Journal of Economic Sciences
Volume 5, Issue 1
https://www.jesciences.com

Valuing Household Work and Well-being in Pakistan: A Gender-Based Time-Use Analysis

Hamna Nasir[1, *], Ambreen Fatima[1], Gulrukh Zahid[1]

Affiliations

Applied Economics Research Center, University of Karachi

*Corresponding Author Email:

hamnainfinite@gmail.com

Timeline
Received: Dec 01, 2025
Revised: Jan 21, 2026
Accepted: Jan 31, 2026
Published: Feb 02, 2026

DOI
https://doi.org/10.55603/jes.v5i1.a1

Abstract
This study explores the well-being of individuals involved in household work and expenditure-saving market work by employing a time-use dimension. Further, the share of household work and expenditure-saving market work in GDP is estimated at the macro level and by gender. Data of this study is collected from Labour Force Survey of Pakistan for the period 1994, 2001, 2007, 2014 and 2018. Well- Being index is constructed by using the study of Floro and Pichetpongsa (2010) and Kaur and Uppal (2015). The results of this study reveal that men's well-being index is higher than women's, due to their lower work intensity and higher education attainment. Moreover, the well-being index of urban women is higher than that of rural women, as they are involved in household and market work to save on expenditure; hence, an uneven burden on them leads to a stressful life. Further, they are deprived of educational opportunities. The share of household work would increase from 31% to 43.35% for the period 1994-2017 if included in GDP, and women's share would be higher, as they shoulder household responsibilities. The share of expenditure-saving market work has declined from 23.08% to 9.14% for the period 1994-2017 when included in GDP. Based on these findings, this research will contribute to increasing understanding among policymakers and researchers of the economic contributions made by women through their household and expenditure-saving market work.

Keywords: *Well-being Index, Household Work, Inverse Work Intensity*

JEL Classification: *I31, P24, D13, J22, J6*

1. Introduction

Globally, women perform most household tasks, including household maintenance and childcare, whether employed full-time or part-time. A general assessment on housework across the globe is that it is "undervalued, underpaid, unprotected and poorly regulated" and it is "unrecognised" despite the contributions made, especially by women, Pakistan being no exception. The factors that draw women out of the labour market are numerous (such as the two-tier labour market, wage discrimination, the glass ceiling, etc.), and household work is one of them. Women, whether engaged in household work or in expenditure-saving market work, have higher household hours than their male counterparts. Hence, their workload is higher than men's. Frances and Russel (2005) found that the average working hours/day are longer for women than for men.

Hence, this study focuses on the well-being of individuals involved in household work and in expenditure-saving market work, which represent a growing segment of the working population and are likely to be both "time-poor" and "money-poor". Using GIS, indicators of well-being and well-being index are constructed by gender and province and are presented in Figures 1 and 2.

Figure 1 presents the well-being index and its sub-indicators for unpaid contributing family workers. The education attainment index for unpaid family workers shows a mixed trend across provinces:

it is higher for males in KPK and for females in Punjab and Sindh. An increasing trend in the household income index is observed for both genders, with higher levels for males and females in Balochistan. The male inverse work intensity index has decreased in all provinces except KPK, where a mixed trend is observed, while the female inverse work intensity index has increased in all provinces except Balochistan. The inverse work intensity index (IWI) is higher for males of Punjab and lower for males of KPK, while for females, it is higher in all provinces except Balochistan. The well-being index has increased for males in KPK and Sindh and declined in other provinces, while for females, it has increased in all provinces except Balochistan. The well-being index is higher in Punjab for both males and females, while it is lower for males in KPK and for females in KPK and Balochistan. (Figure A-1)

Figure 2 presents the well-being index and its sub-indicators for individuals involved in household work. A mixed trend is observed in the education attainment index for both males and females, with higher values for males in Balochistan and for females in Punjab and Sindh. A mixed/increasing trend in the household income index has been observed in some provinces for males, and a decreasing trend for females, while it is higher for males in Balochistan and for females in KPK. The inverse work intensity index shows an increasing trend for both males and females. It is higher for males of Punjab and females of Sindh, while it is lower for males of KPK and females of Punjab. Well-being indices for males and females have accelerated in KPK and Punjab, and declined for both genders in Sindh and Balochistan, while they are higher for males of Punjab and for females of Punjab and Sindh. The well-being index and its indicators are higher for males (whether they are involved in household work, market work, or both) due to their lower work intensity index and higher education attainment index. (Figure A-2)

Currently, household production is excluded from Pakistan's national accounts, so the national accounts fail to measure the welfare of the economicy inactively accurately. Goods and services which household members produce for their own consumption by combining their unpaid labour and the goods and services which are procured from the market. Conventional macroeconomic aggregates exclude the value added generated by these activities. Household production seems to be worthless in national accounts, but it consumes time (increases the time devoted to household work), increases the value of purchased goods and services; therefore, its economic value seems substantial. On the other hand, expenditure-saving market work when performed by unpaid family workers is unrecognised and not counted in national accounts, but the time devoted to these activities has economic value. Therefore, these activities should be recognised and included in GDP.

The economic value of individuals involved in household work and expenditure-saving market work, especially women's work, is unrecognised by the Government, and their labour is excluded from GDP; therefore, they are considered a burden or an expense rather than a significant contributor to the national economy. Researchers, economists, and policymakers have neglected this issue; hence, it is highlighted in this study. The well-being index and its determinants are assessed for individuals involved in the above-mentioned activities by gender. Further, the share of these activities is also estimated in GDP at the macro level and by gender. Well-being indices for individuals involved in household work and expenditure-saving market work, and the share of these activities in GDP, have not been estimated by national researchers, and this is the main contribution of this study.

This paper is organised as follows: Section 2 contains a brief literature review on Well-being and the share of household work in GDP; Section 3 contains the methodology and data sources; and Sections 4 and 5 discuss the model specification and estimation technique. In section 6, the results are discussed and further divided into three parts. In the first part, the well-being index of individuals involved in household work and expenditure-saving market work is analysed; in the second part, the determinants of the well-being index are discussed; and in the last part, the share of household work and expenditure-saving market work in GDP is discussed in detail. The last section contains the conclusion and policy implications.

2. Literature Review

Most international researchers have highlighted the share of household work in GDP, but there is limited research on this topic in Pakistan. On the other hand, the well-being index is estimated by researchers of developing countries, but no national studies are available on this issue.

In the past years, economists have argued that by ignoring income and wealth which is generated by housework introduces a bias in different areas of economic analysis and it has been pointed out by the researchers that "In-kind income" significantly underestimates the productive household activities by not taking GDP into account (Mitchell et a/. 1921, Kuznets 1944, and Clark 1958). The study by Nordhaus and Tobin (1972) contends that household members' production contributes to the economic welfare of household services; as a result, it is not adequately measured by conventional GNP. Zick and Bryant (1985) found that inequalities in income distribution decrease when household production is added to household income, and their findings also have social and welfare policy implications.

Arshad (2008) estimated the national economic contribution of domestic work by Pakistani women at $25.35 billion/year. She concluded that, as women are held responsible for providing basic and essential goods and services, it should be valued at a higher rate than unnecessary or harmful activities, as the housework represents an important part of society, i.e. care of home and family, therefore it should be traditionally included in GDP. In 1997, by including housework in GDP, the estimates of the US ranged to 24% of GDP and for the same year, the GDP of Switzerland ranged between 27% to 39%, whereas by using time diary data of Australia, Bulgaria, Denmark, Finland, France, Germany, and Norway, the estimates of similar magnitude were obtained. (Poza, Schmid, and Widmer 2001, Clermont and Aligisakis 1999). Based on these substantial estimates, it is notable that the home production sector has shrunk. Landefeld and McCulla (2000) argue that housework would contribute substantially to national GDP if it were included in national accounts substantially.

To define well-being, Nussbaum (2000, 2003) argues that a good starting point is a conception of life worthy of dignity. This life contains "a truly human functioning" (2000: 39). Health, adequate working conditions, and emotional well-being are the social basis of a dignified life, and, at the individual level, this approach calls for examining people's beings and doings in market and non-market settings. (Nussbaum 2000). Kucera and Roncolato (2008) incorporate a time-use dimension to measure the well-being of poor employees, especially those engaged in the informal economy. Individuals earn to fulfil their basic needs and to meet the demands of housework (domestic and care work), which leads many individuals, specifically females, to work long hours and engage in multitasking. Higher income is earned through increased working hours, and household chores are completed by performing overlapping activities, leading to an increase in time allocation, specifically for informal women, and a decline in time for their leisure and personal care, which deteriorates their health. It is also analysed from the report of UNDP (1995) that time use surveys reveal that although women's participation in labor force is lower than men as they spend more time on work (market work and household work) and less time on leisure which is due to the women contribution in family-owned farms and enterprises, their family responsibilities, reproductive roles, etc.

The studies presented by United Nation Development Programme (UNDP) such as Human Development Index (HDI) and Gender-related Development Index (GDI) have incorporated indicators of health and literacy for estimation by using Sen's (2000, 2003) capabilities approach. Present studies have highlighted that these indexes should be revised as they do not incorporate well-being and its components. Further, Folbre (2008) also argues that GDI does not focus on the participation of care economy. It was suggested by Dijikstra and Hammer (2000) that to assess inequalities in capabilities alternative gender inequality should be measured. The Index of Social Well-Being (SWB) and the Levy Institute Measure of Well-Being (LIMEW) are the indices which include the quality of life but they only highlight the well-being of countries, not individuals. (Wolff and Zacharias 2003). A procedural approach was provided by Robeyns (2003) that generates a list of valuable capabilities in the context of Western societies by using Sen's capabilities approach. Time allocation, leisure time, and time-related stress that imperil women's

capabilities and real opportunities were taken into account by her for estimating gender inequalities. Person's capabilities which include women's mental and physical well-being, time for leisure and for nurturing social relations, as well as her time autonomy and the quality of time spent on an activity are affected due to gender inequalities.

Kulshreshtha and Singh (2005) report for India that women perform the majority of household work, and this work remains unreported in the System of National Accounts (SNA) partly due to convention and because it connotes human effort devoted to the production of goods and services with utility. However, the income is not generated through marketability, and therefore, measurement problems arise. Hence, the contribution women make to the economy and welfare remains invisible. Hirway and Jose (2011) found, based on various surveys by the National Sample Survey Organisation (NSSO) of India on "Employment and Unemployment Situation in India," that 90% of Indian women who do not participate in the labour force attribute a "pressing need for domestic work". Deshpande and Kabeer (2019) identified underlying reasons for lower participation of women in the labour force from a primary household survey conducted in seven districts of West Bengal, India. It was found that women who were not in the labour force contributed to expenditure-saving market activities. Further, educated and married women with primary responsibilities for child care and domestic chores were less likely than illiterate, divorced/separated/widowed women. In contrast, unmarried women were involved in the conventional labour force and, at the same time, contributed to expenditure-saving market activities rather than being out of the labour force.

Kaur and Uppal (2015) collected primary data for the Indian State of Punjab and used secondary data from NSSO. The results of this study show that the females' well-being index is lower than that of males' in both rural and urban areas. Further, the well-being index for rural women is lower than that for urban women. However, the inverse work intensity and overlapping work activities of urban women from marginalised social sections have the lowest index value, indicating a stressful life. Floro and Pichetpongsa (2010) developed a well-being index for home-based workers in urban squatter communities in Thailand using time dimensions. Their study reveals that, compared to men, women workers experience higher work intensity, which leads to a more stressful life and lower quality of life. Gender inequalities adversely impact the well-being index of women home-based workers, and their impact includes an off-kilter work-life balance due to their extended working hours and multitasking.

3. Methodology and Data Sources

This section is further divided into two parts. In the first part, the construction of the well-being index is discussed. In the second part, the share of individuals involved in activities (i.e., expenditure-saving market activities and household activities) in national accounts is discussed at the aggregate level and across gender.

3.1 Construction of Well-being Index

Considering the studies by Floro and Pichetpongsa (2010) and Kaur and Uppal (2015), this study focuses on the estimation of a well-being index for individuals engaged in household work and in expenditure-saving market work. The Index is developed to measure the well-being of the time-poor individuals by region, province and gender.

i. Well-Being Index and its Indicators

The well-being Index is constructed using three leading indicators: the household Income Index, the educational attainment index, and the inverse work intensity index. The educational attainment component index, edu_i for individual *i,* is formalised as:

$$edu_i = \frac{(Z_{edu,i} - min_j \{Z_{edu,i}\}}{\left(max_j \{Z_{edu,i}\} - min_j \{Z_{edu,i}\}\right)}$$

Where,

edu_i represents the level of educational attainment index for individual *i*
$min_j \{Z_{edu,i}\}$ is the minimum value of educational attainment
$max_j \{Z_{edu,i}\}$ is the maximum value of educational attainment

A higher value of this Index indicates a higher level of educational attainment; i.e., as educational attainment increases, an individual's well-being also increases. The range of this Index is from 0 to 1.
The component of the household income index[1] inc_i for individual '*i*' is formulated as:

$$inc_i = \frac{(\log\{Z_{inc,i}\} - \log\{min_i Z_{inc,i}\})}{\left(\log\{max_i \{Z_{inc,i}\}\} - \{\log\{min_i \{Z_{inc,i}\}\}\right)}$$

Where,

inc_i represents the household income of individual *i*
$min_i(Z_{inc,i})$ is the minimum income of the household
$max_i(Z_{inc,i})$ is the maximum income of the household

This Index also ranges from 0 to 1, where 0 indicates the minimum and 1 the maximum. A higher value indicates higher well-being of an individual.

Further, to calculate the inverse work intensity component of an individual (iwii), the average time spent on household work and/or expenditure-saving market work is used. Overlapping work intensity for unpaid contributing family workers is also taken into account by estimating average household work hours and expenditure saving from market hours. The Index for the unpaid contributing family worker is thus formalised as:

$$iwi_i = 1 - \frac{1}{2}\left[\frac{(\log\{Z_{iwi,i}\} - \log\{min_i \{X_{iwi,i}\})}{\left(\log\{max_j \{Z_{iwi,i}\} - \log\{min_i \{Z_{iwi,i}\}\}\right)} + \frac{(\log\{Z_{ov,i}\} - \log\{min_j \{Z_{ov,i}\})}{\left(\log\{max_i \{Z_{ov,i}\} - \log\{\min_i \{Z_{ov,i}\}\}\right)}\right]$$

Furthermore, the index value for the individual performing a household task is formulated as:

$$iwi_i = 1 - \frac{1}{2}\left[\frac{(\log\{Z_{iwi,i}\} - \log\{min_i \{X_{iwi,i}\})}{\left(\log\{max_i \{Z_{iwi,i}\} - \log\{min_i \{Z_{iwi,i}\}\}\right)}\right.$$

Where

$Z_{iwi,i}$ represents the length of a working day (in hours/week) of an individual *'i'*
$Z_{ov,i}$ is the length of the overlapped work activity (in hours/week) of an individual' *i*'.
$max_i (Z_{iwi,i})$ is the maximum value of the working days in a week
$min_i (Z_{iwi,i})$ is the minimum value of a working day in a week
$max_i (Z_{ow,i})$ is the maximum value of overlapping working days in a week
$min_i (Z_{ow,i})$ is the minimum value of overlapping working days in a week

[1] Household Income is used because individuals involved in household work and unpaid contributing family workers do not have personal income and they rely on household income.

The inverse work intensity index component again ranges from 0 to 1. As the value of this Index moves towards 0, this indicates higher work intensity, meaning a "*stressful life*", and a value close to 1 indicates a low level of work intensity, meaning a "*stress-free life*".

Finally, by combining the components of educational attainment, household income and inverse work intensity, individual well-being is formulated as

$$WBI_i = \sum i \frac{X_{ji}}{k}$$

Where,

WBI represents an individual's well-being index, which ranges from 0 to 1.
X_j represents the educational attainment, household income, and inverse work intensity indices, as discussed above, and k represents the components of the Index.

The higher the value of the Index, the higher the well-being of an individual; a lower value indicates lower well-being.

ii. Calculating Share in GDP

To measure the nation's welfare and to increase the well-being of society, the value of activities (i.e., expenditure on saving, market work, and household work) should be considered in measuring national accounts. It is imperative that the contribution made by individuals, especially women, who are involved in the above-mentioned activities, be estimated at the aggregate level and by gender. In order to value these activities, the following formula is estimated, given by Grabowski (2016):

$$(V \cdot Tm \cdot W \cdot Pm) + (V \cdot Tw \cdot W \cdot Pw)$$

Where,

- V stands for the opportunity cost[2] of household work and expenditure, and for the market work per week performed by the individual.
- T stands for hours per week spent on household tasks and on expenditure-saving market work.
- W stands for the total number of weeks in a year.
- P stands for population size engaged in household tasks, expenditure, and expenditure-saving for market work.

The script *m* and *w* represent men and women, respectively.

The share of household work and expenditure-saving market work in GDP is estimated at the aggregate level as:

$$\%\ of\ GDP = \left(\frac{contribution\ of\ general\ population}{GDP\ at\ current\ prices}\right) * 100$$

$$\%\ of\ GDP\ by\ gender = \left[\left(\frac{(V.T_m . W.P_m) + (V.T_w . W.P_w}{GDP\ at\ current\ price}\right)\right] * 100 \quad \text{_____ (1)}$$

The share of males and females in GDP is formulated as:

$$\%\ of\ GDP\ by\ gender = \left(\frac{contribution\ of\ population\ by\ gender}{GDP\ at\ current\ prices}\right) * 100$$

[2] Opportunity cost is estimated by the method proposed by James (1996) i.e. OC=(Hours*MinWage)

$$\%\ of\ GDP\ by\ gender = \left[\left(\frac{V \cdot T_g \cdot W \cdot P_g}{GDP\ at\ current\ price}\right)\right] * 100 \quad \text{_____} \quad (2)$$

Where g represents the gender.

To analyse the well-being index and the share of activities (Household work and expenditure-saving market work) in GDP, data on individuals involved in household work and unpaid contributing family workers are used from different issues of the Labour Force Survey (LFS) of Pakistan 1994, 2001, 2007, 2014 and 2018. Data on GDP are gathered from the World Development Indicators (WDI) for same years.

3.2 Model Specification

To explore the determinants of well-being, the following model is used and was also employed by Pichetpongsa and Floro (2010).

$$WBI_{g,s} = \text{f}\,(PC, SDC, Region, Province, DY) \quad \text{_____} \quad (3)$$

Where

WBI represents the well-being index, and the subscript *g* represents gender, and the subscript *s* represents the individuals involved in household work and expenditure saving market work. PC represents the personal characteristics of the individuals involved in these activities, SDC represents the socio-demographic characteristics of the individuals, such as number of dependents, household size, etc., and DY represents the dummy variable for years.

WBI is used as a dependent variable, and its construction is defined in section 3 by using the educational attainment index, household income index and inverse work intensity index. The Well-being index for females and males involved in household work is 0.406 and 0.449, respectively, whereas the well-being index for individuals involved in expenditure-saving market work is 0.175 for females and 0.363 for males. The well-being index of females involved in household work or in expenditure-saving market work is lower due to their higher inverse work intensity index and lower education attainment index.

As for explanatory variables, the personal characteristics used in this model are age, age2, and a dummy variable for marital status. Age may have a positive effect on WBI of individuals, as individuals may have lower responsibilities in their early ages. Using age^2, it is hypothesised that individuals' well-being decreases with increasing age due to increased responsibilities. On the contrary, age may have an opposing effect on individuals' well-being, due to lower educational attainment indices and higher work intensity indices, whereas age2 may be positive due to lower work intensity indices.

The effect of married and widowed/divorced individuals involved in household work may be negative, as their inverse work intensity increases, lowering their well-being. The effect of married and widowed/divorced individuals engaged in expenditure-saving market work may be positive due to a lower work intensity index, as societal trends are changing and individuals are moving towards paid market work. Nevertheless, individuals may have an adverse effect on WBI, as those residing in rural and peri-urban areas are mostly engaged in expenditure-saving market activities, which increase their work hours, thereby lowering their well-being.

The well-being index is mainly influenced by the number of dependents residing in a household. As the number of dependents increases, it may adversely affect the well-being of individuals performing

domestic tasks. Besides performing other household chores, the responsibility of looking after dependents is shouldered by women, which increases their work hours and, in turn, lowers their well-being. An increase in the number of dependents may have a undesirable effect on individuals, especially females, involved in expenditure-saving market work, due to an uneven burden, leading to a stressful life and declining well-being.

Across the region, the rural region is used as a reference category. The effect of urban dwellers on individuals' well-being may be positive or negative. It may have a positive effect on individuals involved in household work due to the availability of domestic servants, home-saving appliances, and easy food preparation, leading to a decline in their work hours. On the contrary, urban dwellers may experience negative effects on their well-being due to a nuclear family setup, vile social conditions, and inflation, which may increase their household work hours. The effect of urban residents may be negative for unpaid family workers, as these activities are lower in urban areas, leading to a decline in their work-hour intensity.

Across the provinces, KPK is used as a reference category. The residents of Punjab, Sindh and Balochistan may have a positive or negative effect on individuals' well-being, depending on the province's socio-economic conditions and traditions.

4. Results and Discussion

The result section is further divided into three parts: the first part provides an assessment of the well-being index along with its indicators, and the second part presents the empirical assessment of its determinants. The third part is based on the assessment of the share of activities (household work and expenditure-saving market work) in GDP.

4.1 Assessment of Well-being Index

This section highlights the components and the overall well-being index for individuals involved in household work and expenditure-saving market work across regions and provinces for both genders.

Well-being indices for individuals involved in household tasks and in expenditure-saving market work are given in Tables 1 and 2 for both males and females. Both tables show that the males' well-being index is higher than that of females. It has increased for males involved in household work from 0.421 to 0.449 and declined for females involved in the same work from 0.461 to 0.406. Whereas, the annual growth rate of household work has accelerated by 2.23% for males and reduced by 2.97% for females. The well-being index for unpaid contributing family workers has increased for males from 0.308 to 0.335, and for females, it has decreased from 0.253 to 0.175. At the same time, the annual growth rate of expenditure-saving market work has accelerated by 3.18% for males and decreased by 7.65% for females. Females, whether involved in household work or in expenditure-saving market work, have higher inverse work intensity indices, which lead to a more stressful life. Unpaid female family workers, besides being engaged in agricultural fields and home-based work, also perform household chores, including fetching water, collecting fodder and firewood, etc., as mentioned above. Further, in lower-income families, they are deprived of educational opportunities, which lowers their educational attainment index and, in turn, their well-being. On the other hand, males' contribution to expenditure-saving market activities has decreased, and they occasionally perform household activities, thereby lowering their inverse work intensity index and increasing their well-being. Further, their educational attainment index is higher, as most households place greater importance on male education than on female education, thereby increasing their well-being (Table A-1 and A-2).

In Tables 3 and 4, the well-being indices of both males and females involved in the activities (household work and expenditure saving market work) across regions and provinces are discussed in detail. The well-being index of individuals involved in household work is higher in rural Punjab for both genders, while it is lower in rural Balochistan. In rural Balochistan, the education attainment index for

males is lower, as they may have lower levels of education or be illiterate. The well-being index for both genders is higher in urban Sindh and lower in urban Balochistan. The annual growth rate of household work has accelerated by 5.3% for males residing in rural Punjab and by 14.1% for males residing in urban KPK, whereas it has decreased for females in both regions and across all provinces. Moreover, based on the data, household work is necessary for females, which increases their workload intensity, leading to a stressful life. The well-being index for both genders is lower in rural regions, and it is lower for rural females than for their urban counterparts. As in urban regions, maids perform some of the household tasks, some household activities (such as laundry, pressing, etc.) are purchased from the market, and further household appliances, ready-made food items, etc. have reduced the working hours of urban women, leading to a decline in their inverse work intensity index and have increased their well-being.

The well-being index for unpaid contributing family workers is higher in rural Punjab and lower in rural Balochistan for both genders. While it is higher for males in urban Sindh and for females in urban Punjab, and lower for both genders in urban Balochistan. The annual growth rate of expenditure-saving market work for males is higher in both regions of KPK, i.e., 19.16% and 27.51%, whereas it has declined for females in all provinces of the rural region and increased for females in urban KPK by 0.786%. In both regions and all provinces, the male well-being index is higher due to higher educational attainment and lower inverse work intensity. In contrast, the female well-being index is lower due to a lower educational attainment index and a higher inverse work-intensity index, as noted above. Rural women are involved in subsistence farming, crop production, livestock care, and home-based activities, and, in addition to these activities, they also perform household chores, which increases their workload and lowers their well-being compared to their urban counterparts (Table A-3 and A-4).

4.2 Empirical Results

The determinants of the well-being index for individuals involved in household work and expenditure saving market work are outlined in equation (3) and are presented in Table 5 (a) and (b) for both genders.

As far as explanatory variables are concerned, age and age squared have a significant, albeit minor, impact on the well-being index of individuals involved in household work and in expenditure-saving market work. Since housework for females starts at an early age, fewer responsibilities increase their well-being. Moreover, young females participate in minor, low-workload expenditure-saving market work, which increases their well-being. However, age-squared reveals the non-linearity, showing that as age increases, the burden of domestic responsibilities rises, lowering their well-being. Young men have fewer household responsibilities, which increases their well-being. As they age, their participation in household work and in expenditure-saving market work increases, leading to longer working hours and a decline in their well-being. Being married and a widow/divorced female who is involved in household work decreases their well-being.

As household work is considered customary and mandatory for women, regardless of their marital status, higher inverse work intensity indices are associated with lower well-being. Well-being drops for married and/or widowed/divorced males, specifically those involved in household and expenditure saving market work. Usually, males are involved only in household activities performed outside the house, and in areas where women's mobility is restricted, these activities are performed by them. Whereas, males who are employed as unpaid contributing family workers, their workload increases due to gender assigned roles and other socio-economic factors. Our results indicate that being married, male or female, and being involved in household work significantly reduce well-being by 7.84% points at the 1% level and 1.8% points at the 1% level, respectively. Being a widow/divorced male or female who is involved in household work significantly reduces their well-being index by 11% points at the 1% level and 2.06% points at the 1% level, respectively. Being married and widowed/divorced males involved in

expenditure-saving market work significantly reduces their well-being index by 6.98% points at the 1% level and 10.5% points at the 1% level.

An increase in the number of dependents in a household decreases the well-being of individuals involved in household work and in expenditure-saving market work. Since the responsibility of caring for elders, childbearing, and rearing is borne by women, who also perform other household duties, their inverse work intensity index increases, hence lowering their well-being. The well-being of males involved in household work decays as they assist females with household activities performed outside the home. Well-being index of unpaid female family workers diminishes with an increase in the number of dependents, especially children under 10 years and elders above 65 years in a household, as they allocate the majority of their time to child/elder care besides their expenditure-saving market activities, leading to an increase in their inverse work intensity index, indicating their stressful life. An increase in the number of dependents of individuals involved in household work significantly reduces their well-being index by 0.24% points at 5% level for males and 0.43% points at 1% level for females. In contrast, an increase in the number of dependents for females involved in expenditure-saving market work significantly decreases their well-being index by 3.5% points at 1% level.

When comparing urban and rural regions, individuals in urban regions have higher well-being. Due to diversified employment and educational opportunities, higher wages, and employment benefits, these factors are driving their participation in expenditure-saving work and increasing their well-being. The well-being of individuals involved in household work is higher in urban areas due to labour-saving technologies, easier food preparation, and the affordability of maids, especially for middle and higher-income families. Additionally, they outsource some household services (e.g., laundry, pressing, etc.), as noted above. Being resident of urban region significantly reduces the well-being of male and female involved in household work by 8.5% points at 1% level and 9.6% points at 1% level respectively, whereas being resident of urban region significantly reduces the well-being of male and female involved in expenditure saving market work by 10.5% points at 1% level and 22.86% points at 1% level respectively. Compared to KPK, the well-being of individuals involved in household work in Punjab and of females in Sindh is higher, reflecting cultural norms, provincial traditions, and the facilities available to them. At the same time, it is lower in Balochistan due to constraints imposed by cultural norms and traditions, as well as the lack of services available to them (e.g., household services). Compared to KPK, male unpaid family workers residing in Punjab have higher well-being, while the well-being of unpaid female family workers residing in Sindh and unpaid male family workers residing in Balochistan is lower.

Year dummies have a positive or negative, significant effect on individuals involved in household work and in expenditure-saving market work. The value of R^2 for household work for males and females is 14.3% and 15.3%, respectively, whereas for expenditure-saving market work, it is 24.4% for females and 11.6% for males. (Table A-5 (a) and (b))

4.3 Assessment of GDP Share

This section highlights the share of GDP after accounting for the economic contributions of individuals engaged in household work and expenditure-saving market work at the macro level, and further measures the share of GDP after accounting for the contributions of both males and females.

Table 6 (a) and (b) show the results for the macro-level share of GDP, estimated using the method proposed by James (1996). The value of GDP is estimated by using formula (1) at the macro level and formula (2) for measuring the economic contribution made by males and females separately, as discussed in section 3 (part ii).

Table 6(a) specifies the share of household work in GDP, and the shares for both genders are presented in Table 6(b). The share of household work in GDP increased from 31% to 43.35% over the

period 1994 to 2017, and its annual growth rate accelerated by 10.24%. The share of females in household work has increased from 30.76% to 37.52%, with an annual growth rate accelerating by 5.49%, while the male share has increased slowly by 5.17% to 5.84%, with an annual growth rate accelerating by 4.28%. Compared to males, the female share of GDP is higher because household work falls on her shoulders (Table A-6 (a) and (b)).

The share of expenditure-saving market work at the aggregate level and for both males and females is presented in Tables 7(a) and 7 (b), respectively. The share of unpaid contributing family workers in GDP declined by 23.08% from 9.14% to 6.86% over the period 1994-2017, and its annual growth rate declined by 15.09%. The share of male unpaid family workers in GDP has declined by 15.75% to 4.01%, and its annual growth rate has also declined by 24.84%, whereas the share of female unpaid family workers in GDP has reduced from 23.08% to 5.13%, and its annual growth rate has also declined by 19.44%. Over the years, share of these activities have declined in GDP as most of the individuals migrated from rural to urban areas in search of better livelihood, individuals especially females acquire minimum wages from these activities, individuals work is unrecognised, they are not given any employment benefits and job security, lack of medical facilities for injured persons declines their work hours, hence their share also diminishes in GDP. Grabowski (2016) examined Sweden and Germany and concluded that GDP growth has declined over the past 10 years; further, women's contributions are larger in GDP and NNI (Table A-7 (a) and (b)).

5. Conclusion and Policy Implications

This study explores the well-being index for individuals involved in household work and expenditure-saving market work across regions and provinces for both genders by employing time use dimension. The study's findings reveal that the well-being index of females is lower in both regions and all provinces for both activities, compared to their male counterparts, due to their higher work intensity index and lower educational attainment index. Further, well-being index of rural female is lower as compared to urban female due to their higher work intensity index and lower education attainment index, as in rural areas female, besides being engaged in agricultural and/or home-based activities are also engaged in chores, are usually deprived of educational and employment opportunities which increase their work burden leading towards a stressful life and lowering their well-being.

The determinants of well-being show that being married and/or widowed/divorced, and being involved in household work, are associated with lower well-being. Whether they are married, widowed, or divorced, the responsibility for household work falls on women; however, the workload for men increases, particularly in areas where women's mobility is restricted. Therefore, household activities performed outside the home increase household hours, lowering well-being. The well-being of married and widowed/divorced males engaged in expenditure-saving market work declines, as most of the activities (such as driving a tractor, selling products in the market, etc.) they undertake increase their workload. Compared to the rural region, the well-being index of individuals engaged in household work and in expenditure-saving market work is higher in the urban region.

Moreover, the share of household work in GDP may rise from 31% to 43.35%. Further to this, as previously mentioned, the share of females in the workforce is higher in GDP because family and household responsibilities fall on their shoulders. While the share of expenditure-saving market work in GDP has declined from 23.08% to 9.14%. The share of both genders has also declined over the years.

To improve an individual's quality of life, a range of programs, policies, and social services is needed, benefiting policymakers and the general public. Since the most important asset of poor households is labour, antipoverty programs need to prioritise the increase in women's proficiencies and decent work opportunities and protect their rights, which also addresses the time demands of their work (household work).

Economic policies that raise income, especially among women engaged in expenditure-saving market work by increasing their work hours, will not necessarily translate into a better quality of life. If the policies increase their overall workload, they will lead to greater work intensification and exacerbate the problems of balancing household responsibilities with their work. The inverse work intensity index component indicates that programs and policies that provide affordable childcare, healthcare, and decent work conditions, while protecting workers' rights, are vital if governments want to improve their citizens' welfare. This policy will help achieve target 8.5 of the SDGs.

Policies need to be designed to reduce the unacceptable burden on individuals engaged in household and expenditure-saving market work who are not being compensated. There should be policies targeting consumption goods, particularly for household members/unpaid contributing family workers, who often find that the household's own preferences for allocation supersede those of policy planners, thereby helping achieve Target 8.8 of the SDGs. It is recommended from this study that government officials should be convinced to include women's work (household and expenditure saving market work) in economic measurements of the nation (such as GDP), and to incorporate an understanding of women's value when looking at programs to assist women as such programs represent a tiny return on women's contribution to society, rather than a net cost.

This research is a pioneer in establishing the fact that is expected to increase understanding among policymakers and researchers of the economic contributions made by women through household and expenditure-saving market work.

Acknowledgement:
The authors acknowledge comments from the editor and anonymous reviewers.

Data Availability Statement:
Data will be provided on demand.

Funding:
This research has received no funding.

Conflict of Interest Disclosure Statement:
There is no conflict of interest among the authors of the study.

Ethical Approval:
This research article has not violated any ethical standards.

References

Aronoff, S. (1989). *Geographic information systems: A management perspective*. WDL Publications.

Arshad, A. (2008). *The economic contribution of Pakistani women through their unpaid labor* (Report). Society for Alternative Media and Research; Health Bridge; CIDA.

Clark, C. (1958). The economics of housework. *Bulletin of the Oxford Institute of Statistics*.

Clermont, L., & Aligica, P. (1999). Households' non-SNA production: Labour time, value of labour and of product, and contribution to extended private consumption. *Review of Income and Wealth*, *45*(4), 519–529.

Deshpande, A., & Kabeer, N. (2019). *(In)Visibility, care and cultural barriers: The size and shape of women's work in India* (DP No. 04/19). University of Massachusetts Amherst.

Dijikstra, Geske and Lucia Hammer 2000. Measuring Socio-Economic Gender- Inequality: Toward an Alternative to the UNDP Gender-Related Development Index. *Feminist Economics 6*(2): 41–75.

Floro, M. S., & Pichetpongsa, A. (2010). Gender, work intensity, and well-being of Thai home-based workers. *Feminist Economics*, *16*(3), 5–44.

Folbre, N. (2008). *Valuing children: Rethinking the economics of the family*. Harvard University Press.

Frances, M., McGinnity, F., & Russell, H. (2005). *The distribution of caring, housework and employment among women and men in Ireland*. The Equality Authority & Economic and Social Research Institute (ESRI).

Grabowski, K. (2016). *To value household work* (Bachelor's thesis). Lund University, School of Economics and Management.

Hirway, I., & Jose, S. (2011). Understanding women's work using time-use statistics: The case of India. *Feminist Economics, 17*(4), 67–92.

James, T. (1996). *The valuation of household production: How different are the opportunity cost and market price valuation methods?* Paper presented at Brigham Young University.

Kaur, R., & Uppal, S. (2015). The unpaid activities and well-being: Measurement issues, challenges and limitations. In *IARIW–OECD Special Conference "W(h)ither the SNA?"* Paris, France.

Kucera, D., & Roncolato, L. (2008). Informal employment: Two contested policy issues. *International Labour Review, 147*(4), 321–348.

Kulshreshtha, R., & Singh, O. P. (2005). *Valuation of non-market household production*. Central Statistical Organisation, Government of India.

Kuznets, S. (1944). *National income and its composition, 1919–1938*. National Bureau of Economic Research.

Labor Force Survey of Pakistan. (Various years). Pakistan Bureau of Statistics.

Landefeld, J. S., & McCulla, S. H. (2000). Accounting for non-market household production within a national accounts framework. *Review of Income and Wealth, 46*(3), 289–307.

Mitchell, B. R., Burns, A. F., Stewart, W., & Macaulay, F. R. (1921). *Income in the United States: Its amount and distribution, 1909–1919*. National Bureau of Economic Research.

Nordhaus, W. D., & Tobin, J. (1972). Is growth obsolete? In M. Moss (Ed.), *The measurement of economic and social performance* (pp. 509–564). National Bureau of Economic Research.

Nussbaum, M. (2000). *Women and human development: The capabilities approach*. Cambridge University Press.

Nussbaum, M. (2003). Selecting relevant capabilities. *Feminist Economics, 9*(2–3), 33–61.

Poza, A., Schmid, H., & Widmer, F. (2001). The allocation and value of time assigned to housework and childcare: An analysis for Switzerland. *Journal of Population Economics, 14*(2), 599–618.

Robeyns, I. (2003). Sen's capability approach and gender inequality: Selecting relevant capabilities. *Feminist Economics, 9*(2–3), 61–92.

Sen, A. (1993). Capability and well-being. In M. Nussbaum & A. Sen (Eds.), The quality of life (pp. 30–53). Oxford University Press.

Sen, A. (2000). Human development and economic sustainability. *World Development, 28*(12), 2029–2049.

United Nations Development Programme. (1995). Human development report 1995. Oxford University Press.

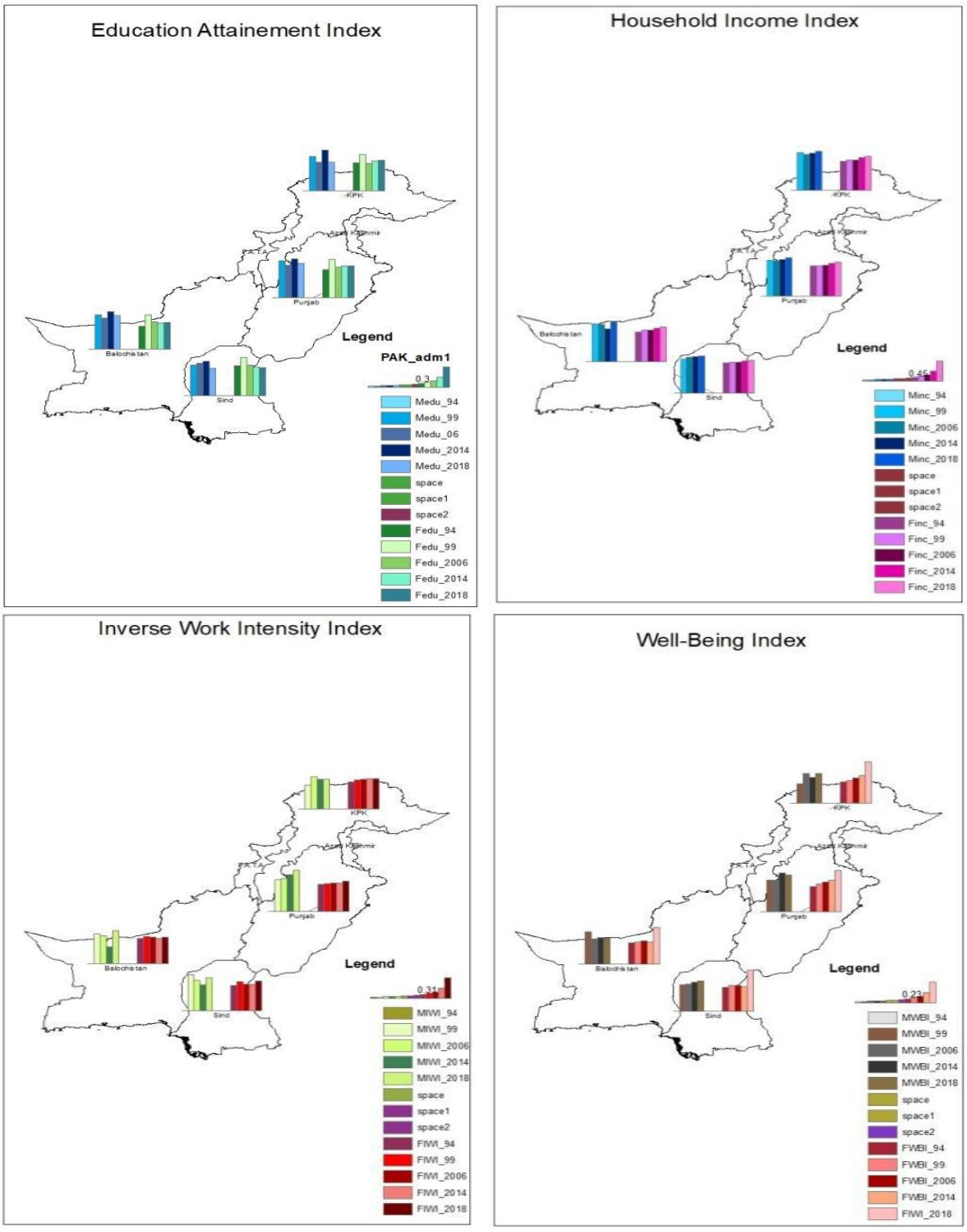
Wolff, E. N., & Zacharias, A. (2003). The Levy Institute measure of economic well-being (Working Paper No. 372). Levy Economics Institute.

World Bank. (Various years). *World development indicators*. The World Bank.

Zick, C. D., & Bryant, W. K. (1985). Income distribution implications of rural household production. *American Journal of Agricultural Economics, 67*(5), 1157–1161.

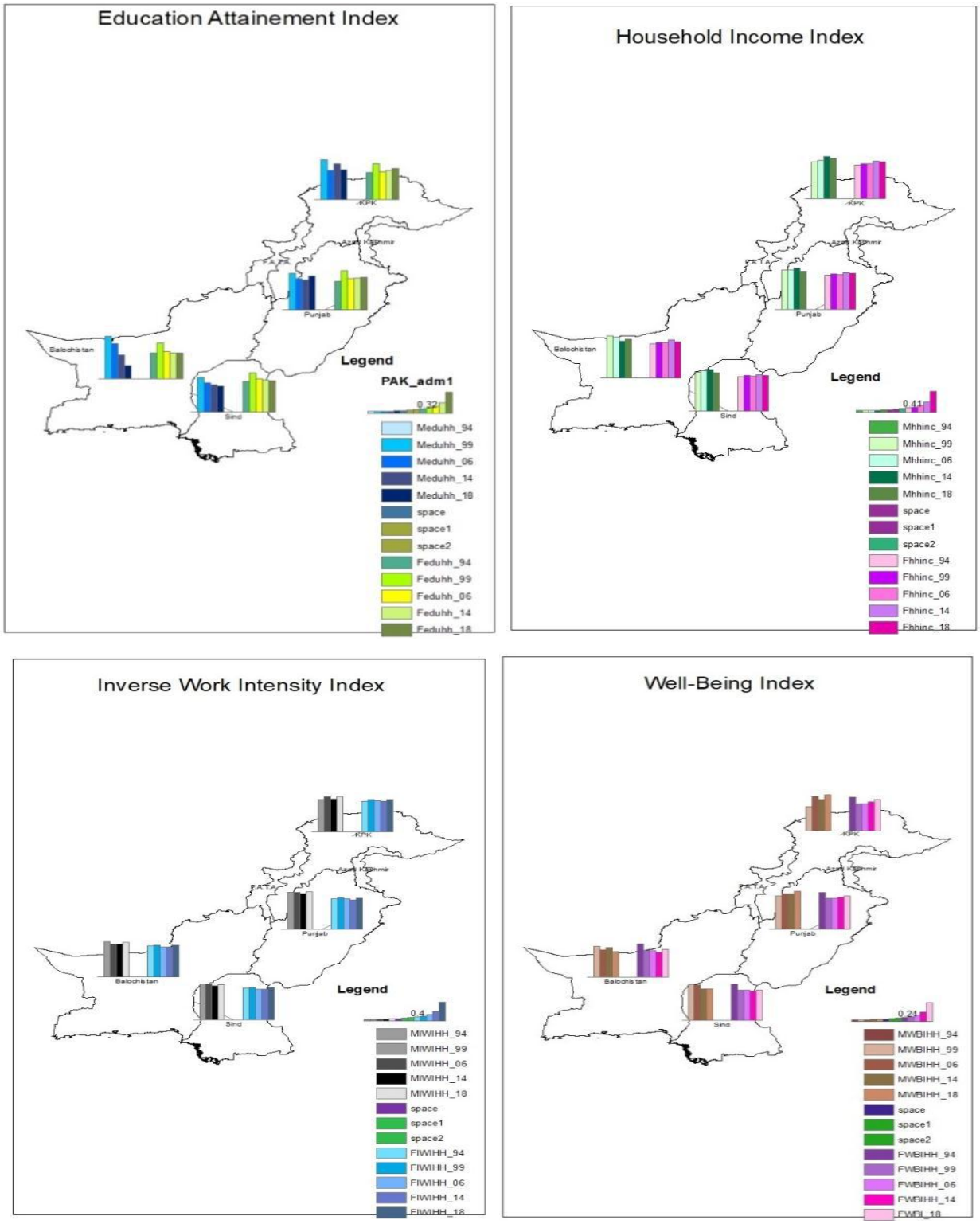
Appendices

Figure A-1: Indicators of Well-being Index for Unpaid Family Workers across Provinces



Source: Author's estimation based on different issues of LFS and from DIVA.GIS.

Figure A-2: Indicators of Well-being Index for Individuals involved in Household Work across Provinces



Source: Author's own estimation based on different issues of LFS and from DIVA.GIS.

Table A-1: Well-being Index of Individuals Involved in Household Work

Years	Male				Female			
	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index
1994-95	0	0	0	0	0.436	0.662	0.652	0.461
1999-00	0.554	0.761	0.752	0.421	0.580	0.688	0.668	0.379
2006-07	0.459	0.760	0.751	0.447	0.466	0.686	0.640	0.381
2014-15	0.478	0.770	0.733	0.442	0.474	0.665	0.629	0.384
2017-18	0.470	0.755	0.757	0.449	0.477	0.699	0.666	0.406
Annual Growth Rate								
	Male	Female						
	2.228	-2.972						

Source: Author's own estimation based on different issues of LFS

Table A-2: Well-being Index for Unpaid Contributing Family Workers

Years	Male						Female					
	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Overlap Work Intensity Index	Inverse Work Intensity Index	Well Being Index	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Overlap Work Intensity Index	Inverse Work Intensity Index	Well Being Index
1994-95	0	0	0	0	0	0	0.427	0.659	0.747	0.647	0.394	0.253
1999-00	0.520	0.792	0.740	0.716	0.462	0.308	0.565	0.678	0.753	0.661	0.422	0.274
2006-07	0.461	0.791	0.735	0.743	0.476	0.319	0.444	0.680	0.780	0.637	0.417	0.284
2014-15	0.574	0.804	0.725	0.731	0.482	0.360	0.446	0.724	0.768	0.639	0.408	0.288
2017-18	0.465	0.853	0.758	0.749	0.520	0.338	0.447	0.178	0.780	0.659	0.439	0.175
Annual Growth Rate												
	Male	Female										
	3.1821	-7.653										

Source: Author's own estimation based on different issues of LFS

Table A-3: Well-being Index of Individuals Involved in Household Work by Region and Province

Years	Region	Province	Male				Female			
			Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index
1994-95	Rural	KPK	0	0	0	0	0.328	0.639	0.644	0.409
		Punjab	0	0	0	0	0.345	0.639	0.649	0.428
		Sindh	0	0	0	0	0.303	0.642	0.672	0.408
		Balochistan	0	0	0	0	0.214	0.653	0.654	0.407
1999-00		KPK	0.619	0.725	0.676	0.673	0.452	0.659	0.666	0.309
		Punjab	0.529	0.759	0.764	0.403	0.499	0.662	0.664	0.335
		Sindh	0.357	0.765	0.747	0.623	0.453	0.658	0.680	0.303
		Balochistan	0.000	0.799	0.731	0.510	0.459	0.678	0.666	0.306
2006-07		KPK	0.398	0.736	0.718	0.417	0.358	0.667	0.647	0.332
		Punjab	0.421	0.746	0.760	0.421	0.387	0.668	0.643	0.362
		Sindh	0.267	0.735	0.761	0.351	0.320	0.669	0.643	0.325
		Balochistan	0.267	0.796	0.690	0.324	0.295	0.688	0.630	0.303
2014-15		KPK	0.480	0.765	0.675	0.355	0.392	0.666	0.639	0.348
		Punjab	0.444	0.770	0.746	0.436	0.427	0.650	0.622	0.375
		Sindh	0.187	0.779	0.715	0.389	0.364	0.643	0.643	0.336
		Balochistan	0.367	0.781	0.667	0.414	0.260	0.671	0.627	0.294
2017-18		KPK	0.404	0.775	0.730	0.438	0.422	0.698	0.673	0.380
		Punjab	0.458	0.736	0.792	0.467	0.430	0.688	0.658	0.397
		Sindh	0.277	0.738	0.732	0.369	0.361	0.675	0.685	0.356
		Balochistan	0.067	0.774	0.694	0.287	0.337	0.702	0.660	0.333
1994-95	Urban	KPK	0	0	0	0	0.449	0.669	0.643	0.478
		Punjab	0	0	0	0	0.464	0.670	0.640	0.521
		Sindh	0	0	0	0	0.481	0.689	0.668	0.532
		Balochistan	0	0	0	0	0.407	0.681	0.656	0.475
1999-00		KPK	0.571	0.679	0.657	0.340	0.59026	0.689	0.671	0.408

Years	Region	Province	Male				Female			
			Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index	Education Attainment Index	Household Income Index	Inverse Work Intensity Index	Well Being Index
		Punjab	0.571	0.763	0.779	0.483	0.622	0.705	0.661	0.460
		Sindh	0.571	0.759	0.764	0.497	0.613	0.712	0.682	0.465
		Balochistan	0.643	0.838	0.757	0.581	0.558	0.711	0.660	0.387
2006-07		KPK	0.493	0.760	0.767	0.475	0.485	0.690	0.642	0.408
		Punjab	0.528	0.771	0.773	0.510	0.524	0.698	0.634	0.449
		Sindh	0.473	0.796	0.756	0.564	0.562	0.711	0.636	0.470
		Balochistan	0.800	0.807	0.694	0.423	0.451	0.704	0.632	0.389
2014-15		KPK	0.558	0.812	0.680	0.427	0.482	0.689	0.635	0.401
		Punjab	0.499	0.750	0.763	0.491	0.538	0.671	0.621	0.456
		Sindh	0.700	0.803	0.732	0.489	0.569	0.682	0.623	0.476
		Balochistan	0	0	0.760	0.253	0.445	0.690	0.629	0.370
2017-18		KPK	0.528	0.788	0.748	0.484	0.512	0.717	0.667	0.433
		Punjab	0.573	0.751	0.779	0.522	0.547	0.711	0.651	0.476
		Sindh	0.563	0.761	0.795	0.590	0.572	0.713	0.677	0.506
		Balochistan	0.267	0.728	0.821	0.438	0.435	0.717	0.663	0.398

Annual Growth Rate

		Male	Female
Rural	KPK	-11.632	-1.785
	Punjab	5.34	-1.796
	Sindh	-13.612	-3.203
	Balochistan	-14.58	-4.57
Urban	KPK	14.084	-2.331
	Punjab	2.68	-2.15
	Sindh	6.28	-1.200
	Balochistan	-8.224	-4.059

Table A-4: Well-being Index of Unpaid Contributing Family Workers by Region and Province

Years	Region	Province	Male						Female					
			EAI	HHII	PWI	OWI	IWI	WBI	EAI	HHII	PWI	OWI	IWI	WBI
1994-95	Rural	KPK	0	0	0	0	0	0	0.325	0.638	0.757	0.641	0.398	0.206
		Punjab	0	0	0	0	0	0	0.351	0.638	0.750	0.641	0.391	0.224
		Sindh	0	0	0	0	0	0	0.312	0.639	0.697	0.668	0.365	0.195
		Balochistan	0	0	0	0	0	0	0.218	0.656	0.719	0.646	0.366	0.201
1999-00		KPK	0.457	0.734	0.754	0.622	0.349	0.187	0.467	0.661	0.759	0.663	0.421	0.217
		Punjab	0.545	0.787	0.728	0.716	0.434	0.330	0.497	0.644	0.711	0.655	0.391	0.235
		Sindh	0.357	0.805	0.703	0.722	0.512	0.218	0.452	0.658	0.728	0.675	0.405	0.205
		Balochistan	0.714	0.799	0.706	0.691	0.436	0.241	0.466	0.679	0.736	0.666	0.402	0.216
2006-07		KPK	0.398	0.780	0.761	0.707	0.473	0.316	0.363	0.665	0.786	0.644	0.430	0.254
		Punjab	0.473	0.777	0.716	0.750	0.461	0.319	0.386	0.665	0.769	0.644	0.413	0.278
		Sindh	0.311	0.776	0.678	0.757	0.423	0.235	0.325	0.668	0.744	0.638	0.381	0.230
		Balochistan	0.367	0.795	0.702	0.712	0.406	0.238	0.264	0.684	0.758	0.631	0.389	0.217
2014-15		KPK	0.527	0.788	0.709	0.688	0.452	0.237	0.388	0.722	0.788	0.652	0.440	0.280
		Punjab	0.596	0.794	0.757	0.771	0.554	0.409	0.427	0.715	0.774	0.623	0.397	0.305
		Sindh	0.455	0.811	0.685	0.724	0.389	0.310	0.358	0.701	0.736	0.654	0.390	0.243
		Balochistan	0.636	0.000	0.657	0.657	0.248	0.295	0.252	0.731	0.738	0.635	0.374	0.211
2017-18		KPK	0.394	0.866	0.768	0.664	0.424	0.294	0.410	0.181	0.774	0.667	0.441	0.162
		Punjab	0.513	0.851	0.786	0.821	0.630	0.418	0.417	0.147	0.799	0.644	0.443	0.199
		Sindh	0.242	0.822	0.740	0.746	0.494	0.302	0.352	0.177	0.761	0.677	0.438	0.151
		Balochistan	0.436	0.896	0.706	0.692	0.397	0.201	0.350	0.187	0.745	0.653	0.398	0.133
1994-95	Urban	KPK	0	0	0	0	0	0	0.462	0.668	0.791	0.631	0.422	0.293
		Punjab	0	0	0	0	0	0	0.459	0.671	0.796	0.626	0.422	0.339
		Sindh	0	0	0	0	0	0	0.471	0.683	0.738	0.662	0.400	0.329
		Balochistan	0	0	0	0	0	0	0.369	0.673	0.766	0.652	0.418	0.287
1999-00		KPK	0.571	0.889	0.751	0.681	0.370	0.246	0.613	0.685	0.794	0.664	0.458	0.333
		Punjab	0.554	0.781	0.792	0.754	0.588	0.379	0.621	0.699	0.800	0.642	0.442	0.397
		Sindh	0.543	0.742	0.777	0.786	0.549	0.350	0.594	0.699	0.807	0.676	0.482	0.383

Years	Region	Province	Male						Female					
			EAI	HHII	PWI	OWI	IWI	WBI	EAI	HHII	PWI	OWI	IWI	WBI
		Balochistan	0.464	0.838	0.728	0.725	0.451	0.463	0.526	0.709	0.756	0.659	0.415	0.311
		KPK	0.474	0.809	0.781	0.773	0.595	0.340	0.497	0.693	0.828	0.632	0.461	0.346
		Punjab	0.493	0.798	0.775	0.765	0.553	0.379	0.520	0.693	0.828	0.620	0.447	0.390
2006-07		Sindh	0.724	0.852	0.754	0.814	0.580	0.473	0.544	0.700	0.817	0.635	0.452	0.393
		Balochistan	0.495	0.860	0.745	0.729	0.479	0.319	0.451	0.704	0.786	0.630	0.416	0.314
		KPK	0.691	0.823	0.758	0.650	0.408	0.426	0.509	0.750	0.845	0.636	0.481	0.384
		Punjab	0.530	0.823	0.805	0.729	0.541	0.450	0.533	0.737	0.850	0.612	0.462	0.367
2014-15		Sindh	1.000	0.000	0.714	0.755	0.470	0.490	0.524	0.736	0.808	0.626	0.434	0.427
		Balochistan	0.545	0.724	0.729	0.000	0.000	0.290	0.462	0.755	0.754	0.636	0.390	0.405
		KPK	0.564	0.865	0.835	0.655	0.534	0.450	0.532	0.208	0.829	0.655	0.484	0.302
		Punjab	0.521	0.809	0.815	0.772	0.578	0.365	0.544	0.164	0.842	0.631	0.473	0.252
2017-18		Sindh	0.758	0.874	0.724	0.755	0.581	0.609	0.543	0.191	0.831	0.661	0.492	0.233
		Balochistan	0.538	0.889	0.760	0.841	0.640	0.375	0.436	0.161	0.755	0.652	0.408	0.152

Annual Growth Rate

		Male	Female
	KPK	19.158	-5.387
	Punjab	8.855	-2.785
	Sindh	12.750	-5.684
Rural	Balochistan	-5.635	-8.377
	KPK	27.512	0.786
	Punjab	-1.238	-6.398
	Sindh	24.560	-7.295
Urban	Balochistan	-6.36	-11.725

Source: Author's own estimation based on different issues of LFS

Table A-5 (a): Determinants of Well-being Index for Individuals Involved in Household Work

Dependent Variable: Well-being Index	Male	Female
Constant	0.314*** (0.0211)	0.429*** (0.00228)
Personal Characteristics		
Age	0.00518*** (0.00122)	0.00127*** (0.000141)
Age^2	-6.43e-05*** (1.43e-05)	-2.92e-05*** (1.77e-06)
Dummy of Marital Status		
Married	-0.0784*** (0.0106)	-0.0180*** (0.00107)
Widow and Divorced	-0.110*** (0.0158)	-0.0206*** (0.00193)
Socio-Economic Characteristics		
Number of Dependents	-0.00240** (0.00106)	-0.00429*** (0.000114)
Dummy of Region		
Urban region	0.0846*** (0.00669)	0.0960*** (0.000637)
Dummy of Province		
Punjab	0.0202** (0.00793)	0.0283*** (0.000843)
Sindh	-0.0104 (0.0102)	0.0131*** (0.000930)
Balochistan	-0.0564*** (0.0131)	-0.0331*** (0.00113)
Years Dummy		
1999	-	-0.0847*** (0.00122)
2006	0.0350*** (0.0102)	-0.0749*** (0.00104)
2014	0.0411*** (0.0109)	-0.0564*** (0.00104)
2017	0.0470*** (0.0106)	-0.0535*** (0.00102)
Observations	1,938	199,132
R-squared	0.156	0.166
F-Statistics	29.59* (0.0000)	3037.90* (0.0000)

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

Table A-5 (b): Determinants of Well-being Index for Individuals Involved in Expenditure Saving Market Work

Dependent Variable: Well-being Index	Male	Female
Constant	0.229*** (0.0361)	10.61*** (0.217)
Personal Characteristics		
Age	0.00375* (0.00217)	0.0322** (0.0140)
Age^2	-4.52e-05* (2.64e-05)	-0.000387** (0.000182)
Dummy of Marital Status		
Married	-0.0698*** (0.0178)	-0.0201 (0.0982)
Widow and Divorced	-0.105*** (0.0291)	-0.0428 (0.203)
Socio-Economic Characteristics		
Number of Dependents	-0.000494 (0.00192)	0.0350*** (0.0105)
Dummy of Region		
Urban region	0.105*** (0.0130)	2.286*** (0.0624)
Dummy of Province		
Punjab	0.0315** (0.0142)	0.101 (0.0825)
Sindh	-0.0234 (0.0164)	0.584*** (0.0805)
Balochistan	-0.0460** (0.0193)	0.146 (0.0905)
Years Dummy		
1999	-	-12.03*** (0.106)
2006	0.0750*** (0.0153)	-11.88*** (0.0890)
2014	0.0962*** (0.0182)	-11.89*** (0.0962)
2017	-0.0278 (0.0187)	-11.74*** (0.0906)
Observations	655	98,710
R-squared	0.219	0.212
F-Statistics	15.01* (0.0000)	2045.35* (0.0000)

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

Table A-6 (a): Share of GDP in Household Work

No. of Years	V	T	W	P	V.T.W.P (in millions)	GDP Value (in millions)	% of GDP
1994-95	13,199	37	52	19,126,710	483,827,631,459	1,573,097,000,000	31
1999-00	29,643	48	52	20,995,809	1,318,429,103,791	4,243,393,000,000	42.57
2006-07	51,879	45	52	26,460,306	2,922,404,196,892	8,216,160,000,000	35.57
2014-15	143,183	47	52	30,341,865	9,046,368,107,506	25,168,805,000,000	35.94
2017-18	181,634	48	52	35,588,961	16,134,556,694,316	31,922,302,944,400	43.35
Annual Growth Rate							
10.24%							

Source: Author's own estimation based on different issues of LFS and WDI.

Table A-6 (b): Share of GDP in Household Work by Gender

No. of Years	V_w	T_w	W	Pw	$V_w.T_w.W.P_w$	V_m	T_m	Pm	$V_m.T_m.W.P_m$(in millions)	GDP Value (in millions)	% of GDP contributed by Women	% of GDP contributed by Men
1994-95	13,199	37	52	19,126,710	483,827,631,459	0	0	0	0	1.57×10^{12}	30.76	0
1999-00	25,255	40	52	20,858,394	1,098,954,621,999	4,388	7	137,415	4.64×10^{21}	2.94×10^{12}	37.40	5.17
2006-07	44,335	38	52	26,232,971	2,298,157,351,018	7,544	7	227,335	2.76×10^{22}	8.23×10^{12}	27.97	7.60
2014-15	126,334	41	52	30,176,686	8,178,031,328,101	16,849	6	165,179	$1.36 \text{ X } 10^{23}$	2.51×10^{13}	32.49	3.45
2017-18	157,369	41	52	35,378,012	11,975,982,751,122	24,265	7	210,949	4.29×10^{23}	3.19×10^{13}	37.52	5.84
Annual Growth Rate												
	Male	Female										
	4.28	5.49										

Source: Author's own estimation based on different issues of LFS and WDI.

Table A-7 (a): Share of GDP in Expenditure Saving Market Work

No. of Years	V	T	W	P	V.T.W.P (in millions)	GDP Value (in millions)	% of GDP
1994-95	4,834	13	52	11,137,437	363,006,682,868	1,573,097,000,000	23.08
1999-00	17,308	24	52	12,174,084	1,359,861,389,797	4,243,393,000,000	32.05
2006-07	21,397	18	52	14,625,786	1,617,189,602,385	8,216,160,000,000	19.68
2014-15	45,001	16	52	10,975,582	1,638,300,455,269	25,168,805,000,000	6.51
2017-18	55,827		52	14,553,382	2,918,898,735,083	31,922,302,944,400	9.14
Annual Growth Rate							
-15.09%							

Source: Author's own estimation based on different issues of LFS and WDI.

Table A-7 (b): Share of GDP in Expenditure Saving Market Work by Gender

No. of Years	V_w	T_w	W	P_w	$V_w.T_w.W.P_w$	V_m	T_m	P_m	$V_m.T_m.W.P_m$ (in millions)	GDP Value (in millions)	% of GDP contributed by Women	% of GDP contributed by Men
1994-95	4,834	13	52	11,137,437	363,006,682,868	0	0	0	0	1,573,097,000,000	23.08	0
1999-00	8,870	12	52	12,047,150	691,503,979,503	8,438	12	126,934	8,887,919,402,858,950,000,000	4,243,393,000,000	16.30	15.75
2006-07	10,565	9	52	14,447,029	711,021,561,574	10,832	9	178,757	12,390,481,065,878,900,000,000	8,216,160,000,000	8.65	11.03
2014-15	23,797	8	52	10,903,164	1,079,363,482,682	21,204	7	72,418	11,601,849,179,441,400,000,000	25,168,805,000,000	4.29	2.22
2017-18	27,256	8	52	14,445,605	1,637,907,734,792	28,571	8	107,777	40,348,943,607,207,500,000,000	31,922,302,944,400	5.13	4.01
	Annual Growth Rate											
	Male	Female										
	-24.84%	-19.44%										

Source: Author's own estimation based on different issues of LFS and WDI.