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FINANCIAL KUZNETS CURVE, GLOBALISATION AND INCOME DISTRIBUTION: THE ELEMENTS OF TRIPARTITE RELATIONSHIP

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ABSTRACT

This paper reexamines the empirical validity of financial Kuznets hypothesis in terms of looking for functional income distribution and economic globalisation for OECD countries over the 1980-2017 period. In doing so, the current study applies the panel fixed-effects and the system-GMM approaches to show that the estimates are complemented with the traditional assumptions on the financial Kuznets hypothesis. From a functional income distribution perspective, the empirical findings highlight the importance of financial sector development in reducing the income distribution between labor and capital. Also, the paper then provides new evidence on economic globalisation dynamics in exacerbating a more uneven distribution of income. Finally, the empirical findings imply that if any economic unit opens its borders without developing its financial sector, the labor's share accruing in national income would be narrowed on behalf of capital over time.

Keywords:

Labor Share of Income, Financial Kuznets Hypothesis, Financial Sector Development, Economic Globalization

JEL Codes:

D33, F65, F6

FİNANSAL KUZNETS EĞRİSİ, KÜRESELLEŞME VE GELİR DAĞILIMI: ÜÇ PARÇALI İLİŞKİNİN ÖĞELERİ

ÖZ

Bu çalışma, 1980-2017 döneminde OECD ülkeleri için fonksiyonel gelir dağılımı ve ekonomik küreselleşme açısından Finansal Kuznets hipotezinin ampirik geçerliliğini tekrar araştırmaktadır. Bu çerçevede mevcut çalışma, ampirik tahminlerinin, panel sabit etkiler ve sistem-GMM yaklaşımlarını Finansal Kuznets hipotezinin geleneksel varsayımları ile uyum içinde olduğunu göstermek adına uygulamaktadır. Fonksiyonel gelir dağılımı perspektifinden yola çıkarak ampirik bulgular emek ve sermaye arasındaki gelir farkını azaltmada finansal sektör gelişiminin önemine dikkat çekmektedir. Ayrıca çalışma eşit olmayan gelir dağılımını artırmada ekonomik küreselleşme dinamikleri ile ilgili yeni kanıtlar sunmaktadır. Son olarak, ampirik bulgular herhangi bir ekonomik birim finans sektörü gelişimini sağlamadan sınırlarını açarsa emeğin ulusal gelirden elde ettiği payın zaman içerisinde sermaye lehine daralacağını göstermektedir.

Anahtar Kelimeler:

Emek Gelir Payı, Finansal Kuznets Hipotezi, Finansal Sektör Gelişmesi, Ekonomik Küreselleşme

JEL Kodları:

D33, F65, F6

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1. INTRODUCTION

A bulk of studies on the relationship between financial development and income distribution has found different sources of reasons for explaining the primary element of influencing channels of finance that vary the income levels of various social segments. However, there is still no consensus on the factors, dimensions, and the directions of the finance-distribution nexus in the related literature. In addition to that misleading context, few of the studies were integrated the globalisation phenomena, including both economic, social, and political spheres, into their analytical structure which might have a crucial indirect impact on income distribution by way of altering the financial motives. In that sense, the significant difference of this paper from the literature depends on the fact that it corporates the factors related to the economic globalisation into the analysis separately and thus uses a bit of different indicator to account for effects of finance – namely the financial Kuznets curve – on income distribution: the square term of financial development, including financial market development and financial institutions development in terms of depth, access, efficiency. Therefore, it is obvious to argue that the examination of current development in the financial sector within the frontiers of the financial Kuznets curve is rare.

The traditional wisdom is initiated to show that the presence of financial Kuznets curve needs to be an emergence of an inverted U-curved correlation for the relationship between financial sector development and income inequality (as substantially measured with Gini coefficient). For instance, three seminal papers complement each other from different perspectives to set out the pros and cons of finance-inequality nexus, which may evolve in time. According to Banerjee&Newman (1993) and Galor&Zeira (1993), providing a higher level of development in finance significantly leads to a lower level of income inequality among different social classes. However, Greenwood&Jovanovic (1990) introduces the time effects of this nexus and thus state that there is an inverted U-shaped relationship between financial sector development and income inequality which indicate that the former period of financial development process brings out the deterioration of income distribution. However, in the latter period, the individual level of financial development is reached for most of

the countries where the income starts to distribute more equally in the presence of several socio-economic factors among different social segments.

These kinds of vanguard discussions on the finance-inequality nexus were also supported by the other empirical findings but were also criticised based on differentiated and globalised social, political, and economic structures of many countries over time. Therefore, a piece of empirical findings provided by those newly updated studies reveals that the inverted U-shaped relationship between financial sector development and income inequality can alter due to several reasons. First, Jaumotte et al. (2008) point out the severe adverse effects of technical progress in the production system and globalised economic relations on equal distribution of total income and then estimate the statistical correlation between financial sector development and income inequality in which they found a positive relationship among the two. However, one crucial deficiency of their analysis depends on the fact that the financial development is estimated through only the financial market depth indicator: the ratio of credit to the private sector by deposit money banks and other financial institutions to GDP. Therefore, the other significant variables to account for the effects of the measures of financial access and efficiency on income inequality are substantially excluded from the current analysis by way of providing one-side evidence for the given nexus. Second, Kappel (2010) validates the empirical findings of both Banerjee&Newman (1993) and Galor&Zeira (1993) related to the negative correlation between financial sector development and income inequality across the countries. However, similar to the same technical problem that Jaumotte et al. (2008) did in their empirical analysis, Kappel (2010) goes through using only one variable to estimate the correlation for finance-inequality nexus. Third, Nikoloski (2012) finds that an inverted U-curve relationship between financial sector development and income inequality is theoretically and statistically significant for selected countries and thus agrees to the empirical findings of Greenwood&Jovanovic (1990). Although Nikoloski (2012) confirms that an inverted U-curve relationship is valid for finance-inequality nexus, the one-side implementation for measuring the financial sector development by way of using only one variable which is a credit to private sector restricts his research to generalise of a given theoretical framework for broader analyses. In that

vein, it is possible to argue that including additional variables or using proxy variables to estimate financial sector development may have inverse effects on potential findings that Nikoloski (2012) puts forward on finance-inequality nexus. Finally, the empirical findings that Tan&Law (2012) and Jauch&Watzka (2016) approves by arguing that finance-inequality nexus is U-curved. While Tan&Law (2012) validate the U-curve relationship between financial sector development and income inequality for selected developing countries, Jauch&Watzka (2016) include the selected low-income countries.

The significant difference of this paper from those other studies are based on the selection of measurement for financial sector development and the selection of sample countries. Besides, this paper extends their findings by including the globalisation parameters as another channel of influence and investigates their effects on income distribution by originating an interaction variable between financial sector development and globalisation indicators. Moreover, this paper estimates the income inequality by accounting for contradictions emerging in the production process. Therefore, it allows for the estimation of income distribution between capital and labor, not among households[2].

The sample of this study is based on the selected OECD countries[3] in which the income levels of those countries to a large extent vary depending on several factors. However, these differences across countries are critical for two reasons where it is worth implementing that the finance-inequality nexus can be altered in the presence of conflicting interests between capital and labor. First, a growing divergence of the redistribution of income towards more to capital in different economies can be examined using various indicators covering economic, social, and financial factors either for short- and long-run periods. Second, specific to the financial sector, many of the potential time-based effects of the development process for financial markets and institutions on income distribution can be investigated through the classification of various countries based on their economic positions in comparison with other

[2] Details on data will be given in data description section.
[3] The list of countries using the empirical analysis can be ranged as follows: Australia, Belgium, Canada, Chile, Denmark, Finland, France, Germany, Israel, Italy, Japan, Netherlands, Norway, South Korea, Spain, Sweden, United Kingdom, United States.

countries.

Although the literature on the relationship between financial sector development and income inequality has different empirical outcomes, the investigation of this nexus based on the financial Kuznets curve is rare. In particular, several studies have benefited from a much narrower data set to estimate the financial sector development. For instance, the private credit over GDP is used as a proxy variable to account for the financial sector development. In that sense, many of these papers get rid of explaining the direct and indirect effects of institutional differences in finance on income inequality. In other words, they mainly focus on market-based ingredients of finance which leads to emerging in the following conditions: First, the human capital should be considered as one of the most crucial determinants to achieve a higher level of financial development in line with potential needs to financial credits. Second, the level of investment can be increased by providing new opportunities to households by way of altering the conditions in the financial sector. Rajan (2010), for instance, dwells upon the political context of redistributive taxation to allow for explaining the current changes in finance-inequality nexus. In this sense, the findings of the study reveal that political factors are positively correlated with the financial sector development, and thus they increase income inequality. This concluding remark is also assigned to explain the fact that the conventional analogies of redistributive taxation methods are not benefited by different social segments due to political inabilities. Specific to the American households, the concluding remarks of his study state that politicians can elicit new ways for low-income groups to access financial credits. On the other hand, Haan&Sturm (2017) and Bumann&Lensink (2016) argue that the effects of financial liberalisation together with an increasing degree of economic globalisation on income inequality are conditioned by the level of financial development. Their empirical findings indicate that the alternative channels and proxy indicators should be integrated into the analysis to account for the relationship between financial development and income inequality.

Within the context of three seminal studies on finance-inequality nexus, some significant differences in the theoretical framework should be separated from each other to make a further analysis based on financial Kuznets hypothesis. For instance,

Galor&Zeira (1993) investigate the statistical significance of the effects of human capital investment in consideration of financial credit on income inequality. However, Banerjee&Newman (1993) examine the two-way correlation between households' occupational choice dependency and credit availability. Also, Greenwood&Jovanovic (1990) integrates the financial intermediation process into the case of increasing level of household capital income and thus the portfolio choice by households. First, the low group of households cannot be able to get financial resources in the early stages of economic development which are necessary for their social and economic needs. The primary reason behind this lack of financial sources for the vulnerable and lowest-income segment of households depends on two factors: (i) under-developed financial sector and (ii) the low level of economic growth. In that sense, the banking sources using in different fields can be substantially obtained by the upper-income segment of households. Therefore, this early stage of economic development produces the fact that an increase in the level of financial development leads to a higher level of income inequality. However, as the economic conditions develop the low group of households become much wealthier depending on different conditions in which then they can afford to use financial resources and capital. According to this given context, the extreme disparity of income distribution with a high concentration of income in the hands of a small percentage of a population becomes narrower over time. It thus results in a decline in the level of income inequality, which is parallel to an increasing level of economic development.

The main objective of this paper is to show that the class-based findings can be obtained in a similar pattern if the theoretical limits extend with the inclusion of both financial markets and institutions into the analysis in the control of various variables such as economic globalisation, bargaining power of labor and macroeconomic structures. In other words, the extension of current results can be statistically validated in terms of functional income distribution perspective in which a higher level of financial development can narrow the income divide between capital and labor. Therefore, this paper also extends the analytical framework by looking at the production-based division of income between capital and labor. All in all, the empirical outputs of this study will be based on the argument that the traditional

knowledge and acceptance for the inverted U-shaped relationship between financial development and income inequality can also be significant under the functional income distribution perspective. Therefore, the inclusion of heterogenous characteristics of individuals into the analysis based on their skills and job positions in the production process can lead us to find an inverted U-shaped relationship of the financial Kuznets curve. Following this context, three hypotheses on finance-inequality nexus emerge in which they will be tested in the empirical section:

Hypothesis 1

There is a long-run positive relationship between the labor share of income and financial sector development.

Hypothesis 2

The interaction variable between financial sector development and economic globalisation is negatively correlated with the labor share of income in the early phases of economic development, but it turns into positive in the latter periods.

Hypothesis 3

There is an inverted U-shaped relationship between the labor share of income and financial sector development.

Based on these hypotheses, the study investigates the endogenous relationship between financial sector development and labor share of income approaching a panel fixed-effects model and Generalised Methods of Moments (GMM) for selected countries[4] from the OECD region covering the 1980-2017 period. In that sense, the empirical approach is grounded on within-country developments of income dispersion between capital and labor in terms of financial Kuznets hypothesis. The primary rationale behind the use of panel fixed-effects technique is to remove the country-specific effects from the estimation and to adjust the correlation with the explanatory variables. Moreover, since the panel fixed-effects method does not correct the endogeneity problem, the study approaches the GMM procedure to get rid of the

[4] The major rationale in selection of the countries from the OECD region is based on the availability of the data for labor share of income and is based on making the analysis on balanced data model covering for all variables.

omitted variable bias and/or reverse causality.

Yearly data of labor share of income is used as the dependent variable, which is obtained from the Penn World Tables version 9.1 database (Feenstra et al., 2015). As an indicator for financial sector development, including both financial markets and institutions, based on the International Monetary Fund (IMF) data, the study finds that the labor's income share decreases with a higher level of development in the early phases of financial and economic conditions but then increases in the latter period. Depending on this rationale, the paper empirically validates the theoretical underpinnings provided by Greenwood&Jovanovic (1990) in which they show that there is an inverted U-curve relationship between financial sector development and income inequality. The remainder of the paper is structured as follows. Section 2 provides the details of model and data. Section 3 explains the empirical results for both the panel fixed-effects method and the GMM procedure. Section 4 presents the concluding remarks.

2. DATA AND EMPIRICAL METHODOLOGY

One of the most critical knowledge to estimate the time-based effects of financial sector development on the income divide between capital and labor depends mostly on the selection procedure of the data for financial sector development. In that sense, to estimate the effect of financial sector development on the labor share of income, the paper employs the data obtaining from the IMF database. The primary reason to use the IMF database for financial sector development is based on the fact that the multiple effects of finance-led sub-indices for financial markets, financial institutions, and overall development, covering depth, access, and efficiency on income distribution can be discovered to a large extent. Therefore, considering the limitations of estimation for the financial sector development data where a bulk of studies employ the credit ratio over GDP, the use of the multidimensional structure of IMF data on financial sector development thus provides the difference of this study from than that of the traditional literature on financial Kuznets hypothesis. Furthermore, the various characteristics of the data for financial sector development provide a way to classify the selected countries from the OECD region in terms of their financial structure regarding the

differences in financial markets and financial institutions. For instance, Svirydzenka (2016: 4) states that the constellation of financial markets and financial institutions facilitates the provision of financial services. Therefore, more emphasis on only one field of finance such as depth and thus ignoring the access and efficiency of financial relations provide a partial understanding of the relationship between financial sector development and income distribution. Since the countries in the OECD region are classified as developed and developing economies, their financial system is in no small extent led us to include efficiency and access indices as well as the depth index for the financial sector development. In other words, as Čihák et al. (2012) and Aizenman et al. (2015) rightfully argue that the diversifying financial structures across the nations necessarily compel researches to analyze finance-inequality nexus by integrating various indicators into their measurement related to the financial sector development. In consideration of that issue, this study includes the data for financial sector development which consists of both depth, access, and efficiency components for financial markets and financial institutions. On average, the data is measured as index ranging between 0 (i.e., thoroughly underdeveloped) and 100 (i.e., fully developed). In that vein, the empirical analysis is grounded on the estimation of the effects of overall financial sector development, including both financial markets and financial institutions, as well as the sub-components on the income distribution, measuring as the labor share of income.

Regarding the financial Kuznets hypothesis, the literature is insufficient in the case of analyzing the correlation of the variables mentioned above with the income distribution. In that vein, the paper benefits from additional proxy variables to measure the effects of financial development on income distribution and thus gets rid of from the limitation of one-side analysis by way of using only financial sector depth variable (i.e., private credit by deposit money banks to GDP) to estimate the effects of financial sector development on income inequality. Also, the paper differs from those studies since it integrates the socio-economic logic into the analytical framework by way of using the labor share of income in contrast to the GINI index and hence widens the theoretical implications.

Besides the financial sector development index, the study also includes the

economic globalisation index produced by Gygli et al. (2019) to measure the effects of both financial and trade openness as well as the FDI flows on the income distribution. The so-called KOF Globalization index, including the data for economic globalisation, measures the different dimensions of liberalisation policies in finance and trade. However, the paper does not only belong to the economic globalisation index and thereby alternatively measures the effects of sub-components on the labor share of income. First, it employs the effects of openness in trade on income distribution, which is called as real trade openness since it is estimated by the total of exports and imports divided by GDP and then is adjusted from the price of GDP. Second, to estimate the effect of financial openness on income distribution the paper employs a *de jure* measure of financial liberalisation produced by Chinn&Ito (2006), which is based on the binary dummy variables that codify the list of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Therefore, the data for financial openness differs from the other related variables based on measuring financial liberalisation since it collects information for capital mobility from AREAER to incorporate the extent and intensity of capital controls. A *de jure* characteristic of this variable also cannot lead to higher cross-border transactions even though the limitations on economic transactions substantially become lower for domestic capital and foreign capital.

Besides, the dependent variable that the paper uses in the empirical analysis is the labor share of income. In particular, the labor's share is measured as the compensation of employees over GDP. In that vein, the residual part is called the capital share. While the methodological background does not have any common sense, each measurement technique has its drawbacks. For instance, the use of an unadjusted indicator of labor's share may bias over time if it excludes the self-employment problem (Krueger, 1999; Gollin, 2002).

Moreover, the data is mostly obtained from the formal sector, and thus the data from the informal sector is not accounted for in the empirical part, which then reports the labor share of income either more or less (Jayadev, 2007: 426). To correct this technical issue, the earnings of self-employed are led to involve in the data. Considering this particular problem, the data for labor's share is taken from Penn

World Tables (PWT) version 9.1, which is regarded as an adjusted labor share of income. While the numerator of compensation of workers includes both dependent and self-employed labor, the denominator of GDP excludes net indirect taxes. Figure 1 represents the trends of measures covering both indices for financial sector development and labor share of income across the selected countries from the OECD region. While the right-side indicates the variables for financial sector development, the left-side depicts the change in the labor share of income accruing from GDP over time.

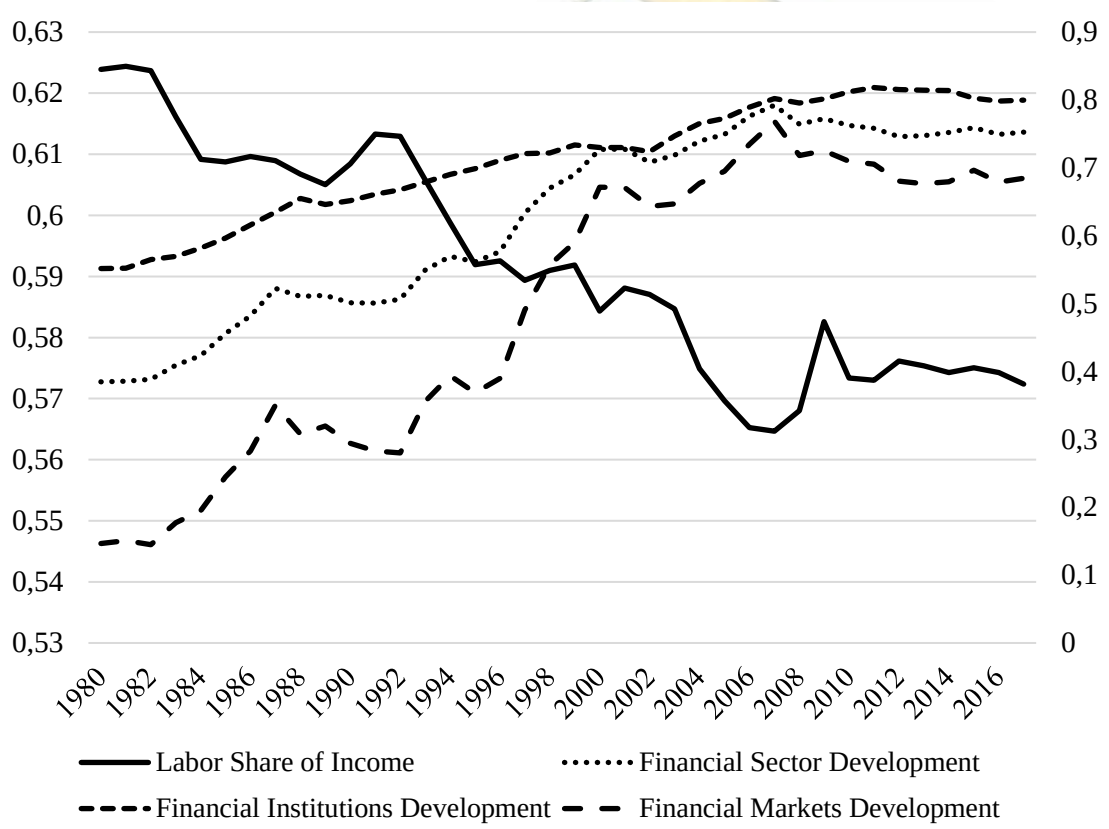

Figure 1. Trends in Labor Share of Income and Financial Sector Development

Source: Penn World Tables 9.1; IMF Data

Using panel data from 1980 to 2017, on the one hand, the study is estimated within-country relationship between financial sector development and labor share of income by way of employing fixed-effects method developed by Driscoll and Kraay (1998) to produce robust standard error estimator; on the other hand, GMM estimator is used to testing dynamic fluctuations and to control endogeneity problem. In that context, the hypotheses of the study are estimated by Equation (1) for the panel fixed-

effects model:

$$LABSH_{it} = \alpha_i + \beta_1 FD_{it} + \beta_2 FD_{it}^2 + \beta_3 EC_{it} + \beta_4 EC_{it}^2 + \beta_5 FD * EC_{it} + \beta_6 (FD * EC)_{it}^2 + \beta_j X_{it} + \theta_t + \mu_i + \varepsilon_{it} \quad (1)$$

Moreover, the dynamic changes and potential endogeneity problem are tested by Equation (2) for GMM technique:

$$\Delta LABSH_{it} = \beta_k \Delta LABSH_{it-k} + \beta_1 \Delta FD_{it-k} + \beta_2 \Delta FD_{it}^2 + \beta_3 \Delta EC_{it} + \beta_4 \Delta EC_{it}^2 + \beta_5 \Delta FD * EC_{it} + \beta_6 \Delta (FD * EC)_{it}^2 + \beta_j \Delta X'_{it-k} + \Delta \theta_t + \Delta \varepsilon_{it} \quad (2)$$

Where LABSH is the labor share of income, FD includes all financial sector development indices, FD^2 represents the square term of FD, EC is the economic globalisation index, EC^2 is the square term of EC, FD*EC is the interaction term between financial sector development indices and economic globalisation index, $(FD*EC)^2$ is the square term of FD*EC, X is a vector of control variables covering labor force participation rate, GDP per capita, financial openness, real trade openness, total factor productivity index, human capital index, and the government share (% of GDP). Following the hypothesis 1 of a linear positive effect of financial sector development on the labor share of income over time, β_1 should be harmful, and β_2 should be positive in which both coefficients are statistically significant. According to an inverted U-shaped financial Kuznets hypothesis, all other control variables, including macroeconomic and structural indicators, have to be potential effects on given correlations. In that sense, the paper uses various control and proxy variables to statistically show that the traditional wisdom for an inverted U-shaped financial Kuznets hypothesis is still valid in some circumstances that lead to a change in the socio-economic structure of the finance-inequality nexus. For instance, following the other hypotheses, the empirical outcomes are based on the findings where β_3 and β_4 are expected to be positive and negative, respectively. Also, the coefficients of FD*EC and $(FD*EC)^2$ – namely β_5 and β_6 – are expected to be negative and positive, respectively. All these *ex-ante* statistical representations are complemented to the findings of traditional knowledge on the financial Kuznets hypothesis.

However, the paper does not move away from the previous studies and their

theoretical context and thus uses a similar methodological structure with various control and proxy variables. Employing our database for the estimation of the relationship between financial sector development and income distribution, the empirical results *a priori* lead us to state that the effects of core variables such as FD, FD2, EC, EC2, FD*EC, and $(FD*EC)^2$ on the labor share of income are statistically significant, which are similar to the mainstream knowledge on financial Kuznets hypothesis in both theoretical and analytical contexts. Table A1 represents the sources of data, and Table A2 presents the descriptive statistics in the Appendix.

3. EMPIRICAL FINDINGS

This sub-section divides into two separate parts to correct practical problems that may emerge in the analytical structure. First, the paper deals with the estimation of panel fixed-effects panel data method in which the model parameters are fixed or non-random quantities. Second, the paper considers the dynamic fluctuations and tests the endogeneity problem. In that sense, each estimation method complements their theoretical deficiencies to obtain coefficients which are statistically significant and to acquire robust estimates.

3.1. Empirical Results for Panel Fixed-Effects Method

The empirical results for the panel fixed-effects method are divided into three parts which are represented in Tables 1, 2, and 3 for the baseline results of using overall financial sector development index, financial institutions index, and financial markets index, respectively. In each model, the study alternatively uses indices on financial sector development to estimate whether there is a correlation with the labor share of income. The testing procedure for this relationship, the panel data fixed-effect method is based on producing a within estimator. Since the indices for financial sector development may have differential effects on the labor share of income in terms of both financial institutions and financial markets, the division between these indicators may also provide us with a piece of information for which financial components has a strong effect on income distribution between labor and capital. Also, adding these additional variables for financial sector development also leads us to check the contending and complementing points of this study from the other bulk of mainstream

studies.

Regarding the distinction of financial sector development indices to separately check their effects on the labor share of income, the study initially launches into the overall financial sector development data to control its correlation with the other variables, which is represented in Table 1. The same modelling structure is also followed in Tables 2 and 3 for financial institutions and financial markets variables, respectively. All of the empirical outputs lead us to argue that the measures on financial sector development narrow the income divide on behalf of workers by increasing the labor share income accruing in total national income in the latter periods of economic development but widens in the infant periods as well, irrespective of whether the indices for financial sector development are included separately. Indeed, these empirical findings comply with the theoretical arguments provided by Greenwood&Jovanovic (1990), Banerjee&Newman (1993), and Galor&Zeira (1993). Some significant reasons for approving an inverted U-shaped financial Kuznets hypothesis can be ranged as follows: (i) the degree of economic development, (ii) the differential positions of workers in terms of their bargaining power over the capital, (iii) the level differences in economic globalisation, and (iv) the role of government in the economic system.

Related to the factors mentioned above, Models 1 and 2 consider the benchmark effects of financial sector development indices on the labor share of income by excluding the control variables. The empirical results of these two models show that there is a high correlation between financial sector development indices and labor share of income where the labor's share decreases in the initial period of economic development but increases in the latter stages, within the contexts of the effects of finance variables. However, the results are not the same for economic globalisation index and its square term, representing in Models 3 and 4, respectively. Though the first period effects of economic globalisation on labor's share are positive, the other period effects turn into damaging. Since these empirical outputs for economic globalisation are partially explained the whole story, the inclusion of control variables leads these finding to be statistically insignificant. In Model 5, the empirical investigation is included the total factor productivity index with its square term to test

the time-based effects of technological progress on the labor share of income. The results imply that technological improvement has a positive impact on labor's share due to its positive effect on production per unit in which workers earn extra revenue from an additional output over time. However, this case has its limits since wealth ownership is assumed as given. Therefore, each policy change based on the distribution of wealth may have a potential effect on labor's share, along with a change in technological progress. In Model 6, the empirical investigation tests the validity of the traditional Kuznets hypothesis by including the GDP per capita variable measured in the logarithmic scale where the empirical findings contradict with the mainstream knowledge. In other words, the empirical results indicate that the initial period of economic development has a positive impact on labor's share, but the latter stages of economic development are negatively correlated with the labor share of income. Therefore, the implication of various variables states that financial sector development is possibly conditioned on different factors. In that vein, the study also includes other control variables into the empirical analysis to test the skill-based effects of employees that may change the intra-class distribution among workers. To estimate the skill-based effects of employees on income distribution, the human capital index is included in the empirical analysis in Model 7. The findings show that increasing the degree of human capital reduces the intra-class inequality based on income distribution among workers. However, these empirical implications hold for overall financial sector development and financial markets indices, not for financial institutions index. In Model 8, the empirical analysis also considers the bargaining power measures of workers by including the interaction term between human capital index and the labor force participation rate (%) which of this variable may have potential effects on the bargaining position of labor against the capital. The primary reason to generate this interaction term due to show that the only way of getting rid of intra-class inequality of the level of income is to increase the labor force participation rate in parallel to an increase in social skills, experiences, and all of the knowledge. In other words, if any increase in labor force participation rate (%) accompanies an increase in human capital, it reduces the intra-class inequality of the level of income and thereby increases the labor's share.

Table 1. Panel Fixed Effects Estimation Results

(Baseline Variable: Overall Financial Sector Development)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fin_Dev	-0.111***	-0.194***	-0.113***	-0.099**	-0.078*	-0.089*	-0.141**	-0.108*	-0.088	
	(0.006)	(0.038)	(0.040)	(0.042)	(0.041)	(0.049)	(0.056)	(0.057)	(0.068)	
Fin_Dev^2		0.070**	0.058**	0.050**	0.044*	0.078**	0.112**	0.094**	0.057	
		(0.031)	(0.025)	(0.025)	(0.025)	(0.033)	(0.044)	(0.045)	(0.055)	
Econ_Glob			-0.132***	-0.049	0.002	-0.046	-0.047	-0.037		
			(0.028)	(0.059)	(0.054)	(0.065)	(0.086)	(0.078)		
Econ_Glob^2				-0.073	-0.115**	-0.052	-0.055	-0.061		
				(0.052)	(0.051)	(0.064)	(0.081)	(0.072)		
Fin_Dev*Econ_Glob										-0.209***
										(0.021)
(Fin_Dev*Econ_Glob)^2										0.170***
										(0.030)
Fin_Open									-0.003*	
									(0.002)	
Real_Trade_Open									-0.012*	
									(0.007)	
Human_Cap							0.034**			
							(0.016)			
Gov_Share							-0.055	-0.048	-0.034	-0.017
							(0.090)	(0.097)	(0.107)	(0.079)
TFP					-0.470***	-0.504***	-0.542***	-0.477***	-0.427***	-0.397**
					(0.147)	(0.159)	(0.129)	(0.147)	(0.152)	(0.151)
TFP^2					0.244***	0.283***	0.308***	0.267***	0.237***	0.215**
					(0.084)	(0.090)	(0.071)	(0.083)	(0.084)	(0.085)
Log(GDPperCap)						0.511***	0.579***	0.475***	0.417**	0.371*
						(0.149)	(0.182)	(0.166)	(0.157)	(0.191)
Log(GDPperCap)^2						-0.068***	-0.082***	-0.064***	-0.060***	-0.049**
						(0.019)	(0.023)	(0.021)	(0.020)	(0.024)
Human_Cap*Labor_Force								-0.000	0.000	-0.000
								(0.000)	(0.000)	(0.000)
Constant	0.662***	0.683***	0.726***	0.699***	0.899***	-0.016	-0.114	0.057	0.155	0.161
	(0.004)	(0.011)	(0.008)	(0.017)	(0.062)	(0.256)	(0.347)	(0.313)	(0.266)	(0.352)
Within R-squared	0.3609	0.3667	0.4075	0.4090	0.4238	0.4406	0.4483	0.4419	0.4296	0.4383
No. of obs.	684	684	684	684	684	684	684	684	684	684
No. of countries	18	18	18	18	18	18	18	18	18	18

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%. Robust standard errors are in parentheses.

The results show that the coefficient of interaction term of human capital index and labor force participation rate is substantially positively correlated with the labor share of income, but it is statistically insignificant. Model 9 includes the proxy variables (i.e., financial openness and real trade openness) for the economic globalisation index. Similar to the significant characteristics of the economic globalisation index in the empirical models, the proxy variables complement this case in different structures in terms of their effects on income distribution. Both the coefficients of real trade openness and financial openness are negatively correlated with the labor's share. Finally, Model 10 includes the interaction term of financial sector development indices and economic globalisation to test whether financial sector development is conditioned to a globalised economic structure. The empirical results show that the initial period of interaction term of financial sector development and economic globalisation index is negatively correlated with the labor share of income,

but the latter stages of economic development it turns into positive. It means that the conditional structure between the interaction term has positively influential on income distribution if any economic unit opens its economic borders along with the development of its financial sector. In other words, the economic globalisation process of any country should follow the financial sector development over time.

Table 2. Panel Fixed Effects Estimation Results
(Baseline Variable: Financial Institutions Variable)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fin_Inst	-0.103***	-0.070***	-0.023**	-0.025***	-0.026***	-0.004	-0.000	-0.004	-0.006	
	(0.016)	(0.016)	(0.009)	(0.009)	(0.008)	(0.007)	(0.010)	(0.009)	(0.011)	
Fin_Inst^2		-0.042***	0.057***	0.058***	0.073***	0.079***	0.078***	0.081***	0.073***	
		(0.007)	(0.007)	(0.007)	(0.008)	(0.009)	(0.008)	(0.007)	(0.012)	
Econ_Glob			-0.239***	-0.055	-0.006	-0.023	-0.044	-0.046		
			(0.022)	(0.056)	(0.048)	(0.062)	(0.086)	(0.087)		
Econ_Glob^2				-0.148***	-0.176***	-0.110*	-0.093	-0.092		
				(0.048)	(0.041)	(0.057)	(0.076)	(0.075)		
Fin_Inst*Econ_Glob										-0.217***
										(0.038)
(Fin_Inst*Econ_Glob)^2										0.228***
										(0.048)
Fin_Open									-0.008***	
									(0.001)	
Real_Trade_Open									-0.009	
									(0.007)	
Human_Cap							0.005			
							(0.015)			
Gov_Share							0.036	0.033	-0.006	-0.007
							(0.079)	(0.080)	(0.084)	(0.077)
TFP					-0.661***	-0.538***	-0.577***	-0.570***	-0.582***	-0.402**
					(0.123)	(0.138)	(0.126)	(0.133)	(0.136)	(0.154)
TFP^2					0.340***	0.305***	0.329***	0.322***	0.322***	0.230**
					(0.069)	(0.076)	(0.067)	(0.071)	(0.072)	(0.085)
Log(GDPperCap)						0.419***	0.494**	0.462**	0.630***	0.878***
						(0.134)	(0.227)	(0.211)	(0.167)	(0.191)
Log(GDPperCap)^2						-0.061***	-0.071**	-0.066**	-0.092***	-0.118***
						(0.017)	(0.029)	(0.026)	(0.022)	(0.024)
Human_Cap*Labor_Force								-0.000	0.000	0.000
								(0.000)	(0.000)	(0.000)
Constant	0.665***	0.662***	0.741***	0.687***	0.979***	0.220	0.081	0.137	-0.146	-0.746*
	(0.012)	(0.010)	(0.011)	(0.020)	(0.055)	(0.247)	(0.447)	(0.411)	(0.310)	(0.381)
Within R-squared	0.1904	0.2040	0.4088	0.4159	0.4474	0.4741	0.4751	0.4752	0.4572	0.4240
No. of obs.	684	684	684	684	684	684	684	684	684	684
No. of countries	18	18	18	18	18	18	18	18	18	18

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%. Robust standard errors are in parentheses.

Overall, the statistical outcomes by way of analysing the finance-inequality nexus through the use of two sub-components (i.e., financial institutions and financial markets) show that financial institutions development variable provides more robust results in Table 2 than the overall financial sector development variable engaged in Table 1, in terms of the validity of financial Kuznets hypothesis. This can be also stated by the comparison of the coefficients among financial markets and overall financial sector development, respectively. In other words, the validity of the financial Kuznets hypothesis becomes more viable when the sub-components of the overall financial

sector development variable are integrated into the analysis separately. Also, Table 2 shows that the empirical results for the economic globalisation index provide more robust and statistically significant outcomes. In particular, the latter periods of economic globalisation harm a socio-economic structure to a large extent by widening the income gap between labor and capital. Therefore, pro-globalised arguments based on the economic field is not statistically validated in terms of this structure.

Table 3. Panel Fixed Effects Estimation Results
(Baseline Variable: Financial Markets Variable)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Fin_Mar	-0.078***	-0.142***	-0.104***	-0.106***	-0.105***	-0.099***	-0.114***	-0.098***	-0.088***	
	(0.004)	(0.011)	(0.019)	(0.023)	(0.022)	(0.021)	(0.023)	(0.025)	(0.025)	
Fin_Mar^2		0.065***	0.052***	0.054***	0.057***	0.057***	0.071***	0.056**	0.037	
		(0.013)	(0.015)	(0.018)	(0.019)	(0.020)	(0.025)	(0.027)	(0.028)	
Econ_Glob			-0.077***	-0.095	-0.049	-0.041	-0.056	-0.042		
			(0.024)	(0.066)	(0.059)	(0.068)	(0.084)	(0.077)		
Econ_Glob^2				0.016	-0.014	-0.012	-0.007	-0.011		
				(0.061)	(0.054)	(0.062)	(0.075)	(0.069)		
Fin_Mar*Econ_Glob										-0.153***
										(0.026)
(Fin_Mar*Econ_Glob)^2										0.109**
										(0.041)
Fin_Open									-0.003**	
									(0.001)	
Real_Trade_Open									-0.014**	
									(0.005)	
Human_Cap							0.037**			
							(0.015)			
Gov_Share							-0.002	0.003	0.010	0.023
							(0.087)	(0.092)	(0.098)	(0.086)
TFP					-0.460***	-0.425**	-0.524***	-0.427**	-0.409**	-0.374**
					(0.140)	(0.179)	(0.147)	(0.168)	(0.169)	(0.162)
TFP^2					0.239***	0.229**	0.289***	0.230**	0.217**	0.203**
					(0.080)	(0.101)	(0.081)	(0.094)	(0.094)	(0.090)
Log(GDPperCap)						0.107	0.249	0.108	-0.049	0.036
						(0.180)	(0.197)	(0.203)	(0.172)	(0.198)
Log(GDPperCap)^2						-0.016	-0.039	-0.016	0.003	-0.008
						(0.022)	(0.024)	(0.025)	(0.021)	(0.024)
Human_Cap*Labor_Force								-0.000	0.000	-0.000
								(0.000)	(0.000)	(0.000)
Constant	0.630***	0.642***	0.679***	0.684***	0.885***	0.695**	0.465	0.692*	0.970***	0.789**
	(0.002)	(0.003)	(0.011)	(0.020)	(0.062)	(0.294)	(0.353)	(0.355)	(0.291)	(0.342)
Within R-squares	0.4136	0.4280	0.4428	0.4429	0.4576	0.4593	0.4674	0.4593	0.4615	0.4563
No. of obs.	684	684	684	684	684	684	684	684	684	684
No. of countries	18	18	18	18	18	18	18	18	18	18

Notes: *** significant at 1%, ** significant at 5%, * significant at 10%. Robust standard errors are in parentheses.

Accordingly, the coefficients of interaction term of financial sector development indices and economic globalisation are still statistically significant in Tables 2 and 3, which mean that both institutions and markets should be considered to test the conditional relations among the two variables and their effects on income distribution. Moreover, similar to the empirical findings in Table 1, the macroeconomic and structural variables such as total factor productivity and GDP per capita follow the same statistical pattern in terms of their effects on labor's share. These are also held for

the sub-components of the economic globalisation index, covering the measures of openness. First, although the coefficients of real trade openness are only statistically significant in Table 3, the coefficients of financial openness are significant and negative in each Table. Therefore, it implies that the channel of influences of openness on income distribution is more potent in the presence of implementing a higher degree of openness in the financial account. Finally, the empirical findings provided for the human capital index show that increasing the degree of human capital diminishes the intra-class inequality based on income distribution among workers only in the case of Table 3.

3.2. Empirical Results for System-GMM

The paper also uses the system-GMM estimator to test correlations among the variables towards the dynamic panel data structure. In that sense, it controls the endogeneity of the lagged dependent variable for which case that there might be a potential correlation between control variables and disturbance term. Also, the primary reason to use system-GMM is to solve the omitted variable bias, unobserved panel heterogeneity, and measurement errors. In that sense, the dynamic estimations control the technical rule that the number of instruments is exogenous and less than the number of countries. Finally, the paper also benefits from the system-GMM estimator to get rid of the following issues which of those may emerge in the fixed-effects estimations: (i) not holding of strict exogeneity among regressors, (ii) arbitrarily distributed fixed-effects, (iii) heterogeneity, and (iv) serial correlation within panels.

In consideration of these problems, the dataset of study is designed for many panels and not for a very long-run period where the idiosyncratic errors have no autocorrelation. Therefore, it is assumed that the system-GMM estimator is robust to the selected panels. Moreover, Arellano&Bond (1991) imply that the use of both AR(2) test is needed to control the second-order serial correlation of disturbance term and the Hansen (1982) *J*-test to analyse the orthogonality conditions. Depending on the empirical results obtained in Table 4, they show that there is no further serial correlation, and the over-identifying restrictions are not rejected in terms of Hansen *J*-test.

Table 4. System-GMM Estimation Results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
L.Labsh	0.182***	0.460***	0.144***	0.044	0.072**	0.047*	0.338***	0.429***	0.303***
	(0.014)	(0.021)	(0.021)	(0.036)	(0.034)	(0.028)	(0.022)	(0.033)	(0.021)
Fin_Dev	-0.564***			-0.391***					
	(0.040)			(0.051)					
Fin_Dev^2	0.447***			0.368***					
	(0.035)			(0.049)					
Fin_Inst		0.036			-0.131***				
		(0.046)			(0.024)				
Fin_Inst^2		-0.049			-0.028				
		(0.039)			(0.019)				
Fin_Mar			-0.304***			-0.375***			
			(0.020)			(0.073)			
Fin_Mar^2			0.292***			0.276***			
			(0.020)			(0.051)			
Econ_Glob				1.005	1.354**	1.253*			
				(0.619)	(0.554)	(0.677)			
Econ_Glob				-0.967**	-1.069***	-0.910*			
				(0.482)	(0.414)	(0.478)			
Fin_Dev*Econ_Glob							-0.505***		
							(0.052)		
(Fin_Dev*Econ_Glob)^2							0.560***		
							(0.056)		
Fin_Inst*Econ_Glob								-0.605***	
								(0.109)	
(Fin_Inst*Econ_Glob)^2								0.646***	
								(0.114)	
Fin_Mar*Econ_Glob									-0.201***
									(0.029)
(Fin_Mar*Econ_Glob)^2									0.197***
									(0.039)
Constant	0.645***	0.316***	0.566***	0.430**	0.247	0.259	0.490***	0.460***	0.450***
	(0.018)	(0.022)	(0.018)	(0.197)	(0.162)	(0.229)	(0.023)	(0.040)	(0.015)
Hansen J-test	0.26	0.17	0.23	0.23	0.13	0.51	0.19	0.21	0.172
AR(2) test	0.09	0.06	0.09	0.12	0.07	0.13	0.05	0.05	0.09
Wald $\chi 2$ (prob.)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
No. of inst.	16	16	16	16	16	16	16	16	16
No. of obs.	666	666	666	666	666	666	666	666	666
No. of countries	18	18	18	18	18	18	18	18	18

Notes: ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. All models use the two-step GMM technique produced by Arellano&Bover (1995) and of Blundell&Bond (1998) and extended by Roodman (2006), with robust standard errors (Windmeijer, 2005). Hansen *J*-test statistics are provided to specify whether the overidentifying restrictions are valid or not. The collapsing method is used in all GMM models to get rid of from too-many-instruments problem and to provide the orthogonality conditions. The joint null hypothesis implies that the instruments are valid instruments, which means that they are uncorrelated with the error term and that the excluded instruments are correctly excluded from the estimated equation. The results of AR(2) are also provided to check for autocorrelation in case of proper maximum lag distance.

The empirical findings suggest that measures on financial sector development increase the labor share of income in the latter periods of economic development while they decrease in the initial period of financial and economic development. In that sense, this empirical background also substantially holds for both measures of financial sector development, including both sub-components. Therefore, the results still complement the findings supported by Greenwood&Jovanovic (1990), Banerjee&Newman (1993), and Galor&Zeira (1993). In other words, in control of the endogeneity problem estimated by the system-GMM estimator, the estimates are also statistically significant and robust as it is provided in Table 4.

4. CONCLUDING REMARKS

This paper tested the theoretical background of the financial Kuznets hypothesis in terms of the relationship between financial sector development and labor share of income, which infer that a higher level of financial sector development leads to an increase in labor's share accruing in national income. In consideration of social segregation of total national income among different groups, the labor's share decreases in the earlier stages of economic development, but in the latter period, the income divide narrows on behalf of workers. In this sense, the empirical results show that there is a positive and statistically significant correlation between financial sector development and labor share of income, in contrast to the empirical foundations and theoretical implications of the mainstream studies. Also, in contrast to the traditional knowledge for the case that a higher degree of economic globalisation in terms of openness measures covering the financial accounts and trade regime, as suggested by Bumann&Lensink (2016), this study found opposite results: a higher level of economic globalisation widens the income divide at the expense of workers by way of lowering the labor share of income. This empirical finding was also validated with the proxy variables of economic globalisation index, as Haan et al. (2018) posited. Therefore, the empirical results in no small extent attempted to investigate the statistical and theoretical validity of an inverted U-shaped relationship for the financial Kuznets hypothesis in the presence of several indicators to ascertain the contending and complementing points of this study from the other empirical papers.

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APPENDIX

Table A1. Summary of the Data Information

Code	Variable	Source
Labsh	Labor Share of Income (%)	Penn World Tables 9.1
Fin_Dev	Overall Financial Sector Development Index	IMF Data
Fin_Dev^2	Square of Overall Financial Sector Development Index	IMF Data, Author's Calculation
Fın_Inst	Financial Institutions Development Index	IMF Data
Fin_Inst^2	Square of Financial Institutions Development Index	IMF Data, Author's Calculation
Fin_Mar	Financial Markets Development Index	IMF Data
Fin_Mar^2	Square of Financial Markets Development Index	IMF Data, Author's Calculation
Econ_Glob	Economic Globalization Index	KOF Globalization Index
Econ_Glob^2	Square of Economic Globalization Index	KOF Globalization Index, Author's Calculation
TFP	Total Factor Productivity Index	Penn World Tables 9.1
TFP^2	Square of Total Factor Productivity Index	Penn World Tables 9.1, Author's Calculation
Log(GDPperCap)	Logarithm of GDP per Capita (constant 2010 US$)	World Bank World Development Indicators database
Log(GDPperCap)^2	Square of Logarithm of GDP per Capita (constant 2010 US$)	World Bank World Development Indicators database, Author's Calculation
Human_Cap	Human Capital Index	Penn World Tables 9.1
Human_Cap*Labor_Force	Interaction term of Human Capital Index and Labor Force Participation Rate (% of Total Population Ages +15)	Penn World Tables 9.1, World Bank World Development Indicators database, Author's Calculation
Gov_Share	Government Share (%)	Penn World Tables 9.1
Fin_Open	Financial Openness Index	Chinn and Ito (2006)
Real_Trade_Open	Real Trade Openness Index	Penn World Tables 9.1, World Bank World Development Indicators database, Author's Calculation
Fin_Dev*Econ_Glob	Interaction of Overall Financial Sector Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation
(Fin_Dev*Econ_Glob)^2	Square of Interaction Term between Overall Financial Sector Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation
Fin_Inst*Econ_Glob	Interaction of Financial Institutions Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation
(Fin_Inst*Econ_Glob)^2	Square of Interaction Term between Financial Institutions Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation
Fin_Mar*Econ_Glob	Interaction of Financial Markets Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation
(Fin_Mar*Econ_Glob)^2	Square of Interaction Term between Financial Markets Development and Economic Globalization Index	IMF Data, KOF Globalization Index, Author's Calculation

Table A2. Descriptive Statistics

Country	Labsh	Fin_ Dev	Fin_ Inst	Fin_ Mar	Econ_ Glob	Fin_ Open	Real_ Trade_Open	GDPperCap	Labor _Force	Human_Cap	TFP	Gov_ Share
Australia	60,99577	98,83754	83,43519	58,01667	59,65586	1,446047	32,31418	42558,36	63,37362	3,431284	98,83754	14,4002
Belgium	62,95286	48,56495	64,22418	31,86664	83,80029	1,742148	122,6537	37238,19	50,8819	2,909635	95,44568	18,33167
Canada	67,00289	67,67231	80,36964	53,52707	61,64211	2,346708	49,39436	39272,11	66,06468	3,441664	98,61906	16,3938
Chile	46,48369	38,16005	48,83629	26,66735	59,01437	-0,15604	30,00754	9238,316	54,95525	2,767297	104,7992	16,93149
Denmark	63,7482	58,82923	80,77828	35,62147	77,40409	1,7555	89,48237	51349,94	65,46656	3,255317	98,51544	20,42553
Finland	61,27139	49,65768	55,48392	42,76897	72,95026	1,908294	64,57138	37787,1	60,74719	3,105869	89,71071	18,3372
France	63,65719	59,88381	74,95128	43,53507	69,80617	1,501194	45,34274	35749,41	56,03892	2,891299	96,14554	18,7994
Germany	64,41159	67,03104	75,16933	57,45856	71,80533	2,346708	53,30157	36263,57	57,77329	3,504236	90,24727	15,19614
Israel	57,4004	46,2602	58,91151	32,6191	64,10576	0,630344	51,53102	25699,26	58,98539	3,304042	93,20729	27,75826
Italy	54,06197	59,53924	70,36553	47,43905	61,30204	1,43588	36,06286	32694,27	49,06504	2,730789	107,2614	14,52453
Japan	58,16978	69,89634	85,07507	53,22211	49,44461	2,272515	23,63577	39773	61,87411	3,309566	98,72345	15,66512
Korea	54,22498	65,56903	67,64364	62,0915	47,54574	-0,08915	40,82335	14301,8	60,65127	3,102138	81,44234	12,46754
Netherlands	62,84447	66,65779	80,14838	51,74099	83,72486	2,314962	103,9029	42261,01	59,86713	3,114041	95,75895	18,29787
Norway	51,8928	55,10354	52,86188	56,16621	72,5606	1,360701	66,1966	74286,33	70,2207	3,342937	99,94528	14,53787
Spain	62,56593	66,57676	77,89765	53,83139	63,59995	1,394426	36,54559	25687,83	53,03582	2,590705	104,2748	15,22957
Sweden	55,3593	58,95134	63,60501	53,03635	74,67235	1,840845	76,82069	43354,23	69,50883	3,194937	90,56244	20,96911
UK	57,55088	74,12013	86,02984	60,62455	75,81771	2,306239	48,96188	33306,58	61,47157	3,4178	93,69548	17,33017
USA	60,97884	73,00763	74,86708	69,58611	58,79072	2,346708	18,84341	41592,75	65,38161	3,551919	91,59117	10,9675