

Access to ICT as Moderating Factor to Women's Participation in the Labor Force: A Conceptual Framework

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Abstract—This study focuses on the development of the conceptual framework explaining the participation of women in the labor market with a particular interest on the role of Information Communication and Technology (ICT). Various studies have found that women's participation in the labor market can be triggered by the many factors. Almost all studies stated that the involvement of women in the labor force normally is associated with economic, socio-demographic and cultural factors. In this technological age, there is a notion that the ICT also plays an important role in determining a woman's decision to work. ICT enables workers to do their job more efficiently, saving both time and monetary costs. ICT may contribute to women participation in the labor market through provision of better access to job market information. In addition it provides women with greater flexibility by allowing them to work from home. For an organization, the monitoring system for the efficient ICT infrastructure and high accessibility, may allow women doing her job at home. Nonetheless there are challenges remain to be addressed particularly in the case of Malaysia as a great disparity in the accessibility of ICT, especially in rural areas.

Index Terms—Access to ICT, moderating factor, women, participation, labor force.

I. INTRODUCTION

Labor is a very important factor in production. If production is still to be done, insufficient amount of labor in the country will lead to dependence on foreign labor. Therefore, each country generally will maximize the use of domestic labor. However, lower labor force participation is not a new issue at the global level as well as in Malaysia. Most notably are the issue of women's labor force participation rate in Malaysia has never exceeded 50 percent since independence.

If more women work, salary or income actually earned by the women will not only improve the lives of families, but also will increase the gross domestic product for the country [1]. Next, if women are not working, expenses incurred to finance education is not getting a positive return for the learning process in schools and institutions of higher education, just to "consumption" instead of "investment" [2]. Besides, in terms of government spending in the annual

budget, there is an increasing expense to give additional training for graduates who are not working and financial assistance to single mothers to engage in economic activity [3], [4].

Back to the issue of women's participation in the labor force, there are many reasons explaining women's decisions to participate in the labor market [5]–[19]. Even though the issue of women's participation in the labor force is not new, this paper seeks to introduce a new element that is the role of ICT.

II. SCENARIO OF MALAYSIAN WOMEN PARTICIPATION IN THE LABOR FORCE

To indicate the effort in enhancing women's involvement in every aspect of economic activities, gender as a development focus was first mentioned in the Third Malaysia Plan (1976–1980). This initiative encouraged the active participation of women in economic development and their contribution to the economy. In the Sixth Malaysia Plan (1991–1995), a full chapter has been devoted to policies and programs that promote women in development. The inclusion of a chapter on women in the long-term development plans was a direct outcome of the National Policy on Women formulated in 1989.

Accordingly, many actions have been taken to encourage family-friendly workplace practices, including flexible working arrangements, community childcare and nursery centers, child subsidy, tax exemption for employers to establish child care centers and paternity leave, and retraining opportunities to boost women's labor force participation so that women can better balance their work, childcare, and household duties [20].

In 1957, male labor force participation rate is 90.0 percent and female labor force participation rate is 30.8 percent [21]. To bridge the gap, many training programs have been established. However, the participation of women in the labor force still limited due to cultural, attitudinal, qualification, situational and institutional barriers [22].

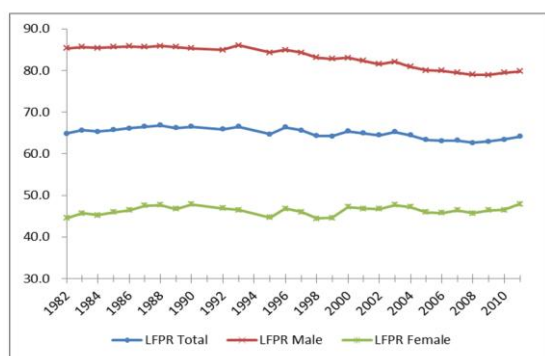
Fig. 1 shows the Labor Force Participation Rate in Malaysia for the period 1982–2011. What can be observed, male participation rate for 1982 was 85.3 percent and the female participation rate was 44.5 percent. In year 2011, male participation rate has declined to 79.8 percent but female participation rate rise to 47.9 percent. The difference between men's and women's aggregate participation rates is 40.8 percentage points in 1982 and 31.9 percentage points in 2011 suggesting that, as men's rates fell and women's rates increased. As the falling participation of men and the rising

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participation of women offset each other, the overall participation did not change much.



Source: Department of Statistics, Malaysia
 Fig. 1. Labor force participation rate 1982-2011 by gender.

Female constitute about half of the total population in Malaysia, thus, it indicates that women also play a very significant role in the economy. However, Malaysia is among the countries in the Asia-Pacific region with the lowest percentage of female workers. As many developed countries such as the United States and the United Kingdom experienced a strong increase in female labor market participation during the 20th century, Malaysian women were still under-represented in the job market. Statistics of Malaysia show that women's participation rate in the labor force was 44.5 percent (1982) and 47.9 per cent (2011), increased only 3.4 percent in 30 years. This growth was too sluggish and participation of women in the labor market was the lowest in ASEAN countries for the year 2010 (refer to Table I), also below the global average of 53 percent and East Asia's rate of 67 percent.

TABLE I: FEMALE LABOR FORCE PARTICIPATION RATE BY ASEAN COUNTRIES, 2010

Countries	Female Participation Rate - 2010 (%)
Cambodia	79.0
Laos	77.0
Myanmar	75.0
Vietnam	73.0
Thailand	64.0
Singapura	57.0
Brunei	56.0
Indonesia	51.0
Filipina	50.0
Malaysia	44.0

Sources : <http://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>

Further, statistics also show that female with tertiary education are the highest contributor to the total female participation rate in the labor force between 1982 and 2011. However, in the job market, the biggest employed female come from a female with secondary educational level. As a result, there is an increase in the unemployment rate for female with tertiary educational attainment. The decreased of participation rate of female belongs to the age group of 35 to 54 years old, suggesting that only a few women remain in the job market until their retirement age. For Malaysia's situation, we can perceive that even with higher educational attainment, women will not necessarily remain in the labor market.

III. FACTORS INFLUENCING WOMEN'S PARTICIPATION IN THE LABOR FORCE

A Theory of the Allocation of Time assumed that leisure time is categorized as normal goods [5]. Thus, for an employee, an increase in the real wage rate will create a tendency to work longer hours and thus result in leisure time becoming relatively more expensive. However, the analysis of labor supply through demand for leisure theory is actually a comprehensive dichotomy [23]. Therefore, it is insufficient to analyze labor force behavior of women in terms of the demand for leisure only.

Reservation wage refers to the lowest wage rate at which an individual chooses to enter the labor market. An individual might set a higher reservation wage when considering an offer of an unpleasant or undesirable job [24]. Therefore, an individual's reservation wage may change over time depending on a number of factors, like changes in the individual's overall wealth, changes in living expenditure and if a person has not worked – the duration of not work. In the case of an individual's overall wealth, household asset, household income and husband's salary could also influence the reservation wage [8].

Conversely, wages is not a strong reason for women to go to work and increase their time in the workplace following an increase in wage. A Theory of Marriage [25], [26], explained that marital status (never married, married, divorced or widowed) give a big impact on women decision to work or not to work. For married women, their marital status will relate to the age of women, women age at first of marriage, birth of child and number of children.

Many new hypotheses regarding various aspects of marriage, divorce, and cohabitation promote a better understanding of the marriage institution. The Economics Of Marriage [10] expand the conventional theory of labor force participation and productivity. This theory emphasized factors affecting women's participation in the labor market which include marital status, spousal help, religiosity, income, education and culture.

Another theory also related to this research is the Theory of Investment in Human Capital. As education is an investment in human capital, thus, as enrollment of women in educational system increase, the participation rate of women in the labor market is expected to be high [27], [28]. Beside women's education, husband's education and close relative's education will also influence women's decision to participate in the labor force.

Most studies conclude that factors affecting women's participation rates in the labor market are varied. Education of women, education of husband and also close relatives, women wage, husband's salary, household income, household asset, birth of child, number of children and household size are among the determinants. As well, other factors such as marital status, women age, women's age at first marriage, location, grandparent's helps, religiosity and ethnicity were also highlighted by previous researchers as factors that influence the participation of women in the labor market. However, these factors may vary among women of the culture [29]–[31].

IV. ACCESSIBILITY OF ICT AS A MODERATING FACTOR

Time changes associated with the development of technology will also contribute to the existence of differences in the women choose to work or otherwise. Malaysians are opening up to the idea of ICT like elsewhere in the world today. Malaysian citizens have begun to experience the reality of the information age, whether they realize it or not. Thus, there are evidences that ICT could encourage more women to join the labor market [32]–[34].

Related to ICT development in Malaysia, in 1994, MIMOS proposed the establishment of the National IT Council. Today, the National Information Technology Council of Malaysia (NITC Malaysia) is the country’s premier organization that strategically manages ICT in the interest of the nation. The Council functions as the primary advisor and consultant to the Government on matters pertaining to ICT in Malaysia’s national development. The National IT Agenda (NITA), launched in December 1996 by NITC provides the foundation and framework for the utilization of ICT to transform Malaysia into a developed nation in our own model consistent with Vision 2020. In accordance with these efforts, the progress of ICT in the late twentieth century has prompted Malaysia to start the industrialization process, and then, the development of a knowledge-based society [35].

According to Dettling (2012), “High-speed Internet access determined home Internet usage increases the labor market participation of married women” [32]. Besides being more efficient working in the office, with high accessibility of ICT, women can also work from home or any other location than the office or project site. Therefore, time can be saved, costs and stress of commuting for employees while helping employers control and often reduce the cost of fixed office space [36].

However, there is a vast difference in internet utilization for people in urban and rural area in Malaysia. For the year 2009, household used on the internet in urban and rural area is different nearly 60 percent. Besides, the broadband penetration rate per 100 households in Malaysia not more than 62 percent. So, how does all these Malaysian women can benefit from the facilities available? If the internet access is low especially in rural areas, it can affect job search and recruitment process be more inefficient for individuals and organizations because they are forced to use traditional methods [37]. In addition, with access to higher ICT, the poor will be able to get access to education, healthcare, government and financial services. ICT also helps small farmers and artisans by connecting them to the market [38]. Therefore, based on today's situation, researchers believe that high accessibility of ICT can offer significant opportunities for women in developing countries, including poor women in rural areas. Sufficient level of ICT infrastructure and high access to ICT in all areas expected will be an important factor that influencing the labor forces participation of women in Malaysia.

Using the internet for job search raises the job finding rate and recruitment process become more efficient [37]. By increasing the level of knowledge and use of ICT, the opportunity to increase other income improved market accessibility and create new jobs. However, sometimes there are some women refused to get themselves equipped with

ICT-related skills. They do not take advantage of ICT-based services that can generate economic opportunities [39]. Besides, the issues of ICT accessibility often deal with the lack of infrastructure, adequate power supply, high cost of computer equipment and telecommunication connectivity [40].

However, their ability to take advantage of these opportunities is dependent on a conducive government policies and environment that allows an increase in the level of education, access to financial assistance and the availability of infrastructure support [41]. The low accessibility of ICT in rural areas makes it difficult to search for information using the Internet, the use of CCTVs as monitoring tools of the employer and exercising all online transactions [33]. Accordingly, apart from seeing the extent of ICT accessibility affects the rate of female participation in the labor force, this study will try to find out how ICT can help them earn an income and be part of the labor force in Malaysia.

V. CONCEPTUAL FRAMEWORK

As far as the researcher concern, to date, there is a lack of research in Malaysia looking at the factors that cause a woman to choose to work or not. This study is really important and still relevant in order to increase the participation of women in the labor force. We need to know why a woman work and why some do not work, especially among women with tertiary education. In addition, with the technology that connects people to the global world, high accessibility of ICT is expected to help women balance career with married life without neglect either of them.

All determinants that highlight by previous researchers still reasonable to Malaysia’s circumstances and labor market environment. Thus, for this research, factors that influence women participate or not participate in the labor force will be categorized under three main categories; economic factors, socio-demographic factors and cultural factors. Accessibility of ICT will be tested as moderator factor that could encourage more women to be a paid worker in the office and also at home. A hypothesized interaction between factors is shown below in Fig. 2.

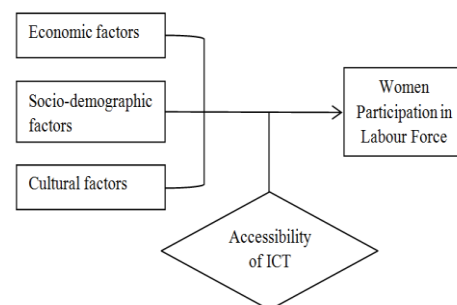


Fig. 2. Conceptual framework

VI. CONCLUSION

Factors affecting participation rates are varied and complex; some are economic variables, socio-demographics and cultural variables. As the ICT has great impacts on

manpower requirements and need, the researcher attempt to prove that accessibility to ICT actually is a moderating factor in the employment status of women in the labor force. Sufficient level of ICT infrastructure, high access to ICT in all areas, high awareness of women to the benefits of ICT and no language barriers to the use of ICT, expected could help more women in Malaysia's labor market.

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REFERENCES

- [1] J. Bryant, V. Jacobsen, M. Bell, and D. Garret, "Labour force participation and GDP in New Zealand," 2004.
- [2] D. A. Olaniyan and T. Okemakinde, "Human capital theory: implications for educational development," *European Journal of Scientific Research*, vol. 24, no. 2, pp. 157–162, 2008.
- [3] Ministry of Finance-Malaysia. (2010). [Online]. Available: www.treasury.gov.my
- [4] Ministry of Finance-Malaysia. 2012. [Online]. Available: www.treasury.gov.my
- [5] G. S. Becker, "A theory of the allocation of time," *The Economic Journal*, vol. 75, no. 299, pp. 493–517, 1965.
- [6] C. D. Long, "The labor force under changing income and employment," *The Canadian Journal of Economics and Political Science*, vol. 27, no. 1, pp. 116–118, 1961.
- [7] T. A. Mahoney, "Factors determining the labor-force participation of married women," *Industrial and Labor Relation Review*, vol. 14, no. 4, pp. 563–577, 1961.
- [8] B. G. Spencer, "Determinant of the labour force participation of married women: A micro-study of Toronto Household," *The Canadian Journal of Economics*, vol. 6, no. 2, pp. 222–238, 1973.
- [9] A. R. Mohamad, "Seminar on economic activities of Women in Malaysia," in *Married Women Labor Force: Testing a Threshold Hypothesis for Peninsular Malaysia*, 1983.
- [10] S. Grossbard, *On the Economics of Marriage: A Theory of Marriage, Labor and Divorce*, Westview Press Boulder, 1993.
- [11] D. Widarti, "Determinants of labour force participation by married women: the case of Jakarta," *Bulletin of Indonesian Economic Studies*, vol. 34, no. 2, pp. 93–120, 1998.
- [12] A. Hafeez and E. Ahmad, "Factors determining the labour force participation decision of educated married women in a district of Punjab," *Pakistan Economic and Social Review*, vol. XL, no. 1, pp. 75–88, 2002.
- [13] A. S. Kalwij and F. Vermeulen, "Labor force participation of the elderly in Europe: The importance of being healthy," 2005.
- [14] R. E. A. Khan and T. Khan, "Labor force participation of married women in Punjab (Pakistan)," *Journal of Economic and Social research*, vol. 11, no. 2, pp. 77–106, 2009.
- [15] M. Z. Faridi, I. S. Chaudry, and M. Anwar, "The socio-economic and demographic determinants of women work participation in Pakistan: evidence from bahawalpul district," *Journal of South Asian Studies*, vol. 24, no. 2, pp. 353–369, 2009.
- [16] J. L. Herr and C. Wolframz, "'Opt-out' rates at motherhood across high-education career paths: selection versus work environment," 2009.
- [17] J. L. Hotchkiss, M. M. Pitts, and M. B. Walker, "Assessing the impact of education and marriage on labor market exit decision of women," February 2010.
- [18] P. Albuquerque and J. Passos, "Grandparents and women's participation in the labor market," 2010.
- [19] T. R. Verena, S. Ummersingh, and Y. Bundhoo, "The power to choose: women and labour market decision in Mauritius," *Journal of Emerging Trend in Economics and Management Science*, vol. 2, no. 3, pp. 193–205, 2011.
- [20] United Nation Development Program (UNDP), "Measuring and monitoring gender equality: Malaysia's gender gap index," 2007.
- [21] S. R. Yahya, "The development process and women's labor force participation - A macro level analysis of pattern and trends 1957-1990," in *Readings On Women and Development in Malaysia*, MPH Group Printing, Kuala Lumpur (republish), 1994, pp. 23–54.
- [22] Ministry of Women and Family Development Malaysia, "Women and the Economy," in *The Progress of Malaysian Women Since Independence 1957 - 2000*, 2003, pp. 55.
- [23] J. Mincer, "Labor force participation of married women: A study of labor supply," in *Aspects of Labor Economics*, vol. I, 1962, pp. 63–106.
- [24] C. R. McConnell, S. L. Brue, and D. A. Macpherson, "The theory of Individual labor supply," in *Contemporary Labor Economics*, Ninth., McGraw-Hill, Irwin, 2010, pp. 32.
- [25] G. S. Becker, "A theory of marriage," in *Economics of the Family: Marriage, Children and Human Capital*, vol. I, 1974, pp. 299–351.
- [26] G. S. Becker, "The Evolution of the Family," in *A Treatise on the family*, Harvard University Press, London, 1993, pp. 342.
- [27] G. S. Becker, "Investment in Human Capital: A Theoretical Analysis," *The Journal of Political Economy*, vol. 70, no. Issue 5, Part 2: Investment in Human Being, Oct., 1962, pp. 9–49, 1962.
- [28] G. S. Becker, *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*, 3rd ed. National Bureau of Economic Research, 1994.
- [29] R. Fernandez, "Cultural change as learning: the evolution of female labor force participation over a century," *American Economic Review*, vol. 103, no. 1, pp. 472–500, 2013.
- [30] A. Orazio, H. Low, and V. S. Marcos, "Explaining changes in female labour supply in life-cycle model," *American Economic Review*, vol. 98, no. 4, pp. 1517–1552, 2008.
- [31] R. Majumder, "Female labour supply in India: proximate determinants," *The Indian Journal of Labour Economics*, vol. 55, no. 3, pp. 393–406, 2012.
- [32] L. J. Dettling, "Opting back in: home internet use and female labor supply," 2012.
- [33] S. Melhem and N. Tandon, "Information and communication technologies for women's socio-economic empowerment," pp. 1–96, 2009.
- [34] V. W. A. Mbarika, F. C. Payton, L. Kvasny, and A. Amadi, "IT education and workforce participation: a new era for women in Kenya?" *The Information Society*, vol. 23, no. 1, pp. 1–18, Jan. 2007.
- [35] T. M. A. Shariffadeen, "Creating ripples in the sea of knowledge: information, communication and innovation in development," in *Malaysia: Policies and Issues*, Institute Strategic and International Studies (ISIS) Malaysia, 2011, pp. 371–394.
- [36] Talent Corporation Malaysia Berhad, "Retaining women in the workforce," 2013.
- [37] E. J. Choi, "Does the internet help the unemployed find jobs?" 2011.
- [38] S. Mehta and M. Kalra, "Information and communication technologies: A bridge for social equity and sustainable development in India," *The International Information & Library Review*, vol. 38, no. 3, pp. 147–160, Sep. 2006.
- [39] World Bank, "Information and Communication Technologies (ICTs), women's enterprises and labor force participation," pp. 1–2, 2006.
- [40] F. S. Sylla, "ICT as an Instrument for Participation: The regional perspective from Africa, examples of the internet use at the grassroots level," October. 2002.
- [41] P. N. Prasad and V. Sreedevi, "Economic empowerment of women through information technology: a case study from an Indian state," *Journal of International Women's Studies*, vol. 8, pp. 107–120, May 2007.



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