to increase the employment of females differ from those needed to increase the employment of males with only a few exceptions. Thus, implementing gender neutral policies may yield undesirable gender disaggregated results.

iii) The labor force participation rates and/or employment of women have a significantly different effects on RGDP compared to that of their male counterparts.

iv) Aggregation both of LFPR and employment may obscure key policy interventions required for addressing gender inequalities in the economic empowerment (measured by LFPR).

v) Increasing the female LFPRs has not caused the male LFPRs) to decline due to competition for the jobs on the market, but have in fact increased the male LFPRs.

vi) Stable long-run equilibrium relationships exist for the dynamic systems that include gender disaggregated LFPRs, employment variables on one hand and GDP on the other.

4.2. Recommendations

It is recommended that:

i) Empirical studies investigating the relationship between economic growth and LFPRs should always begin by establishing the causal relationship between the two to signal the appropriate model that should be used for the study.

ii) Policy makers should undertake measures that can ensure that economic growth does not reduce the LFPRs of both females/males. This may be the case if economic growth is derived from capital intensive technologies which lead to loss of jobs.

iii) Policy measures to increase both the male and female LFPRs should be designed and implemented. If this is done, there will be secondary multiplier effects which will increase both categories of LFPRs. The increase in female LFPRs will increase savings while increase in male LFPRs will increase capital formation, both of which will lead to increases in economic growth.

iv) Policy makers should ensure that greater openness attained through various liberalization policies and other measures does not only favor increases in the male LFPRs but that it also caters for the females who may be constrained by the unpaid care work responsibilities and the associated limited mobility of women.

v) Policy makers in different countries attempting to increase LFPRs of both females and males should undertake rigorous macroeconomic dynamic analysis to identify the macroeconomic variables as well as the specific fiscal, monetary, social and commercial variables that have either positive or negative effects on the gender disaggregated LFPRs and to design policies based on the findings.

CONFLICTS OF INTEREST AND PLAGIARISM I declare no conflict of interest and plagiarism.

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APPENDIX TABLES

Appendix Table 1a: TSLS results for the simultaneous system for the USA for the 1973-

2014 period

Independent Variable[1]	**Dependent Variable**					
	D(ULOGRGDP)	**D(ULOGRKAP)**	**D(ULOGEMFEMALE1564)**	**D(ULOGEMMALE1564)**	**D(ULOGROPENNESS)**	**D(ULOGRFDIINFLOW)**
C	**0.0076**** *0.0222*	**-0.0361***** *0.0020*	**0.0808***** *0.0087*	-0.0049 *0.2165*	**0.0722***** *0.0019*	-0.0485 *0.8160*
D(ULOGRGDP)		**1.3825***** *0.0046*	0.1358 *0.2640*	**0.1692!** *0.1421*	-0.9456 *0.4349*	-2.3846 *0.6162*
D(ULOGRKAP)	**0.1387***** *0.0061*				**0.9758***** *0.0049*	
D(ULOGEMFEMALE1564)	0.0243 *0.8365*			**0.5566**** *0.0121*	0.4582 *0.5903*	
D(ULOGEMMALE1564)	**0.4215*** *0.0566*		0.3085 *0.1237*		-0.211 *0.8813*	
D(ULOGROPENNESS)		**0.2111**** *0.0206*	0.0602 *0.2016*	**0.0783*** *0.0736*		1.7751 *0.1898*
D(ULOGRFDIINFLOW)	0.0025 *0.5939*	-0.0044 *0.7733*	-0.0068 *0.1722*	-0.0004 *0.9381*		
D(ULOGRGSAV)	0.0343 *0.4646*	**0.6955***** *0.0001*				
D(ULFPRFEMALES1564)						

D(ULFPRMALES1564)		-0.01 *0.5327*				
D(ULOGEMFEMALE65)	0.0055 *0.8837*		-0.0071 *0.8311*	0.0214 *0.5223*	-0.1844 *0.4377*	
D(ULOGEMMALE65)	0.0476 *0.2702*		0.0321 *0.4193*	**-0.0609!** *0.1458*	-0.1556 *0.5388*	
D(ULFPRFEMALES1564(-1))			**0.0087*** ***0.0077*	**-0.0084**** *0.0135*		
D(ULFPRMALES1564(-1))			**0.0108!** *0.1253*	0.0067 *0.2865*		
D(Uneer)					**-0.0037**** *0.0405*	-0.0052 *0.7129*
*D(U*logrggexp*)*	**0.1767**** *0.0136*					3.0099 *0.4020*
D(Ulabcomptotalindex2010						-0.0521 *0.4753*
D(U*logfc*)	**0.0645**** *0.0105*	-0.0074 *0.9516*			**-0.3757*** *0.0745*	**2.7548!** *0.1220*
D(U*inflation*)	**-0.0012*** *0.0996*		-0.0016 *0.2440*	-0.0010 *0.4860*	**0.0212***** *0.0008*	
D(U*rpg*)	**0.014!** *0.1489*			**0.0256**** *0.0126*		
D(U*up*)				0.0108 *0.3561*		
D(U*upg*)	0.0051 *0.6547*		-0.0084 *0.3743*	**0.0234*** *0.0523*		
D(U*adr*,2)	-0.0074					

	0.2483					
D(U*al*)	-0.0025 *0.6745*					
D(U*logepc*)	**0.1809**** *0.0232*					
U*fr*			**-0.0380***** *0.0098*			
D(U*logtax*)	**-0.0304!** *0.1500*	0.0332 *0.6175*				1.0205 *0.3658*
D(U*ltir*)		-0.0004 *0.9377*			-0.0126 *0.2400*	
D(U*stir*)		**-0.0071*** *0.0698*	**0.0021**** *0.0216*	0.0011 *0.2255*	0.0028 *0.6855*	**0.0836**** *0.0338*
D(U*loghealth compuls*)			-0.0002 *0.9885*			
D(ULOGWEALTH)						
R-squared	0.968	0.942	0.915	0.921	0.846	0.526
Adjusted R-squared	0.947	0.925	0.876	0.885	0.789	0.411
S.E. of regression	0.0047	0.0203	0.006076	0.005719	0.040583	0.344121

Notes to table: 1. The results are based on the 1973 to 2014 data, number of included observations after adjustment is 42 (n = 42). The instrumental rank is 28.

Appendix Table 1b: TSLS results for the simultaneous system for the USA for the 1973-2014 period continued.

Independent Variable[1]	Dependent Variable			
	D(ULOGRGSAV)	**D(ULFPRFEMALES1564)**	**D(ULFPRFEMALES1564)**	**D(ULOGWEALTH)**
C	**-6.6686**** *0.0162*	0.2098 *0.5722*	**-2.4320***** *0.0098*	0.0139 *0.2159*
D(ULOGRGDP)	**1.5023***** *0.0045*	**53.9152***** *0.0003*	-7.0762 *0.2917*	0.6876 *0.2373*
D(ULOGRKAP)		**-8.3527*** *0.0675*		
D(ULOGEMFEMALED1564)	**1.3472*** *0.0644*			
D(ULOGEMMALE1564)	0.7643 *0.4540*			
D(ULOGROPENNESS)		-0.3060 *0.8145*	**1.1401!** *0.1190*	0.0046 *0.9701*
D(ULOGRFDIINFLOW)			-0.1846 *0.1974*	
D(ULOGRGSAV)		-4.8437 *0.2879*	**3.6354*** *0.0867*	-0.2475 *0.1956*
D(ULOGWEALTH)	**-0.4019**** *0.0180*		**4.9225**** *0.0495*	
D(ULFPRFEMALES1564)			**0.2847**** *0.0152*	
D(ULFPRMALES1564)		0.4692 *0.3983*		
D(*Ulogemfemale65*)	-0.0166 *0.8748*			
D(*Ulogemmale65*)	-0.1672			

	0.2754			
D(*ULFPRFEMALES 1564(-1))*				
D(*ULFPRMALES1564(-1))*				
D(U*lfprfemales65*)		-0.4557 *0.2659*	**-0.3080**** *0.0385*	
D(U*lfprmales65*)		0.1540 *0.4687*	0.0461 *0.5624*	
D(U*neer*)				
D(U*logrggexp*)	-0.3638 *0.1834*			
D(U*labcomptotalindex2010*)		**-0.2937**** *0.0153*	-0.064 *0.3438*	
D(U*logfc*)	0.1376 *0.1984*			0.1656 *0.2262*
D(U*inflation*)	**-0.0058**** *0.0309*			-0.0066 *0.1619*
D(U*rpg*)		**-1.1552**** *0.0472*	**0.6972*** *0.0916*	**0.0590*** *0.0744*
D(U*up*)				
D(U*upg*)			**0.9471*** *0.0603*	
D(U*adr*,2)		0.3096 *0.5756*		
D(U*al*)		0.6799 *0.1513*		
D(U*logepc*)				
U*loglefem*	**1.5179**** *0.0164*	40.3394 *0.5190*	**-50.2789!** *0.1153*	

D(U*loglemale*)	**2.4724*** *0.0894*	61.214 *0.2441*	11.4548 *0.6860*	
U*fr*	**-0.3189***** *0.0030*	-7.1565 *0.1778*	**1.2058**** *0.0148*	
D(U*logtax*)	-0.0082 *0.8964*			
D(U*ltir*)	**0.0081!** *0.1193*			
D(U*stir*)	**0.0059*** *0.0702*			**0.0070*** *0.0938*
D(U*loghealthcompuls*)		-0.6725 *0.4701*		
D(U*logroophealthexp*)		**-7.8978*** *0.0588*	-0.2016 *0.9413*	
D(U*br*)		**1.4238*** *0.0578*	**0.3514**** *0.0242*	
D(U*dr*)		0.922 *0.2792*		
R-squared	0.945907	0.797901	0.788718	0.331893
Adjusted R-squared	0.914699	0.639736	0.653498	0.194342
S.E. of regression	0.017419	0.383745	0.189918	0.027299

Notes to table: 1. The results are based on the 1973 to 2014 data, number of included observations after adjustment is 42 (n = 42). The instrumental rank is 28.

Appendix Table 2a: TSLS results for the simultaneous system for the Finland for the 1976-2014 period

Independent Variable[1]	Dependent Variable				
	D(FLOGRGDP)	**D(FLOGKAP)**	**D(FLOGEMFEMALE1564)**	**D(FLOGEMMALE1564)**	**D(FLOGROPENNESS)**
C	0.0283	-0.1046	-0.0194	0.088	0.0195

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	0.4845	*0.2016*	*0.8122*	*0.1944*	*0.4356*
D(FLOGRGDP)		**1.9983*** ** *0.0028*	0.1707 *0.3668*	0.0104 *0.9670*	0.9023 *0.3521*
D(FLOGKAP)	0.057594 *0.1662*				**0.5105*** *0.0813*
D(FLOGEMFEMALE1564)	0.0392 *0.8379*			**0.9813***** *0.0076*	-1.5172 *0.1513*
D(FLOGEMMALE1564)			**0.4394**** *0.0109*		0.4568 *0.6864*
D(FLOGROPENNESS)		**0.2605*** *0.0903*	-0.0262 *0.6012*	0.0252 *0.6828*	
FLOGRFDIINFLOW	-0.0006 *0.7431*	0.0027 *0.4807*	**0.0037*** *0.0738*	-0.0035 *0.2199*	
D(FLOGRGSAV)	**0.1017***** *0.0203*	**0.3332*** *0.0691*			
D(FLFPRMALES1564)	0.0031 *0.2868*	0.0032 *0.8240*			
D(*FLFPRFEMALES1564(-1)*)			0.0002 *0.9579*	0.0009 *0.8579*	
D(*FLFPRMALES1564(-1)*)			**0.0070*** 0.0650	-0.0063 *0.1987*	
D(*Flogemfemale65*)	-0.0031 *0.7873*		0.0121 *0.3862*	-0.0114 *0.4871*	0.0655 *0.3606*
D(*Flogemmale65*)	0.0087 *0.5828*		-0.0095 *0.6594*	0.0087 *0.7397*	-0.0387 *0.7587*
Finflation	**-0.0022**** 0.0169		**0.0017*** *0.0966*	**-0.0033**** *0.0218*	-0.0011 *0.7570*
D(*Flogtax*)		-0.1322 *0.2952*			

D(F*ltir*)		-0.0029 *0.7552*			0.0021 *0.8819*
D(F*stir*)		0.0053 *0.3426*	0.0007 *0.6374*	0.0034 *0.0837*	0.005 *0.5347*
D(F*neer*)					-0.0075 *0.0211*
D(F*rpg*)	**-0.0168!** *0.1119*			**-0.0318*** *0.0816*	
D(F*upg*)	0.0038 *0.8649*			0.0018 *0.9615*	
F*fr*			-0.0387 *0.3332*		
D(F*adr,2*)	**-0.0297**** *0.0208*				
D(F*logepc*)	**0.2361***** *0.0003*				
D(F*loghealthcompuls*)	**0.1627**** *0.0111*				
R-squared	0.931886	0.822743	0.826303	0.832683	0.739200
Adjusted R-squared	0.889720	0.768202	0.743231	0.741419	0.646058
S.E. of regression	0.007587	0.041426	0.010983	0.012494	0.054014

Notes to table: 1. The results are based on the 1976 to 2014 data, number of included observations after adjustment due to presence of lagged and differenced instrumental variables is 35 (n = 35). The instrumental rank is 26.

Appendix Table 2b: TSLS results for the simultaneous system for the Finland for the 1976-2014 period continued

Independent Variable[1]	**Dependent Variable**			
	FLOGRFDIINFLOW	**D(FLOGRGSAV)**	**D(FLFPRFEMALES1564)**	**D(FLFPRMALES1564)**

C	**23.9191***** *0.0000*	-0.6135 *0.6654*	4.9933 *0.2288*	39.8935 *0.1711*
D(FLOGRGDP)	**-45.4259**** *0.0460*	**2.7557***** *0.0000*	**-39.7778**** *0.0265*	**12.7121**** *0.0322*
D(FLOGKAP)			2.0372 *0.6477*	
D(FLOGEMFEMALE1564)	**52.1542*** *0.0582*			
D(FLOGEMMALE1564)				
D(FLOGROPENNESS)	4.9968 *0.4684*	0.1110 *0.3250*		
FLOGRFDIINFLOW				0.0251 *0.7510*
D(FLOGRGSAV)			**7.8871*** *0.0570*	-1.0887 *0.5603*
D(FLFPRFEMALES1564)		**0.0255*** *0.0650*		**0.4994***** *0.0031*
D(FLFPRMALES1564)	0.1527 *0.7937*	-0.0185 *0.1711*	0.4198 *0.1762*	
D(*FLFPRMALES1564(-1)*)				**-0.3425***** *0.0063*
D(F*lfprfemales65*)		**-0.0210**** *0.0459*		
D(F*lfprmales65*)		-0.0003 *0.9637*	0.0450 *0.6808*	**0.2304***** *0.0051*
D(F*logemfemale65*)				
D(F*logemmale65*)				
D(F*labcomptotalindex2010*)	-0.0241 *0.9447*		-0.1312 *0.4914*	**0.3725***** *0.0008*

Finflation	**-0.4638*** *0.0000*			
D(F*logtax*)	3.1170 *0.5087*			**-3.9648**** *0.0131*
D(F*ltir*)		**0.0311***** *0.0008*		
D(F*stir*)	0.0681 *0.7343*			
D(F*neer*)	-0.0315 *0.6978*			
D(F*up*,2)			**7.608**** *0.0193*	1.6046 *0.5238*
F*fr*			-2.3859 *0.3157*	**-3.7537*** *0.0723*
F*loglefem*		0.1356 *0.6739*	-6.7709 *0.9336*	-9.5910 *0.1676*
D(F*loglemale*)		2.1512 *0.3028*	-8.8207 *0.9063*	**76.9273**** *0.0222*
D(F*adr*,2)			**-1.3752*** *0.0621*	**0.8882*** *0.1004*
D(F*al*)			1.7163 *0.2387*	
D(F*dr*)			0.633 *0.6872*	
D(F*br*)		**-0.069**** *0.0134*	-0.0599 *0.8892*	
D(F*loghealthcompuls*) (US$ per capita)		**-0.7142***** *0.0000*	**9.6488**** *0.0133*	
D(F*logroophealthexp*)			4.0536 *0.3937*	**3.596*** *0.0665*

R-squared	0.632975	0.923469	0.613541	0.820328
Adjusted R-squared	0.500846	0.892290	0.332480	0.694558
S.E. of regression	1.500892	0.031655	0.604041	0.373754

Notes to table: 1. The results are based on the 1976 to 2014 data, number of included observations after adjustment due to presence of lagged and differenced instrumental variables is 35 (n = 35). The instrumental rank is 26.

Appendix Table 3a: TSLS results for the simultaneous system for Sweden 1973 to 2013 period

Independent Variable[1]	**Dependent Variable**				
	D(SLOGRGDP) 1973-2013	D(SLOGKAP)	D(SLOGEMFEMALE1564)	D(SLOGEMMALE1564)	D(SLOGROPEN)
C	0.0773 *0.4872*	-0.0087 *0.6275*	**0.0364!** *0.1274*	0.0002 *0.9518*	-0.0314 *0.2197*
D(SLOGRGDP)		0.3196 *0.7292*	0.1322 *0.2494*	**0.1819**** *0.0418*	0.8259 *0.3743*
D(SLOGKAP)	0.0566 *0.3139*				**0.5203**** *0.0418*
D(SLOGEMFEMALE1564)	0.0613 *0.7598*			**0.6313***** *0.0005*	-0.6225 *0.6574*
D(SLOGEMMALE1564)					1.1807 *0.4886*
D(SLOGROPENNESS)		0.1716 *0.1648*	-0.0026 *0.9258*	0.0055 *0.7912*	
D(SLOGRFDIINFLOW)	-0.0008 *0.7132*	0.0035 *0.6438*	0.0006 *0.7407*	0.0002 *0.8920*	
D(SLOGRGSAV)	**0.1705**** *0.0198*	**0.8237***** *0.0047*			
D(SLFPRMALES1564)	0.0048 *0.4927*	**0.0335*** *0.0815*	**0.0126***** *0.0087*		

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D(SLOGEMFEMALE65)	-0.0120 *0.2845*		-0.0006 *0.9393*	0.0071 *0.2581*	0.0036 *0.9348*
D(SLOGEMMALE65)	0.0199 *0.3312*		-0.0030 *0.8704*	-0.0013 *0.9283*	-0.0155 *0.8704*
D(*SLOGRGDP(-1)*)					**1.5975**** (2.5744) *0.0161*
D(*SLOGROPENNESS(-1)*)					**-0.5579***** (-4.1315) *0.0003*
D(*SLFPRFEMALES1564(-1)*)		-0.0001 *0.9903*	0.0013 *0.6980*	**-0.0062**** *0.0172*	
D(*SLFPRMALES1564(-1)*)		0.0124 *0.4198*	-0.0009 *0.8222*	**0.0042!** *0.1166*	
Sinflation			**0.0014**** *0.0382*	-0.0006 *0.1976*	0.0022 *0.5382*
D(*Slogal*)	**-0.7866*** *0.0826*				
Sfr	**-0.0245!** *0.1287*		**-0.0234*** *0.0784*		
D(*Slogtax*)	0.0183 *0.5279*	0.0159 *0.8865*			-0.0085 *0.9445*
D(*Sltir*)		0.0033 *0.6824*			
D(*Slogfc*)					-0.0454 *0.5100*
D(*Sneer*)					**-0.0077***** *0.0014*
D(*Slogepc*)	0.0114 *0.8611*				

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Sadr	-0.0004 *0.8137*				
Srpg				0.0040 *0.2491*	**-0.0926***** *0.0006*
D(*Sup,2*)				-0.0399 *0.4849*	
D(*Supg*)	-0.019 *0.3707*		**0.0478***** *0.0028*	0.0026 *0.8645*	
D(*Sloghealthcompuls*)			**0.0844**** *0.0217*		
R-squared	0.837388	0.815299	0.699168	0.813250	0.786661
Adjusted R-squared	0.749307	0.755931	0.554768	0.723610	0.679991
S.E. of regression	0.010431	0.043663	0.009218	0.006685	0.049876

Notes to table: 1. The results are based on the 1973 to 2013 data, number of included observations after adjustment due to presence of lagged and differenced instrumental variables is 38 (n = 38). The instrumental rank is 28.

Appendix Table 3b: TSLS results for the simultaneous system for Sweden for the 1973 to 2013 period continued

Independent Variable[1]	**Dependent Variable**			
	D(SLOGRFDIINFLOW)	**D(SLOGRGSAV)**	**D(SLFPRFEMALES1564)**	**D(SLFPRMALES1564)**
C	-0.9673 *0.0040*	**-0.1486**** *0.0475*	3.9399 *0.5338*	**-45.1016**** *0.0425*
D(SLOGRGDP)	**23.8059*** *0.0564*	**3.3319***** *0.0000*	-11.8081 *0.4721*	1.6304 *0.8478*
D(SLOGKAP)			4.5790 *0.2515*	2.7121 *0.1707*
D(SLOGROPENNESS)	**-4.9239*** *0.0582*			

D(SLOGRGSAV)			-5.5721 *0.2988*	
D(SLFPRFEMALE S1564)		-0.0172 *0.2097*		**0.4673***** *0.0045*
D(SLFPRMALES1 564)		0.0091 *0.6284*	**0.9078**** *0.0145*	
D(*Slogemfemale65*)		-0.0059 *0.8259*	**1.0926*** *0.0990*	
D(*Slogemmale65*)		-0.0628 *0.3215*	-0.0166 *0.9902*	0.1264 *0.8845*
D(*SLOGRGDP(-1)*)	**33.2453***** *0.0015*			
D(*SLOGROPENNE SS(-1)*)	1.1663 *0.5690*	**0.2271***** *0.0027*		
D(*SLOGRFDIINFL OW(-1)*)	**-0.5572***** *0.0001*			
D(*SLFPRFEMALE S1564(-1)*)		**0.0206!** *0.1178*		
D(*Slfprmales1564(-1)*)		**-0.0318**** *0.0175*		
D(*Slfprfemales65*)				0.01953 *0.8005*
Sbr		**-0.0226!** *0.1105*	**0.5834*** *0.0770*	
Sfr		**0.2002*** *0.0629*	**-5.0292**** *0.0372*	0.2354 *0.6656*
D(*Sloglefem*)			**185.9324*** *0.0548*	**10.6725**** *0.0253*
D(*Sloglemale*)				1.2488 *0.9754*

D(*Slogtax*)	-1.1624 *0.5774*		1.7332 *0.4340*	**-1.9997!** *0.1056*
D(*Sltir*)	-0.1182 *0.3643*			
D(*Slogfc*)	**-2.7522***** *0.0096*			
D(*Sneer*)	**-0.1275***** *0.0010*			
Sadr			-0.0258 *0.8084*	-0.0442 *0.4666*
D(*Sal*)			1.7221 *0.3528*	
D(*Sdr*)			**2.8466**** *0.0265*	
Srpg				
D(*Sup,2*)	**8.3951**** *0.0429*	-0.0155 *0.9398*	1.3256 *0.7973*	**-5.0403*** *0.0790*
D(*Sloghealthcompuls*)				-1.8958 *0.1644*
R-squared	0.657285	0.883110	0.664418	0.690115
Adjusted R-squared	0.530354	0.837189	0.476493	0.552388
S.E. of regression	0.751061	0.030017	0.660779	0.424596

Notes to table: 1. The results are based on the 1973 to 2013 data, number of included observations after adjustment due to presence of lagged and differenced instrumental variables is 38 (n = 38). The instrumental rank is 28.

Appendix Table 4a: Summary of signs obtained in the simultaneous system equations estimated for

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the three countries -USA, Finland and Sweden.

Dependent Variable:	**D(ULOGRGDP)**	**D(ULOGRKAP)**	**D(ULOGEMFEMALE1564)**	**D(ULOGEMMALE1564)**	**D(ULOGROPENNESS)**	**D(ULOGRFDIINFLOW)**
D(LOGRGDP)		+	+	+	+/-	+/-
D(LOGRKAP)	+				+	
D(LOGEMFEMALE1564)	+			+	+/-	+
D(LOGEMMALE1564)	+		+		+/-	
D(LOGROPENNESS)		+	+/-	+		+/-
D(LOGRFDIINFLOW)	+/-	+/-	+/-	+/-		
D(LOGRGSAV)	+	+				
D(LFPRFEMALES1564)						+
D(LFPRMALES1564)	+	+/-	+			
D(*logemfemale65*)	-		+/-	+/-	+/-	
D(*logemmale65*)	+		+/-	+/-	-	
D(*LFPRFEMALES1564(-1)*)		-	+	+/-		
D(*LFPRMALES1564(-1)*)		-	+/-	+/-		
D(neer)					-	-
D(logrggexp)	+					+
D(*labcomptotalindex2010*)						-
D(*logfc*)	+	-			-	+/-
D(*inflation*)	-		+/-	-	+/-	-
D(*rpg*)	+/-			+/-	-	
D(*up*)				+		
D(*up,2*)				-		+

D(*upg*)	+		+/-	+		
D(*adr,2*)	-					
D(*al*)	-		+			
D(*logepc*)	+					
fr	-		-			
D(*logtax*)	+/-	+/-			-	+/-
D(*ltir*)		+/-			+/-	-
D(*stir*)		+/-	+	+	+	+
D(*loghealthcompuls*)			+/-			
D(LOGWEALTH)						
D(*LOGRGDP (-1)*)					+	+
D(*LOGROPENNESS(-1)*)					-	+
D(*LOGRFDIINFLOW(-1)*)						-

Appendix Table 4b: Summary of signs obtained in the simultaneous system equations estimated for the three countries -USA, Finland and Sweden

Dependent Variable:	**D(ULOGRGSAV)**	**D(ULFPRFEMALES1564)**	**D(ULFPRMALES1564)**	**D(ULOGWEALTH)**
C				
D(LOGRGDP)	+	+/-	+/-	+
D(LOGRKAP)		+/-	+	
D(LOGEMFEMALE1564)	+/-			
D(LOGEMMALE1564)	+			
D(LOGROPENNESS)	+	-	+	+
D(LOGRFDIINFLOW)			+/-	
D(LOGRGSAV)		+/-	+/-	-
D(LOGWEALTH)	-		+	
D(LFPRFEMALE1564)	+		+	

D(LFPRMALES1564)	-	+		
D(*logemfemale65*)	-	+		
D(*logemmale65*)	-	+	+	
D(*LFPRFEMALE1564(-1)*)	+			
D(*LFPRMALES1564(-1)*)	-		-	
D(*lfprfemales65*)	-	-	+/-	
D(*lfprmales65*)	-	+	+	
D(*neer*)				
D(*logrggexp*)	-			
D(*labcomptotalindex2010*		-	+/-	
D(*logfc*)	+			+
D(*inflation*)	-			-
D(*rpg*)		-	+	+
D(*up*)				
D(*up,2*)	-	+	+/-	
D(*upg*)				
adr		-	-	
D(*adr,2*)		+/-	+	
D(*al*)		+		
D(*logepc*)				
loglefem	+	+/-	+/-	
D(*loglemale*)	+	-	+	
fr	+/-	-	+/-	
D(*logtax*)	-	+	-	
D(*ltir*)	+			
D(*stir*)	+			+
D(*loghealthcompuls*)	+	+/-	-	
D(logroophealthexp)		+/-	+/-	
D(*br*)	-	+/-	+	
D(*dr*)		+		

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D(*LOGRGDP (-1*))				
D(*LOGROPENNESS(-1*))	+			
D(*LOGRFDIINFLOW(-1*))				