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## The structure of financial systems and top incomes in advanced economies: A comparative distributional analysis of the financial wage premium

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# LIS

## Working Paper Series

No. 822

### The Structure of Financial Systems and Top Incomes in Advanced Economies: A Comparative Distributional Analysis of the Financial Wage Premium

Anthony Roberts, Roy Kwon

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**The Structure of Financial Systems and Top Incomes in Advanced Economies:**  
*A Comparative Distributional Analysis of the Financial Wage Premium*

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**Abstract**

Prior country case studies show substantial wage premiums in the financial sector contributes to growth of top incomes and wage inequality in a select group of advanced economies. However, while comparative studies show financialization exerts heterogeneous effects on wage inequality across advanced economies, it is unclear whether the magnitude and location of financial wage premium in the distribution of income varies across advanced economies. We address this gap in the empirical literature by examining the financial wage premium across the labor income distributions of 13 advanced economies since the 1980s using harmonized labor force data from multiple waves of the Luxembourg Income Study. Consistent with prior studies, we find the financial wage premium is concentrated at the upper end of the income distribution in most advanced economies, but the magnitude of the premium substantially varies across these economies. We account for this variation by showing the market structure of financial systems exacerbates the financial wage premium at the upper end of the distribution. Overall, this study shows the financial wage premium is an important distributional mechanism for understanding the growth of top incomes and wage inequality in advanced economies and the marketization of financial activity amplifies the wage dynamics of financialization.

**Keywords:** Financialization, Top Incomes, Wage Inequality, Economic Methodology, Comparative Sociology

**Word Count:** 9969 (including footnotes and references)

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## **1. Introduction**

Over the last few decades, the growth of wage inequality in advanced economies has raised concerns about economic stratification in contemporary society (e.g. CBO 2011; Firebaugh 2003; Ravallion 2014; Alderson and Nielsen 2002). The recent growth of wage inequality in advanced economies is a primarily a function of increased earnings among the highest paid labor in these economies (e.g. Autor, Katz, and Kearney 2006; Lemieux 2008; Piketty and Saez 2006; Hacker and Pierson 2010; Atkinson and Piketty 2010). However, despite decades of empirical research, the distributional mechanisms driving the growth of top labor incomes remain somewhat unclear and debated in the extant literature. The present study aims to identify and empirically examine an important mechanism behind contemporary wage inequality and the growth of top incomes in advanced economies.

A recent explanation for growth of top incomes is the financialization of advanced economies expanded wages and salaries of financial labor by diverting economic resources into the financial sector (Davis 2009; Krippner 2011; Roberts and Kwon 2017; Hyde, Vachon, and Wallerstein 2018; Godechot 2012; 2016). Prior country case studies show substantial wage premiums for the highest earners in the financial sectors in the United States, United Kingdom, and France (Tomaskovic-Devey and Lin 2011; Godechot 2012; Lin and Tomaskovic-Devey 2013; Phillippon and Reshef, 2013; Lin 2015; Kaplan and Ruah 2010). However, recent comparative research suggests financialization exerts heterogeneous effects on wage inequality across advanced economies (Flaherty 2015; Kwon and Roberts 2015; Roberts and Kwon 2017; Kwon, Roberts, and Zingales 2017; Kwon 2018; Huber, Petrova, and Stephens 2020). Despite the persistent findings in the country-specific and comparative literature, contemporary research has yet to examine cross-national heterogeneity in the financial wage premium and its contribution to

wage inequality in advanced economies. The present study fills this empirical gap by measuring the magnitude and location of the financial wage premium across the income distributions of advanced economies since the 1980s and the contribution of the premium to top wage inequality.

The heterogeneous effects of financialization on top incomes and wage inequality is a function of recent labor market developments (Kwon and Roberts 2015), the distribution of power resources (Flaherty 2015; Huber et al 2020), the institutional configuration of corporate governance and industrial relations (Roberts and Kwon 2017; Kwon et al. 2017), and financial deregulation (Kwon 2018). However, some argue this heterogeneity is attributable to cross-national differences in the ‘nature’ of financialization (Van de Zwan 2014; Berghoff 2016; Maxfield et al. 2017). We draw on the comparative financial economics literature to understand *structural* differences in financialization according to the degree to which financial activity is organized and coordinated by markets and institutions (e.g. Levine 2002).<sup>1</sup> While prior research shows the structural differences in financial systems is important for explaining cross-national differences in economic growth (Holmstrom and Tirole 1993; Levine 1991; Obstfeld 1994; Boot and Thakor 1997; Allen and Gale 1999), it is unclear how these differences explain cross-national differences in the growth of top incomes and wage inequality in advanced economies. The present study aims to fill this empirical gap by examining whether cross-national differences in the market structure of financial systems explains heterogeneity in the magnitude and location of the financial wage premiums across the upper-end of the income distributions in advanced economies. In doing so, we extend on contemporary theories of financialization and income

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<sup>1</sup> In advanced economies with traditionally market-based financial systems (e.g. United States and United Kingdom), financial activity primarily occurs through arms-length transactions in stock, bond, and derivative markets. In contrast, financial activity in bank-based systems (e.g. Austria and Germany) is primarily organized and coordinated by larger financial institutions and other stakeholders.

inequality by identifying how the structure of financial systems affects the wage dynamics of financialization in advanced economies.

Overall, this study makes two important empirical contributions to the extant literature. First, we advance the methodology in the literature by developing and applying a comparative distributional approach for measuring and explaining cross-national heterogeneity in the financial wage premium. Prior country case studies (e.g. Freeman 2010; Tomaskovic-Devey and Lin 2011; Philippon and Reshef 2013) severely under-estimated the financial wage premium by observing the *conditional average wage differences* between financial and non-financial sectors. Other studies (e.g. Lin 2015; Chi et al. 2011; Roberts *Forthcoming*) have tried to address this issue by utilizing recentered influence function (RIF) regression to measure the financial wage premium across different percentiles of the observed distribution of income. However, RIF regression conflates population-level effects of financial employment with the financial wage premium (Borgen, Haupt, Wiborg 2020). Accordingly, we employ a two-staged approach for observing the financial wage premium based on analyzing and explaining the population- and individual-level effects of financial employment across the upper end of the unconditional distributions of labor income in advanced economies. This comparative distributional approach provides the most generalizable and robust evidence of the financial wage premium and its contribution to wage inequality across advanced economies.

Second, we extend empirical research by utilizing this comparative distributional approach to generate comparable estimates of the financial wage premium across advanced economies. Prior studies have exclusively estimated the premium in the U.S. (Lin 2015), U.K. (Bell and Van Reenen 2013); or France (Godechot 2012) using different data sources which renders these estimates incomparable across countries. Drawing on harmonized labor force data

from multiple waves of the Luxembourg Income Study, we measure the location and magnitude of the financial wage premium in the labor income distributions of 13 advanced countries since the 1980s. Consistent with prior country case studies, we find the financial wage premium is concentrated at the upper end of the income distribution with the largest premiums at the 90<sup>th</sup> and 95<sup>th</sup> percentile of labor income and this wage dynamic increases top wage inequality by about 8 percent. However, we also find the size of the financial wage premium for the highest earners substantially varies across advanced economies and this variation is partially explained by financial marketization where countries with highly developed financial market systems exhibit the largest premiums. Overall, the study shows the financial wage premium is not ubiquitous across advanced economies and the premium is an important mechanism linking financialization to top income growth and wage inequality in advanced economies.

## **2. Financialization, Top Incomes, & Wage Inequality in Advanced Economies**

**[Figure 1 Here]**

The growth of wage inequality in advanced economies is attributed to wage growth at the top end of the labor income distribution (e.g. Autor, et al. 2006; Lemieux 2008; Piketty and Saez 2006; Hacker and Pierson 2010; Atkinson and Piketty 2010). Figure 1 shows this asymmetrical growth using the ratio of the 90<sup>th</sup> percentile to the 50<sup>th</sup> percentile of labor income before (2000-2006) and after the Great Recession (2010-2016) in 13 advanced economies. During the pre-recession period, the labor income at the 90<sup>th</sup> percentile was about 2.09 times greater than median. In the post-recession period, labor income at the 90<sup>th</sup> percentile increased to about 2.6 times more than median labor income. This change in the 90<sup>th</sup>-50<sup>th</sup> labor income ratio is primarily due to differences in the growth of labor incomes at the top and median of the

distribution. Income at the 90<sup>th</sup> percentile grew by an average of 35.4 percent while income at the 50<sup>th</sup> percentile grew by an average of 21.5 percent during this period.

Despite the general growth of upper-end wage inequality, we find notable cross-national differences in the 90<sup>th</sup>-50<sup>th</sup> labor income ratio across advanced economies. For example, this wage ratio increased by over 33 percent in Switzerland, 30 percent in Australia, 31 percent in the Netherlands, and 23 percent in the United States. However, while the 90<sup>th</sup>-50<sup>th</sup> wage ratio increased by average of 26 percent in most countries, the wage ratio *declined* by 13 percent in Belgium and 3 percent in Luxembourg.

The growth of income inequality in advanced countries has been extensively studied over the last few decades (e.g. Alderson and Nielsen 2002; Wallerstein 1999; Rueda and Pontusson, 2000; Mahler, 2004; Bradley *et al.*, 2003; Mahutga, Roberts, and Kwon 2017). While income inequality initially declined during the 1950s and 60s, this trend reversed in the 1980s in most advanced economies (Alderson and Nielsen 2002). The ‘Great U-Turn’ of income inequality was explained by the growth of international competition in manufacturing and skill-biased technological change which increased the demand for skilled labor while reducing the demand for unskilled labor (Bluestone and Harrison, 1982; Alderson and Nielsen, 2002; Acemoglu 2002; 2003; Autor, et al. 2006). As a result, a *skill wage premium* emerged in the labor markets of advanced economies with deindustrialization and the outsourcing low-skilled manufacturing production (Wood, 1994; Alderson, 1999; Alderson and Nielsen, 2002; Mahutga, Roberts, and Kwon 2017) as well as the automation of routinized occupations (Autor et al 2006). However, studies show the skill wage premium is an insufficient for explaining the growth of top incomes in advanced economies (e.g. Lin 2015; Bell and Van Reenen 2013; Godechot 2012)



Recent studies have turned toward financialization to explain the growth of income inequality and top incomes in advanced economies (e.g. Lin and Tomaskovic-Devey 2013; Flaherty 2015; Godechot 2016; Kwon and Roberts 2015; Roberts and Kwon 2017). Over the last few decades, financialization fundamentally transformed advanced economies by shifting profit-making from trade and commodity production to increasingly financial investment (Arrighi, 1994; Krippner, 2005; 2011). This transformation restructured these economies by increasing the influence of financial markets, financial institutions, and financial elites over economic policy and economic outcomes (Palley, 2007: 2). As a result, economic profits were increasingly diverted into the financial sector which enriched investors, executives, managers, and workers in this sector (Tomaskovic-Devey and Lin 2011; Freeman 2010). This dynamic empowered financial actors with greater bargaining and claim-making power over the distribution of national income and wealth (Lin and Tomaskovic-Devey, 2013; Godechot 2016).

The excessive compensation among elite workers, managers, and executives in the financial sector is well documented. For example, Tomaskovic-Devey and Lin (2011) show U.S. workers in the finance, insurance, and real estate (FIRE) sectors earn 2 to 4 times above the average national per capita income. And 70 percent of the total growth in earnings at the 95th percentile can be attributed the rise of the financial wage premium (Lin 2015). Bell and Van Reenen (2013) find wages at the top incomes in the U.K. increased over the last 10 years and 75 percent of the income share of the top 1 percent went to earners in the financial sector. Similarly, Godechot (2012) finds one quarter of the top 0.1 percent earners in France are employed in finance and these workers account for about half of the rise in the income share of this group between 1996-2007. And these findings are consistent with studies showing a rapid growth in the labor incomes of financial executives (Freeman 2010; Philippon and Reshef 2013), managers

(Goldstein 2012); and other employees (Lin and Tomaskovic-Devey 2013). Accordingly, we expect:

**H1:** Labor income in the financial sector is greater than labor income in non-financial sectors at the upper percentiles of the income distribution.

**[Insert Figure 2]**

Figure 2 shows this financial wage premium at the 50<sup>th</sup> and 90<sup>th</sup> percentiles of labor income in 13 advanced economies. The figure shows a high degree of cross-national heterogeneity in the size of the financial wage premium. For example, labor income at the 90<sup>th</sup> percentile in the British financial sector is over 50 percent higher than labor income in non-financial sectors while labor income at the 90<sup>th</sup> percentile in the Luxembourg's financial sector is about 22 percent higher than non-financial sectors. In contrast, labor income at the 50<sup>th</sup> percentile in Luxembourg's financial sector was about 47 percent higher than labor income in other sectors while median labor income in the Australia financial sector was only about 18 percent higher than labor income in other sectors.

In most countries, the financial wage premium at the 90<sup>th</sup> percentile is greater than the premium at the 50<sup>th</sup> percentile. However, the magnitude of this difference substantially varies across advanced economies. For example, in Germany, France, and Luxembourg, we find the premium is larger at the 50<sup>th</sup> percentile compared to the 90<sup>th</sup> percentile. In the United Kingdom, United States, Finland, Denmark, Switzerland, and Australia, we find the opposite with the premium at the 90<sup>th</sup> percentile being an average of 62 percent greater than the premium at the 50<sup>th</sup> percentile.

### **3. Financial Market Structure and Wage Premiums in Advanced Economies**

Prior comparative studies consistently show a positive association between financialization and wage inequality in advanced economies (e.g. Godechot 2016; Kwon et al. 2017; Flaherty 2015; Kwon and Robert 2015; Kwon 2018; Huber et al. 2020). More importantly, these studies show a high degree of heterogeneity in this association based on cross-national differences in corporate governance and industrial relations (Roberts and Kwon 2017; Kwon et al. 2017), labor market developments (Kwon and Roberts 2015), financial deregulation (Kwon 2018), and power resources (Flaherty 2015; Huber et al 2020). However, despite these empirical observations, comparative research on advanced economies has largely ignored how the market structure of financial systems contributes to the growth of top incomes which is surprising because financialization is inherently a market a process defined by an “increase in social activity devoted to trade in securities on financial markets” (Godechot 2016: 496).

The structure of financial systems is driven by the development of financial institutions (e.g. banks and insurance companies) and markets (e.g. stocks, bonds, and derivative markets) (Levine 2002; 2005; Carlin and Mayer 2003; Cihak et al 2013). Over the last three decades, the financial systems of advanced economies have evolved into a complex constellation of diverse institutions and markets which has increased access to financial resources and the efficient allocation these resources to firms and households (Chiak et al. 2013; Svirydzenka 216). Accordingly, financial market development is understood as a multidimensional process consisting of the growth of financial market depth, access, and efficiency. Here, financial market depth refers to the relative size of financial markets for stocks, bonds, and derivatives. Financial market access refers to the extent to which a wide range of firms and households can participate in financial markets. And financial market efficiency refers to the transactional costs associated with participating in financial markets.

More generally, financial market development indicates a structural change in financial systems where financial activity is increasing organized, coordinated, and governed by arms-length transactions between actors in stock, bond, and derivative markets. This type of financial system fosters a greater of knowledge of finance since it is easier to profit from this information by trading in more liquid markets (Holmstrom and Tirole, 1993); increases shareholder governance and tying managerial compensation to firm performance (Jensen and Murphy, 1990); and increases risk and volatility in investment (Levine, 1991; Obstfeld, 1994). At the same time, it also induces myopic investment climates where investors can inexpensively sell shares that results in limited corporate control (Allen and Gale, 1999; Bencivenga and Smith, 1991; Diamond, 1984; Ramakrishnan and Thakor, 1984). Overall, the development of financial markets may produce substantial differences in the structure of financial systems.

**[Figure 3 Here]**

Figure 3 shows cross-national differences in the market structure of financial systems in advanced economies based on the average level of financial market development in 13 OECD countries between 2000 and 2016. Generally, we find substantial cross-national difference in the level of financial market development. Countries traditionally defined as market-based financial systems (United States, United Kingdom, Switzerland, and Australia) exhibit the high levels of market development while countries traditionally defined as bank-based financial systems (France, Finland, Belgium, and Denmark) exhibit the low to moderate levels. This suggests the structure of financial systems and nature of financialization may substantially vary across advanced economies. Accordingly, cross-national differences in financial market development may account for observed differences in the financial wage premium.

We contend financial market development increases the size of the financial wage premium among top earners. Generally, the marketization of financial activity reduces the ability of stakeholders to influence corporate borrowing and investment by creating markets for trading securities and increasing the volume of tradable assets. As a result, corporations increasingly shift toward financial investments which rewards workers, managers, and executives in the financial sector with larger wages, salaries, and bonuses (Goldstein, 2012; Shin, 2012). More importantly, financial labor can utilize a ‘hold-up mechanism’ when negotiating for higher remuneration with financial firms (Godechot 2012; 2016; 2020). Marketized finance emphasizes the standardization and liquidity of financial activity which allows financial labor to appropriate human (knowledge, know-how, etc.) and social capital (clients, staff) for financial investment (Godechot 2016: 498). Since financial firms are unable to institutionalize this capital through patents and non-compete clauses, financial labor gains significant leverage when negotiating over wages and salaries by threatening to relocate to another financial firm.

Additionally, the expansion of financial market intermediation induces a shift in corporate investment among non-financial firms from long-term investment in production and labor to short-term investment in financial speculation. For example, Tori and Onaran (2020) show a growth in financial income and payments among non-financial firms is associated with a decline in investment in fixed assets and this association is amplified in countries with high financial market development. The marketization of financial activity induces firms to become less attuned to the interests of labor and more attuned to the interests of shareholders (Lin and Tomaskovic-Devey, 2013). Greater concern with the interests of shareholders pressures firms into seeking short-term profitability and causes non-financial firms to divest from labor while simultaneously promoting labor market flexibility through anti-union activities and investment in

labor-saving technologies (Fligstein and Shin, 2007; Shin, 2017; Kollmeyer and Peters, 2019).

As a result, wages and salaries in non-financial sector decline. Accordingly, we expect:

**H2:** Financial market development is positively associated with a financial wage premium at the upper end of the labor income distribution.

#### **4. Sample & Measurement**

This study utilizes data from harmonized national labor force surveys in 13 advanced economies across all available waves (1984-2016) of the Luxembourg Income Study (LIS) micro dataset.<sup>2</sup>

National surveys were selected from the LIS dataset based on the availability of respondent-level data on labor income and covariates. The overall sample was restricted to adult respondents between the ages of 18 and 64 who reported full-time employment. The total sample is composed of 1.66 million full-time workers nested in 85 country-years.<sup>3</sup>

##### *4.1 Personal Labor Income*

The main outcome of the study is the annual labor income of respondents. Annual labor income is measured as monetary payments and the value of nonmonetary goods and services received from dependent employment. This measure is preferred over wages because it includes bonuses which have significantly increased in the financial sector (Goldstein 2012; Freeman 2010). Following LIS recommendations, we trimmed labor income by deleting all zero and negative values.<sup>4</sup> We converted labor income from national currency to constant 2010 U.S. dollars and transformed the variable using the natural log to improve comparability, normality, and the interpretability of marginal effects.

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<sup>2</sup> Countries in the sample include Australia, Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg, The Netherlands, Switzerland, United Kingdom, and United States.

<sup>3</sup> See Appendix 1 for full sample information. The sample is reduced to 67 country-years in the cross-national models because full information on country covariates is only available from 1995 to 2016.

<sup>4</sup> The LIS does not directly top-code income in their data. However, country-specific income data (e.g. the Current Population Survey in the United States) is top-coded. However, a recent study shows top income data in the LIS microdata is comparable to tax data up to the 99<sup>th</sup> percentile of income (Yozan et al. 2021).

#### *4.2 Employment in the Financial Sector*

The focal respondent-level variable is an indicator for employment in the financial sector. The LIS harmonizes national industry classifications using a 9-category scheme: agriculture, forestry and fishing; mining and quarrying; manufacturing; utilities; construction; wholesale and retail trade, repair; hotels and restaurants; transport, storage and communications; financial intermediation; real estate, renting and business activities; public administration; education; health and social work; and other community, social/personal services; activities of households; extra-territorial. Employment in the financial sector is measured by whether the respondent reported an occupation in the financial intermediation industry. All other industries define non-financial sectors. In the total sample, an average of 4.1 percent of respondents reported employment in the financial sector.

#### *4.3 Labor Income Controls*

We adjust for skill, occupation, and socio-demographic characteristics for valid measurement of above-market earnings in the financial sector (Mincer 1974). Specifically, we adjust for respondent education, age, occupation, marital status, and sex when estimating wage premiums. Variation in skill and human capital is indirectly measured using indicators of low (reference), medium, and high educational attainment based on the harmonization of country-specific measures of education from the LIS. Additionally, we included a linear and squared term of age to indirectly account for work experience and skill acquisition over a career. We also adjust for occupational differences by controlling for whether respondents were employed in a managerial, skilled, and unskilled (reference) occupation based on the LIS harmonization of country-specific occupational categories. Finally, we control for demographic characteristics using indicators for whether the respondent was male and married.

#### *4.4 Financial Market & Institution Development*

The focal country-level variable is the degree of financial market development. This is measured using a multidimensional index based on three sub-indices for financial market depth, access, and efficiency.<sup>5</sup> The financial market depth sub-index is measured using stock market capitalization, valuation of stocks traded, international debt securities to government, and total debt securities of financial and non-financial corporations. The financial market access sub-index is measured by the percent of market capitalization outside of the top 10 largest companies and the total number of issuers of debt per 100,000 adults. The financial market efficiency sub-index is measured by the stock market turnover ratio. A multidimensional measure is important for operationalizing financial market development because the size, access to, and transaction costs of financial markets are important for determining the extent to which financial systems are organized, coordinated, and governed by markets (Chiak et al. 2013; Svirydzenka 2016).

We also control for financial institution development because the depth, access, and efficiency of financial institutions play a pivotal role in the structure of financial systems. This is measured using a multidimensional index composed of three subindices for financial institution depth, access, and efficiency. Financial institution depth is measured by bank credit to the private sector, pension fund assets, mutual fund assets, and insurance premiums. Financial institution access is measured by bank branches and ATMs per 100,000 adults. And financial institution efficiency is measured by the banking sector net interest margin, lending-to-deposit spread, and non-interest income to total income. Data on both multidimensional indices are drawn from the *Financial Development Index* database (IMF 2019).

#### *4.5 Financial Deregulation*

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<sup>5</sup> The composite index is based on the weighted sub-indices. Weights were derived from the factor loadings of a principal component analysis.



The deregulation of financial industries is an important factor explaining financialization in advanced economies (Krippner 2011; Davis 2009; Tomaskovic-Devey and Lin 2011; Kwon 2018). Accordingly, we control for financial deregulation using the *Heritage Foundation's Financial Freedom Index* when examining the effect of financial market development on wage premiums (Heritage 2019). The Financial Freedom Index measures the extent to which financial services are regulated by the government; the degree of state intervention in banks and other financial firms through direct or indirect ownership; government influence on the allocation of credit; and the openness of foreign competition. Each of these indicators are drawn from multiple data sources and aggregated into a normalized index. The index is designed for measuring the degree of *deregulation* where higher scores indicate less restriction. This index is preferred over other indices because of its greater temporal and cross-national coverage. For example, the commonly used *Financial Reform Index* only contains data before 2006 (Abiad et al. 2008).

#### *4.6 Wage-Setting Institutions*

Prior studies show financial market development is partially determined by the degree of nonmarket cooperation between economic and political stakeholders in advanced economies (Grittersova 2014a; 2014b). Therefore, we control for union density and wage coordination when measuring the effect of financial market development on wage premiums. Union density is measured as the proportion of waged and salary earners that are active members in a union. Wage coordination is measured with a 5-point ordinal scale of the wage-setting systems with the first category indicating a highly decentralized and employee-employer wage-setting while the highest category indicating a high centralized system where wages are negotiated between union and business confederations. Both measures of wage-setting are drawn from the *Institutional*

*Characteristics of Trade Unions, Wage Setting, State Intervention, and Social Pacts* database (Visser 2019).

**[Table 1 Here]**

Table 1 reports summary statistics of the respondent- and country-level variables for the full sample of respondents and country-years.

## **5. Analytical Strategy**

The analysis is organized into three interrelated parts. First, we estimate the population-level effect of financial employment on the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of labor income in each country-year sample using recentered-influence function (RIF) regression. We then decompose these estimates using Kitagawa-Blinder-Oaxaca (KBO) decomposition to measure the contribution of the financial wage premium to the population-level effect.<sup>6</sup> Second, we directly measure the financial wage premium using adjusted labor income differences between respondents in financial and non-financial sectors using unconditional quantile treatment effects. We estimate the premium in each country-year sample to examine cross-national and longitudinal variation in the size of the premium at the upper end of labor income distributions. Third, we utilize these estimates to measure the effect of financial market development on the size of each financial wage premium at the upper end of the distribution using panel models.

### *5.1 The Population-Level Effect of Financial Employment on Top Labor Incomes*

We utilize RIF regression to estimate the population-level effect of financial employment on the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of the observed labor income in 13 advanced economies. RIF regression measures the marginal effect of covariates on the *unconditional* quantile of the outcome's distribution by using an influence function to transform the outcome

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<sup>6</sup> Country-year RIF and OB estimates were averaged within each country for cross-national comparison.

variable (Firpo et al. 2009; Fortin et al. 2011). As in robust statistics, an influence function is the relation between a single data point and the statistic of interest (Lin 2015). RIF regression re-centers the outcome variable using the following transformation:

$$(A) RIF(y_i; q_\tau) = \tau - \mathbf{1}(y \leq q_\tau) f_\gamma(q_\tau) + q_\tau$$

Equation A shows the re-centered influence function where  $y$  denotes the observed log annual labor income;  $\mathbf{1}(y \leq q_\tau)$  is an indicator of whether the observed log income exceed the quantile ( $q_\tau$ ); and  $f_\gamma(q_\tau)$  and is influence function of  $y$  which operates as the probability density of  $y$  at a given quantile. Given to the utility of unconditional quantile regression, estimates of the population-level effect of financial employment is measured with the following multivariate model:

$$(B) RIF(y_i; q_\tau) = \alpha_\tau + \beta_{1,\tau} F_i + \sum \beta_{k,\tau,i} X_{k,i} + \varepsilon_{t,i}$$

The left-hand side of Equation B is the transformation of log annual labor income for quantile  $q$ . The right-hand side of Equation B is composed of the additive effects of the covariates.  $F$  is an indicator for employment in the financial sectors.  $\beta_1$  measures the effect of financial employment on the labor income at a given a quantile of the observed labor income distribution ( $\tau$ ).  $X_k$  is a vector of labor income controls as described above.  $\beta_k$  is a vector of coefficient measuring the marginal effects of these covariates.  $\beta_1 > 0$  suggests financial employment increases labor income at the observed quantile.

This population effect is based on the employment composition of the financial sector, the observed distribution of labor income, and the unconditional quantile treatment effect of financial employment (Borgen et al. 2020). While prior studies have utilized RIF regression to measure the financial wage premium (e.g. Lin 2015; Chen et al. 2011; Roberts 2021), these estimates conflate the premium with the other components. Therefore, we utilize KOB

decomposition to measure the contribution of the financial wage premium to the population-level effect of financial employment on labor income (Firpo et al. 2018). We expect the financial wage premium to explain most of the population-level effect since average employment in the financial sector only accounts for about 4.1 percent of the total sample.

### *5.2 Estimating the Financial Wage Premium*

We directly measure the financial wage premium using unconditional quantile treatment effect (UQTE) of financial employment on the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of labor income. Estimates of the UQTE are based on a framework developed by Firpo (2007) which utilizes propensity score matching to construct equivalent treatment (employed in the financial sector) and control (employed in non-financial sectors) groups in the analysis. In this analysis, we construct equivalent groups based on matching workers with the following variables: year of survey, age, gender, occupation, and marital status. This ensure the only difference between these groups is their industry of employment (financial or non-financial). Based on these groups, we observe labor income differences across the upper end of the distribution in each country-year sample based on the following equation:

$$(C) \text{ UQTE}^\tau = Q_F^\tau - Q_{NF}^\tau$$

Equation C shows the labor income difference (UQTE) at the observed quantile ( $\tau$ ) for matched groups of workers in the financial sector (F) and non-financial sectors (NF). In the first stage of this analysis, respondents in the financial sector are matched with respondents in non-financial sectors based on similarities in age, occupation, education, gender, marital status, year to create equivalent groups of workers that only different in their sectoral employment. In the second stage of this analysis, differences in the observed labor income quantiles are measured between the two groups. A  $\text{UQTE} > 0$  provides evidence of a financial wage premium in the unconditional distribution of labor income.

### 5.3 Estimating the Effect of Financial Market Development on the Financial Wage Premium

We compile 268 estimates of the UQTE at 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentile of labor income in 67 country-years to examine the cross-national and longitudinal heterogeneity in the financial wage premium.<sup>7</sup> Specifically, we utilize random-effect and fixed-effect models to measure the association between financial market development and the estimates of the financial wage premium at each percentile in a pooled sample of country-years based on the following equation:

$$(D) UQTE_{it}^{\tau} = \alpha_{it} + \beta_1 FM_{it} + \sum \beta_k X_{it} + \gamma_i + \sigma_{it} + \epsilon_{it}$$

Equation D shows the UQTE of financial employment at a given quantile ( $\tau$ ) as a linear function of country-level covariates. FM indicates the degree of financial market development in country  $i$  and year  $t$  in the sample.  $\beta_1$  measures the average effect of financial market development on the size of the financial wage premium while controlling for a vector of covariates ( $X_{it}$ ) including a linear term for year.<sup>8</sup> We account for unobserved time invariant heterogeneity ( $\gamma_i$ ) with a random country-level intercept or a vector of fixed country intercepts. Additionally, we follow the recommendation of Lewis and Linzer (2005) for estimated dependent variable models by including a parameter ( $\sigma_{it}$ ) to measure variability in the sample estimate of the UQTE. Based on Equation D,  $\beta_1 > 0$  indicates the size of the financial premium at a given quantile increases with financial market development.

## 6. Results

### 6.1 The Population-Level Effect of Financial Employment on Top Labor Incomes & Wage

#### *Inequality*

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<sup>7</sup> The models are restricted to a sample of 67 country-years because of the availability of the financial deregulation variable (1995-2016).

<sup>8</sup> Appendix 2 shows the cross-national correlations and variance inflation factors of the covariates.

**[Figure 4 Here]**

Figure 4 shows the marginal effect of financial employment on the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of labor income in 13 advanced countries. The first panel shows this population-level effect in countries with traditionally market-based financial systems. The second panel shows this effect in countries with traditionally bank-based financial systems. According to Figure 4, the effect of financial employment on 90<sup>th</sup> and 95<sup>th</sup> percentile of labor income is greater in countries with a high degree of financial market development compared to countries with a moderate to low financial market development.

On average, financial employment is associated with a 21 percent increase in labor income at the 90<sup>th</sup> percentile and a 31 percent increase in labor income at the 95<sup>th</sup> percentile in countries with highly developed financial markets. In countries with moderate to low financial market development, financial employment is associated with an 18 percent increase in labor income at the 90<sup>th</sup> percentile and a 21 percent increase in labor income at 95<sup>th</sup> percentile. The associations between financial employment and the median and 75<sup>th</sup> percentile of labor income were similar across the countries. Financial employment is associated with an 11 percent increase the median of labor income and a 14 percent increase in labor income at the 75<sup>th</sup> percentile. This provides initial support for the assertions that financial employment is positively associated with higher labor income at the upper end of the distribution and this distributional dynamic is stronger in countries with highly developed financial markets. However, it is unclear whether this dynamic is attributable to the financial wage premium.

**[Figure 5 Here]**

Figure 5 shows the contribution of financial wage premium to the population-level effects of financial employment on labor income. In countries with highly developed financial markets,

the financial wage premium accounts for 80 percent of the observed effect at the upper end of the labor income distribution. The financial wage premium accounts for 78 percent of the effect of financial employment on median labor income in countries with highly developed financial markets while the premium accounts for 76 percent of the effect in countries with moderate to low financial market development. At the 75<sup>th</sup> percentile of labor income, the premium accounts for 82 percent of the effect in countries with highly developed financial markets while the premium accounts for 71 percent of the effect in countries with low to moderate development. At the 90<sup>th</sup> percentile, the premium accounts for 86 percent of the effect in countries with highly developed financial markets while accounting for 70 percent of the effect in countries with moderate to low development. And, at the 95<sup>th</sup> percentile, the premium accounts for 88 percent to the effect in countries with high development and 72 percent in countries with moderate to low development. These findings are consistent with prior case studies showing the contribution of the premium to population-level effect of financial employment on labor income (e.g. Lin 2015). More importantly, this shows how the financial wage premium is expanding top labor incomes in advanced countries and this distributional effect is greater in countries with highly developed financial markets.

**[Figure 6 Here]**

Figure 6 shows the contribution of this population-level effect of financial employment on the 90<sup>th</sup> to 50<sup>th</sup> wage ratio before and after the Great Recession. In most countries, this effect increased the wage ratio by less than 1 percent (Belgium) to over 14 percent (Switzerland) before the Great Recession and by 4 percent (France) to over 16 percent (United Kingdom) after the Great Recession. Interestingly, this effect *reduced* the wage ratio in Luxembourg by increasing median incomes at a higher rate than at the 90<sup>th</sup> percentile. On average, this effect increased the

90<sup>th</sup>-50<sup>th</sup> wage ratio in countries with highly developed financial markets by 10.5 percent before the Great Recession and 12 percent after the Great Recession. In contrast, this increased only increased the wage ratio by 4.3 percent before and 5.8 percent after the Great Recession in countries with low to moderate financial development. Overall, Figure 6 shows the population-level effect of financial employment directly contributed to the growth of top wage inequality in most advanced economies.

### *6.2 Cross-National & Longitudinal Heterogeneity in the Financial Wage Premium*

#### **[Figure 6 Here]**

We directly measure the financial wage premium across the upper end of the income distribution using unconditional quantile treatment effects based on matching respondents according to wage and sociodemographic covariates. Figure 6 shows these estimates of the financial wage premium at the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of the labor income in 13 advanced countries. Figure 6 is organized into two panels to show the financial wage premium in countries with highly developed financial markets and the premium in countries with low to moderate financial market development. According to Figure 6, median earning workers in the financial sector received about 24 percent more than workers in non-financial sector in countries with highly developed financial markets. In countries with low to moderately developed financial markets, this premium was about 32 percent above earnings in non-financial sectors. At the 75<sup>th</sup> percentile, workers in the financial sector earned about 30 percent more than workers in non-financial sectors in countries with highly developed financial markets. In countries with low to moderately developed markets, this premium was 32 percent above earnings in non-financial sectors. At the 90<sup>th</sup> percentile, workers in the financial sector earned about 41 percent more than workers in non-financial sectors in countries with highly developed financial markets. This



premium was only about 33 percent above earnings in non-financial sectors in countries with low to moderate financial market development. At the 95<sup>th</sup> percentile of labor income, workers in the financial sector earned about 49 percent more than workers in non-financial sectors in countries with highly developed financial markets. This premium was 34 percent above earnings in non-financial sectors in countries with low to moderately developed financial markets.

Overall, Figure 6 supports the first hypothesis. Labor income is higher in the financial sector compared to non-financial sectors at the upper end of the distribution even when adjusting for similarities in age, occupation, education, gender, marital status, and period. More importantly, we find the premium is largest for the highest paid labor in the financial sector and larger in countries with highly developed financial markets.

**[Figure 7 Here]**

In addition to notable cross-national heterogeneity, we also find evidence of longitudinal heterogeneity in the financial wage premium. Figure 7 shows the locally weighted time trends of financial market development, the median financial wage premium, and the premium at the 95<sup>th</sup> percentile in 13 advanced countries between 1995 and 2016. Notably, the locally weighted average of financial market development steadily increased from 1995 until the Great Recession in 2007. After the Great Recession, we find financial market development started to increase again.

During this same period, the median financial wage premium increased from about 27 percent labor income in non-financial sectors in 1995 to about 31 percent above labor income in non-financial sectors in 2016. The financial wage premium at the 95<sup>th</sup> percentile of labor income closely tracked the trend in financial market development. In 1995, workers at the 95<sup>th</sup> percentile of labor income in the financial sector earned about 26 percent more than workers in non-

financial sector. By 2016, this premium increased where workers in the financial sector earned about 38 percent more than workers in the non-financial sector.

Overall, Figure 7 shows the financial wage premium at the median and 95<sup>th</sup> percentile of labor income has grown over the last two decades with the expansion of financial markets. In fact, the trend in financial market development was strongly associated with the trend in the financial wage premium at the 95<sup>th</sup> percentile ( $r = .87$ ;  $p < .001$ ). This provides support for the second hypothesis.

### *6.3 Explaining Cross-National & Longitudinal Heterogeneity in the Financial Wage Premium*

#### **[Figure 8 Here]**

Figure 8 further examines the association between the financial wage premium and financial market development by showing the linear association between financial wage premiums and financial market development in a sample of 13 advanced countries. The first panel shows the linear association between the financial wage premium at the median of labor income and financial market development. Surprisingly, we find the median premium and financial market development are negatively correlated and not statistically related ( $p > .05$ ). The second panel shows the linear association between the financial wage premium at the 75<sup>th</sup> percentile of labor income and financial market development. We find a very weak and positive association between this premium and financial market development ( $p > .05$ ). The third panel shows the linear association between the financial wage premium at the 90<sup>th</sup> percentile and financial market development. We find this premium and market development show a moderate and positive association ( $p < .05$ ). Finally, the fourth panel shows the linear association between the financial wage premium at the 95<sup>th</sup> percentile and financial market development. We find this premium and market development show a strong and positive association ( $p < .01$ ).

Overall, Figure 8 provides additional support for the second hypothesis. As illustrated in Figure 8, financial market development becomes strongly correlated with the financial wage premium at the top end of the labor income distribution which suggests that the premium for the highest earners in the financial sector is greater in countries with highly developed financial markets. However, it is unclear whether the cross-national and longitudinal associations between the financial wage premium and financial market development is confounded by regulatory and wage-setting differences across countries and time.

**[Table 2 Here]**

Table 2 presents random-effect models of the financial wage premiums at the 50<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentiles of labor income in 13 advanced countries from 1995 to 2016. The multivariate models are specified to estimate the partial association between financial market development and the financial wage premiums when controlling for potential confounders. We find these models account for significant cross-national and longitudinal variation in the financial wage premium ( $p < .01$ ). Model 1 explains 12 percent of cross-national variation and 32 percent of longitudinal variation in the median financial wage premium. Model 2 explains 39 percent of cross-national variation and 17 percent of longitudinal variation in the financial wage premium at the 75<sup>th</sup> percentile. Model 3 explains 25 percent of cross-national variation and 14 percent of longitudinal variation in the financial wage premium at the 90<sup>th</sup> percentile. And Model 4 explains 49 percent of cross-national variation and 12 percent of longitudinal variation of the financial wage premium at the 95<sup>th</sup> percentile.

Most importantly, the models show financial market development is significantly associated with the magnitude of the financial wage premium at the 75<sup>th</sup>, 90<sup>th</sup>, and 95<sup>th</sup> percentile of labor income net of financial institution development, financial deregulation, wage

coordination, and unionization. Additionally, we find financial deregulation and wage coordination significantly reduced the size of the median financial wage premium.

According to Model 2, a unit increase in the financial market development index is associated with a .2 increase in the size of the financial wage premium at the 75<sup>th</sup> percentile of labor income. Moreover, we find a unit increase in financial deregulation is associated with a .21 decrease in the size of the premium. According to Models 3 and 4, the financial wage premium at the 90<sup>th</sup> and 95<sup>th</sup> percentiles increase with the development of financial markets. A unit increase in the financial market development index is associated with a .24 increase in the size of the financial wage premium at the 90<sup>th</sup> percentile and .39 increase in the size of the financial wage premium at the 95<sup>th</sup> percentile. Models 5-8 includes a vector of country intercepts to directly account for time-invariant unobserved heterogeneity. Estimates from these models confirm the main results.

## **7. Discussion & Conclusion**

The growth of wage inequality in advance economies remains one of the most important social problems in contemporary society. Prior studies show the growth of wage inequality in advanced economies is primarily explained by rising wages and salaries among the highest earners (Autor, et al. 2006; Lemieux 2008; Piketty and Saez 2006; Hacker and Pierson 2010; Atkinson and Piketty 2010). Increasingly, this growth of top incomes is explained by financialization where the growth and prominence of financial activity in advanced economies contributes rising incomes of top earners in the financial sector (Lin 2015; Lin and Tomaskoic-Devey 2013; Roberts and Kwon 2017; Flaherty 2015; Roberts and Kwon 2017; Hyde, Vachon, and Wallerstein 2018; Godechot 2016; Philippon and Reshef 2013; Denk 2015). Accordingly, the ‘financial wage premium’ is an important distributional mechanism for understanding the growth

of top incomes in advanced economies. However, while this wage premium has been documented in case studies of the U.S. (Lin 2015), U.K. (Bell and Van Reenen 2013), and France (Godechot 2012), it is unclear whether: (1) the financial wage premium varies across advanced economies and (2) what explains variation in the financial wage premium.

The present study addresses these empirical gaps by examining the magnitude and location of the financial wage premium across the upper end of the labor income distributions in 13 advanced economies over the last few decades. The results show financial employment substantially increases top labor incomes in advanced economies and this population-level effect is primarily explained by a wage premium in the financial sector. We find this wage premium is greatest at the 90<sup>th</sup> and 95<sup>th</sup> percentiles of labor income where the highest paid labor in the financial sector earns substantially more than top earners in non-financial sectors. Additionally, the results show the financial wage premium at the 95<sup>th</sup> percentile expanded at a greater rate than the median financial wage premium. Accordingly, this study offers novel evidence on the cross-national heterogeneity in the financial wage premium to better understand the growth of top incomes and top wage inequality in advanced economies.

Macro-comparative studies consistently show financialization exerts heterogeneous effects on wage inequality in advanced economies. However, this research has yet to investigate how the market structure of financial systems accounts for heterogeneity in the distributional mechanism linking financialization to top incomes. The market organization, coordination, and governance of financial systems should theoretically contribute to the growth of top incomes by amplifying the ability of financial labor to leverage their non-proprietary human and social capital in obtaining greater remuneration from their employers (Godechot 2012; 2016; 2020). However, despite this strong theoretical argument, comparative research on financialization has yet to

determine whether the development of financial markets increases the financial wage premium in advanced economies. This study addresses this important gap by showing how the financial wage premium is partially driven by the development of financial markets.

Overall, the results of the study support prior case studies by showing financialization increases the wages and salaries of top earners in financial sectors relative to earners in non-financial sector. More importantly, we show this wage premium in the financial sector varies across countries with a larger premium in countries with highly developed financial markets. Additionally, we find the growth of the financial wage premium at the 95<sup>th</sup> percentile strongly coincided the growth of financial markets in advanced economies. Panel models of the financial wage premium confirm this cross-national and longitudinal association between financial market development and the financial wage premium at the upper end of the distribution even when accounting for financial institution development, financial deregulation, unionization, and nonmarket wage-setting. These findings show the utility of applying a comparative distributional analysis to investigate how financialization contributed to the growth of top incomes in advanced economies. Accordingly, we elucidate an important distributional mechanism linking financialization to the distribution of labor income and how this mechanism is driven by the development of financial markets.

In general, these findings contribute to extant literature in two ways. First, we show the population- and individual-level effects of financial employment helps explain the relative growth of top incomes in 13 advanced economies. More importantly, we show a high degree of cross-national variation in these effects. As such, we provide the most extensive evidence of the financial wage premium in the extant literature. Additionally, we show the financial wage premium differently contributes to the dynamics of wage inequality in advanced economies. This

illustrates the importance of the financial wage premium in accounting for the growth of top incomes and wage inequality in advanced economies during a period of intensive financialization.

Despite the contributions of this study, it is important to note two important limitations. First, while we contend the ‘hold-up’ mechanisms explains the wage premium and variation in this premium, the international mobility of financial workers should also be considered. High skilled labor in the financial sector is internationally mobile and able to relocate to the highest paying firms in countries with more developed financial markets. The heterogeneity in financial market development across countries would be a key driver of labor migration as highly mobile workers seek higher remuneration. Future studies should utilize international employer-employee matched data to investigate how mobility affects the wage premium.

Second, we show the market structure of financial systems is important for understanding the impact of financialization on top incomes. However, the cross-national design of the present study does not causally test the association between macro-level financial market development and the size of the financial wage premium. As an alternative explanation, higher national financial market development generates larger amounts of resources in the financial sector that can be captured by the domestic firms. In turn, finance professionals in the US, the UK, and Switzerland might be highly remunerated simply because more money is ‘flying around’ in their financial sectors. Subsequent studies should explore these mechanisms in further detail by disaggregated the premium across different financial industries and occupations.

In summary, the present study provides novel comparative evidence on the financial wage premium to further explore the link between financialization and top incomes. Findings

from the study point toward the need to account for the market development of financial systems in creating effective policies for economic equity. Specifically, with the rising prominence of finance-based profit-making in advanced economies, this study shows the need to regulate financial markets and to institutionalize stakeholder decision-making in the financial sector which may play an important role in mitigating divestment in labor in non-financial sectors and excessive compensation in financial industries.



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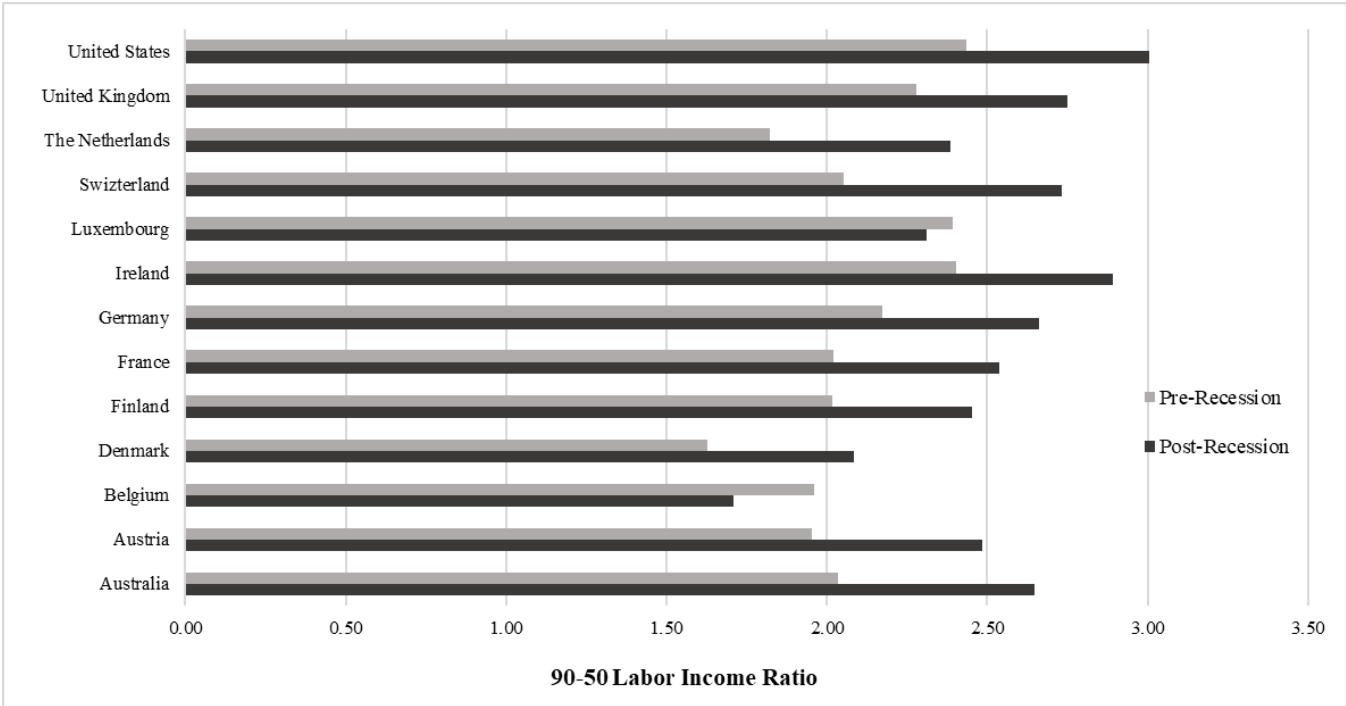
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<https://www.csef.it/WP/wp600.pdf>

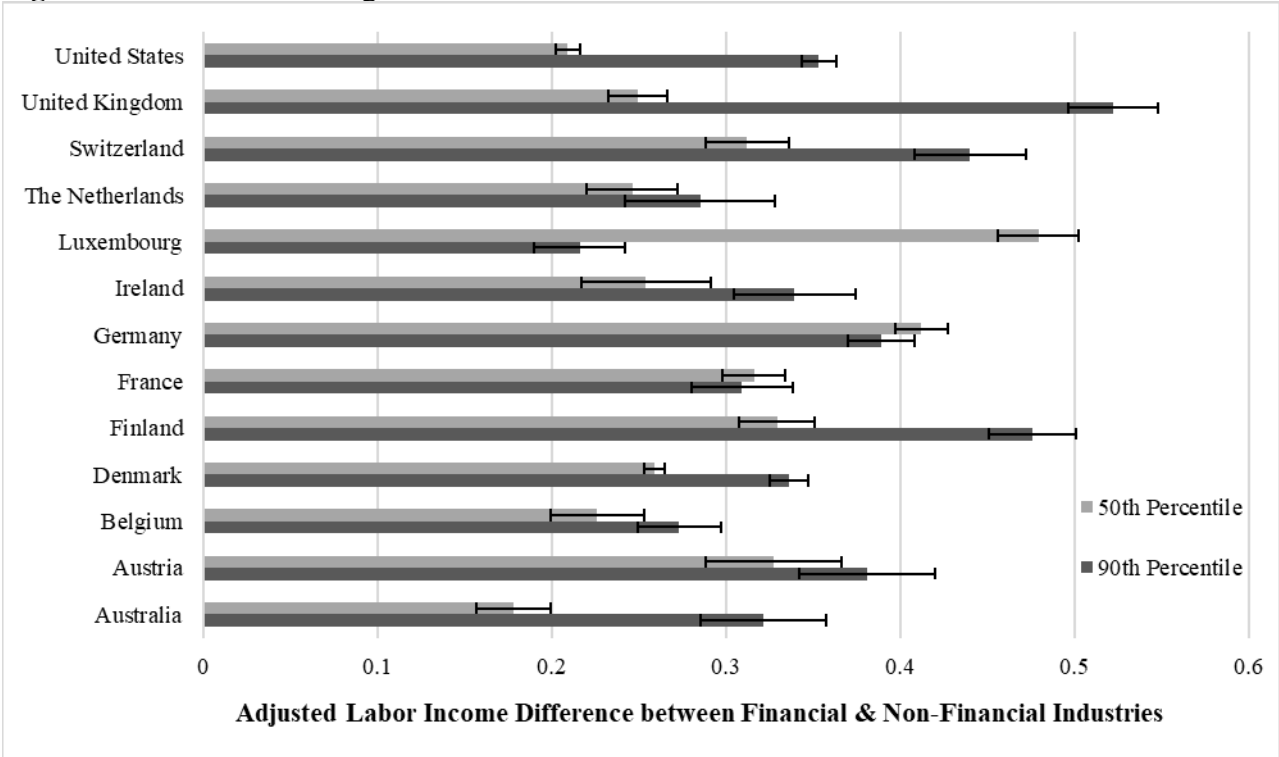
**Figure 1.** Top Incomes in 13 OECD Countries Before & After Great Recession



**Note:** Pre-Recession defined as period between 2000-2006 and post-recession defined as period from 2010-2016.

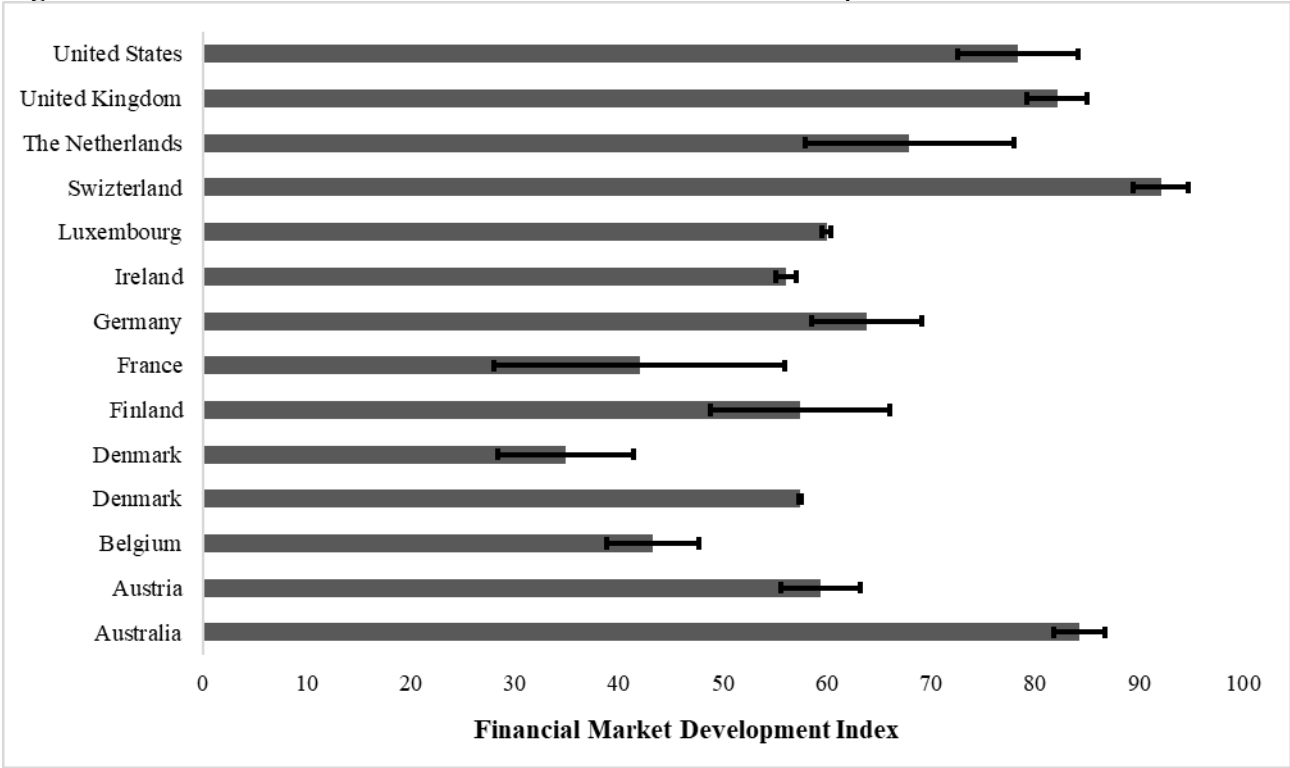
**Source:** Luxembourg Income Study Microdata.

**Figure 2.** The Financial Wage Premium at 50<sup>th</sup> & 90<sup>th</sup> Percentile of Labor Income



**Note:** 95% confidence intervals shown. Estimates adjusted for age, gender, marital status, occupation, and year. Estimates derived using unconditional quantile treatment effects (Firpo 2007).  
**Source:** Luxembourg Income Study Microdata.

**Figure 3.** Cross-National Differences in Financial Market Development in 13 OECD Countries

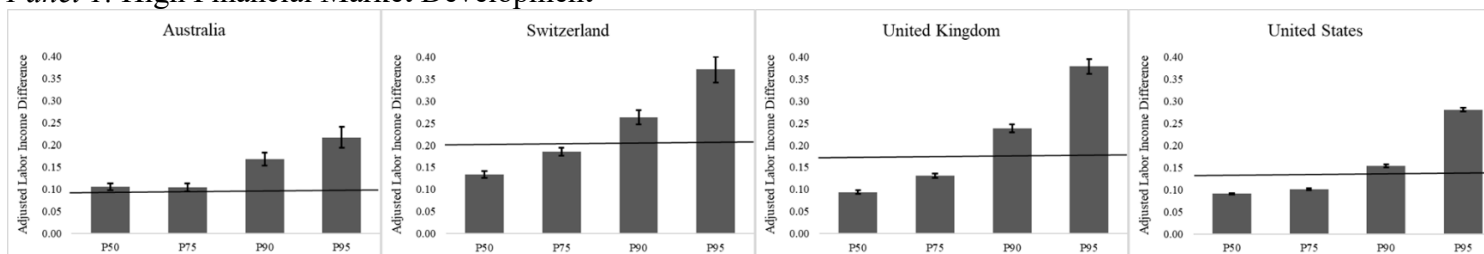


Note: 95% confidence interval shown.

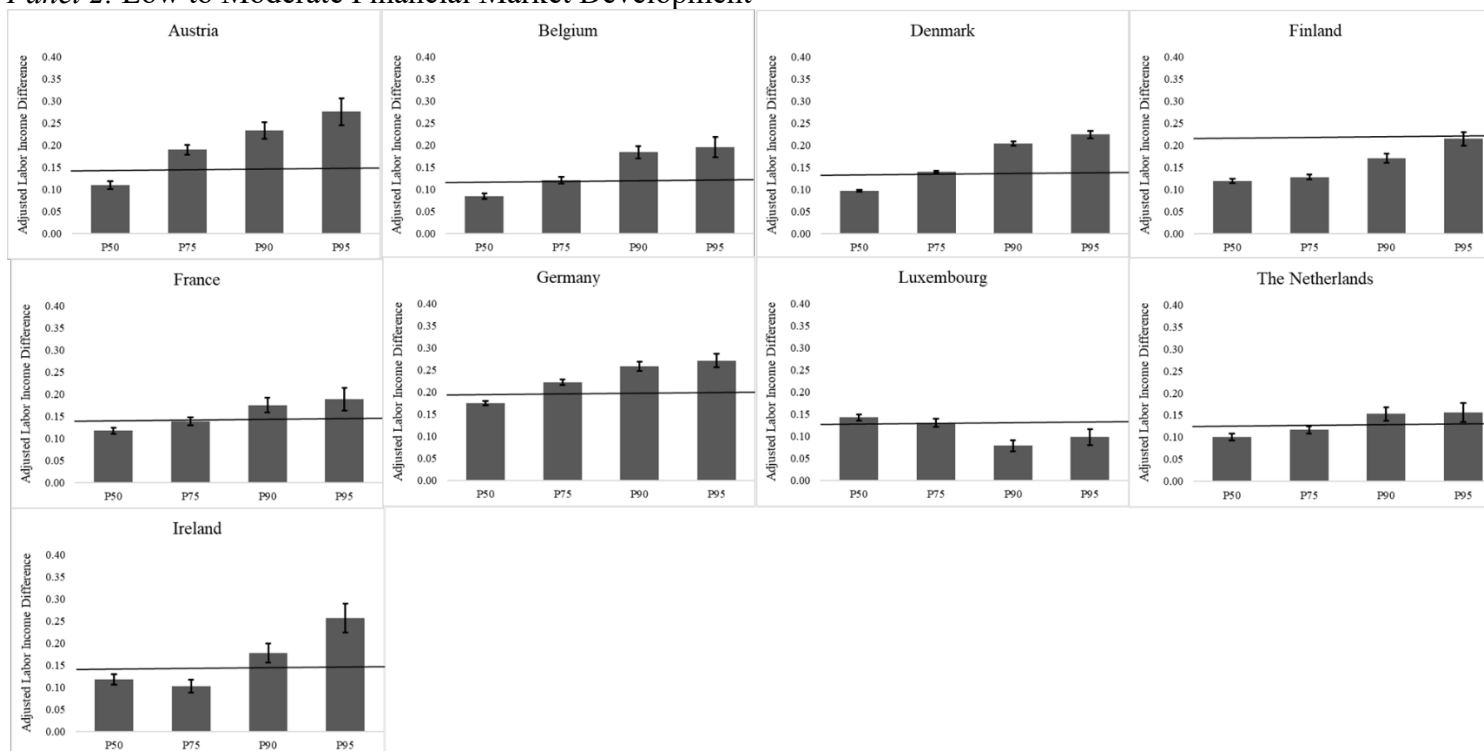
Source: Financial Development Index Database (IMF 2019)

**Figure 4.** Population-Level Effect of Financial Employment on Top Labor Incomes in 13 OECD Countries

*Panel 1.* High Financial Market Development



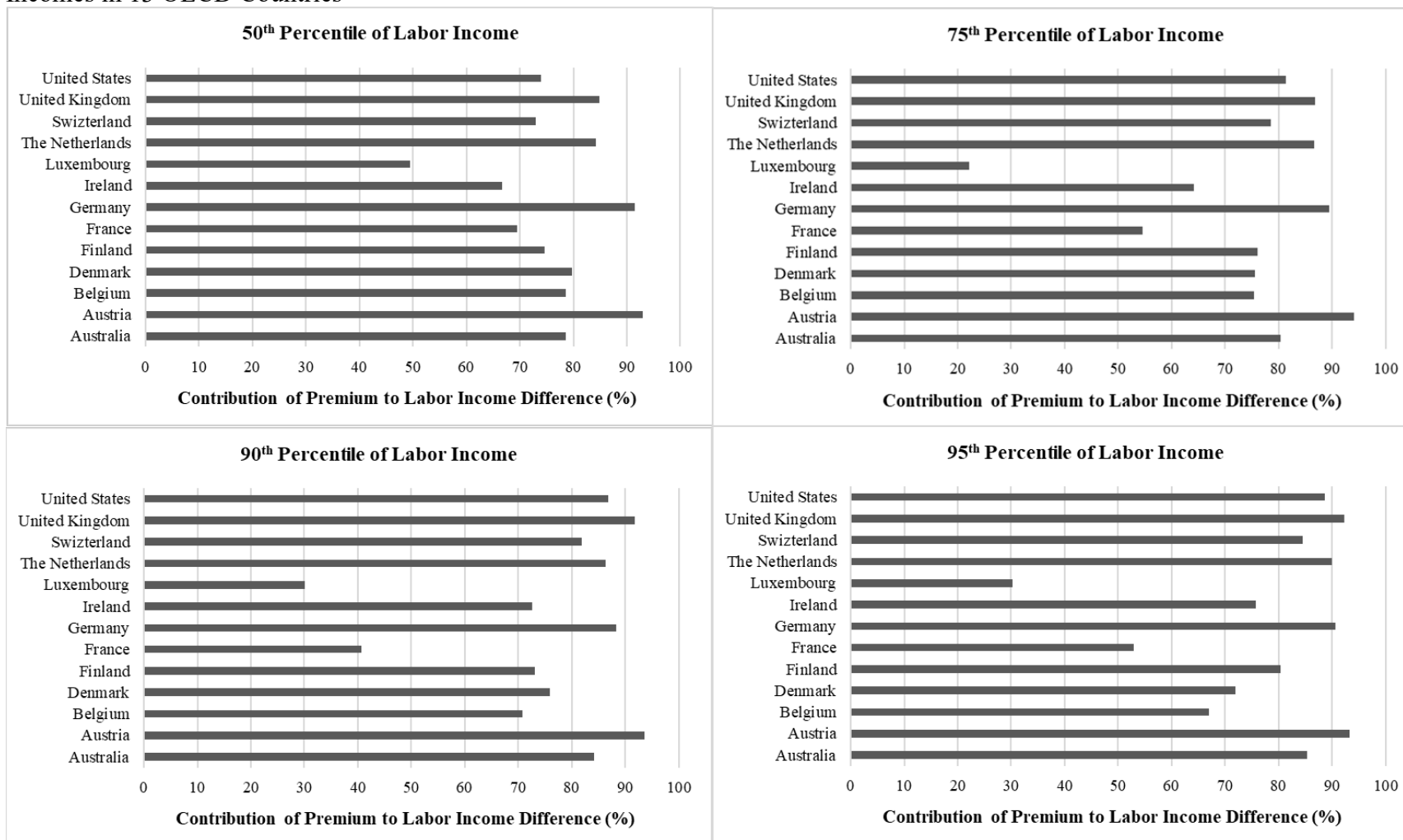
*Panel 2.* Low to Moderate Financial Market Development



**Note:** High financial market development defined by a score above third quartile. Solid line = average labor income difference. Estimates adjusted for age, gender, marital status, and occupation and derived from recentered influence function regression (Firpo et. al 2009).

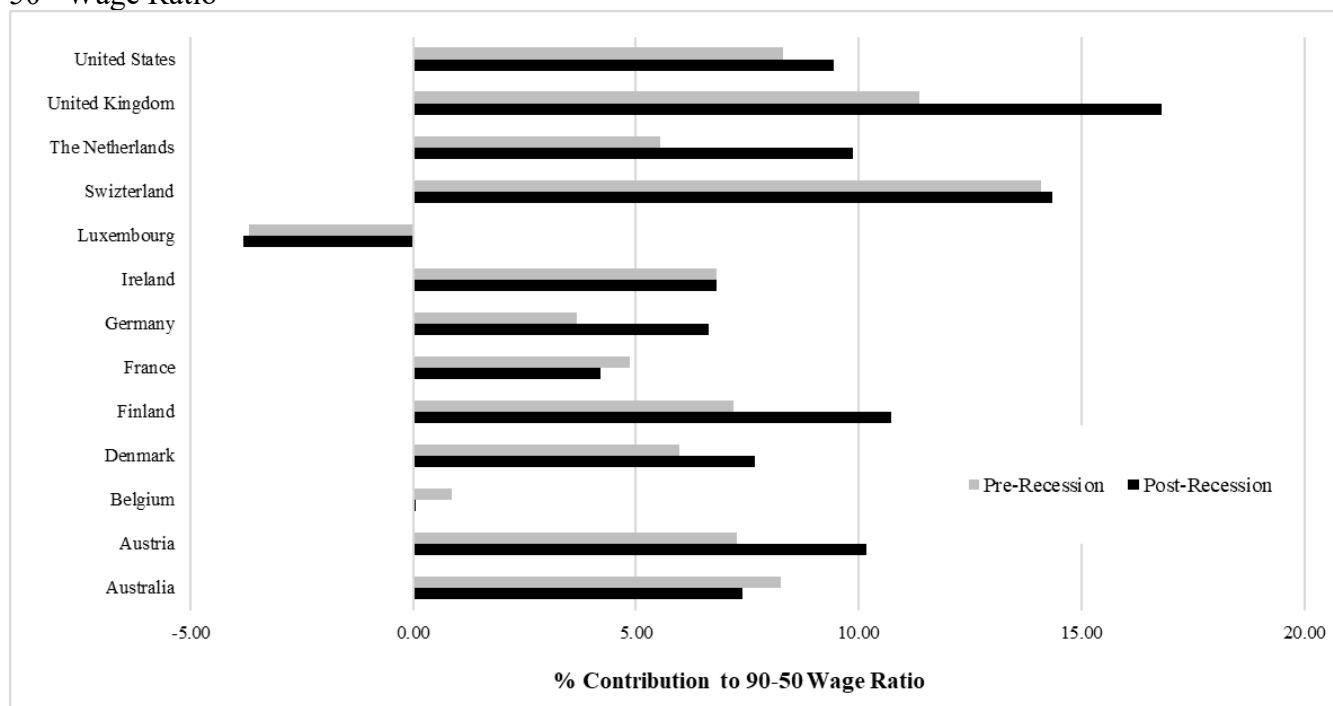


**Figure 5.** Contribution of the Financial Wage Premium to Observed Population Effects of Financial Employment on Top Labor Incomes in 13 OECD Countries



**Note:** Contributions derived from the unexplained portion of an Oaxaca-Blinder decomposition of recentered influence function regression estimates.

**Figure 6.** Contribution of the Population-Level Effect of Financial Employment to the 90<sup>th</sup> to 50<sup>th</sup> Wage Ratio

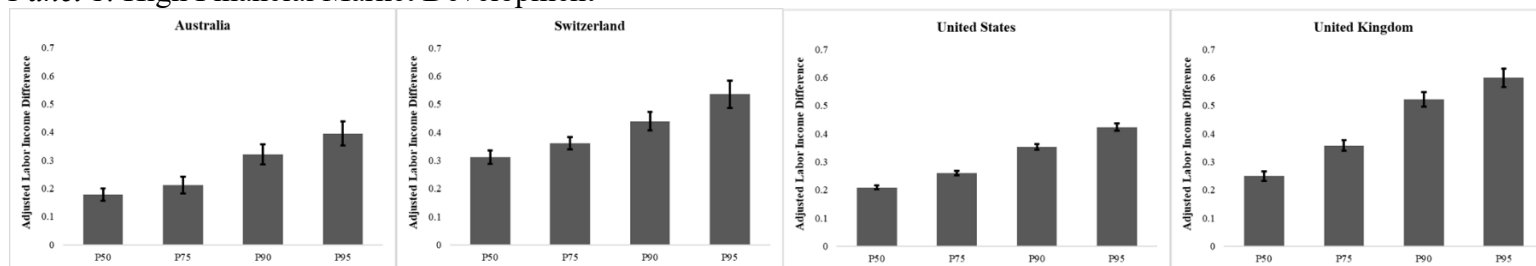


**Note:** Contributions are based on RIF regression models of the 90<sup>th</sup> to 50<sup>th</sup> labor income ratio ( $\beta_{90-50}$ ), the 90<sup>th</sup> percentile of labor income ( $\beta_{90}$ ), and the 50<sup>th</sup> percentile of labor income ( $\beta_{50}$ ). The contribution is measured with the following equation:  $(\beta_{90-50} + (\beta_{90} - \beta_{50})) / \text{Observed 90-50 Wage Ratio}$ . Pre-Recession defined as period between 2000-2006 and post-recession defined as period from 2010-2016.

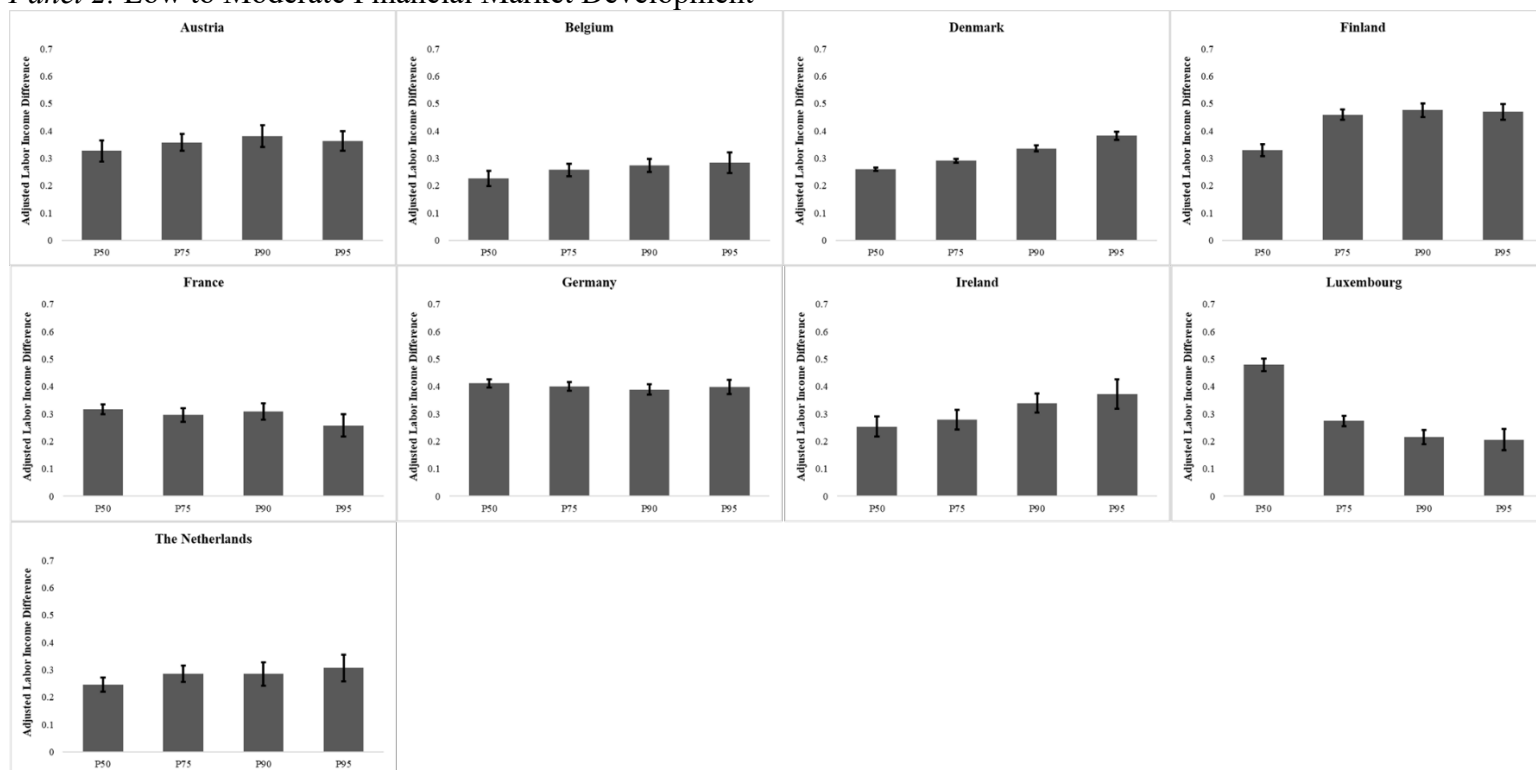
**Sources:** Luxembourg Income Study Microdata

**Figure 7.** The Financial Premium for Top Labor Incomes in 13 OECD Countries

*Panel 1.* High Financial Market Development

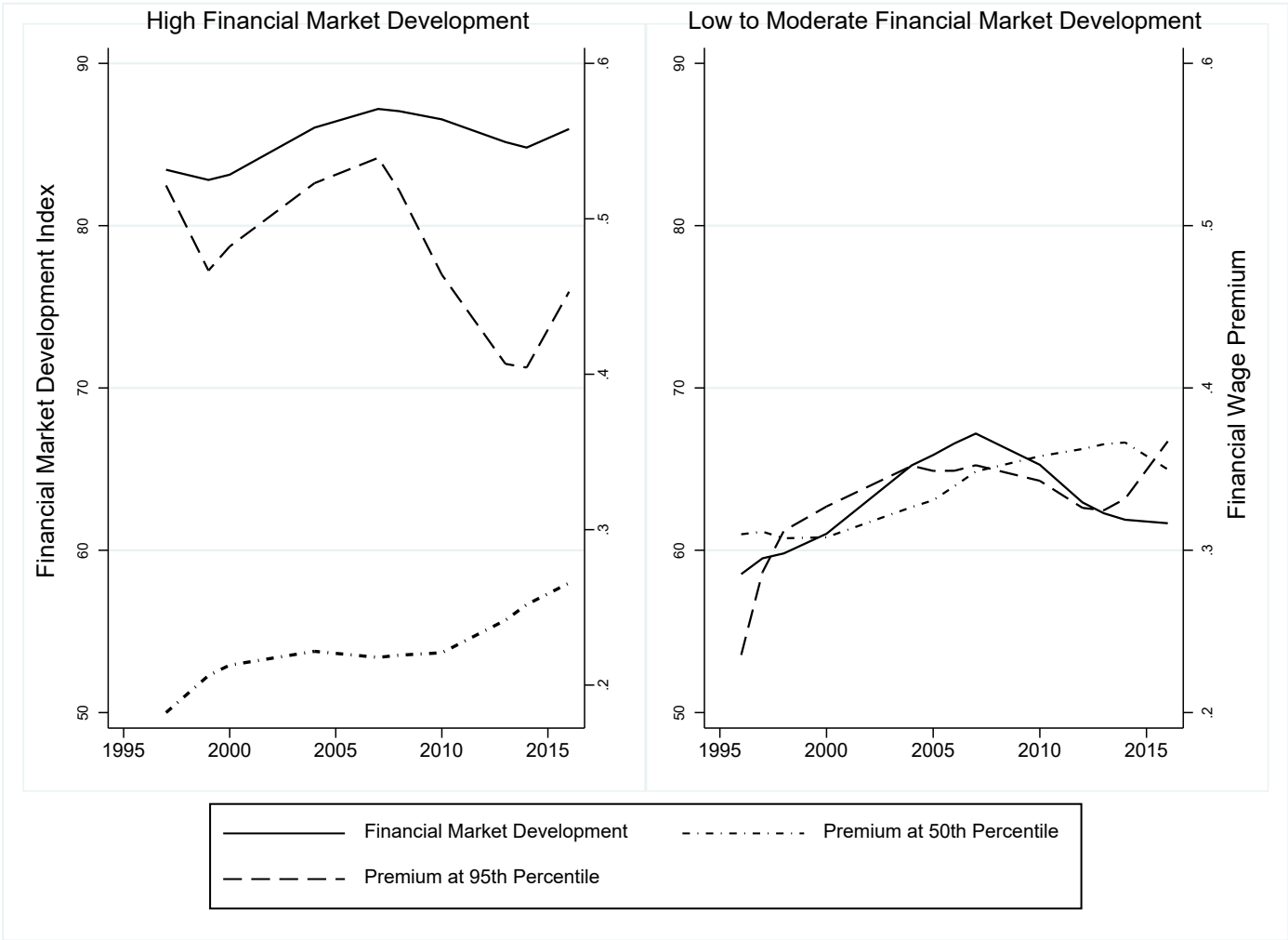


*Panel 2.* Low to Moderate Financial Market Development



**Note:** High financial market development defined by above third quartile. Estimates adjusted for age, gender, marital status, occupation, and year. Financial wage premiums derived from unconditional quantile treatment effect estimation (Firpo 2007).

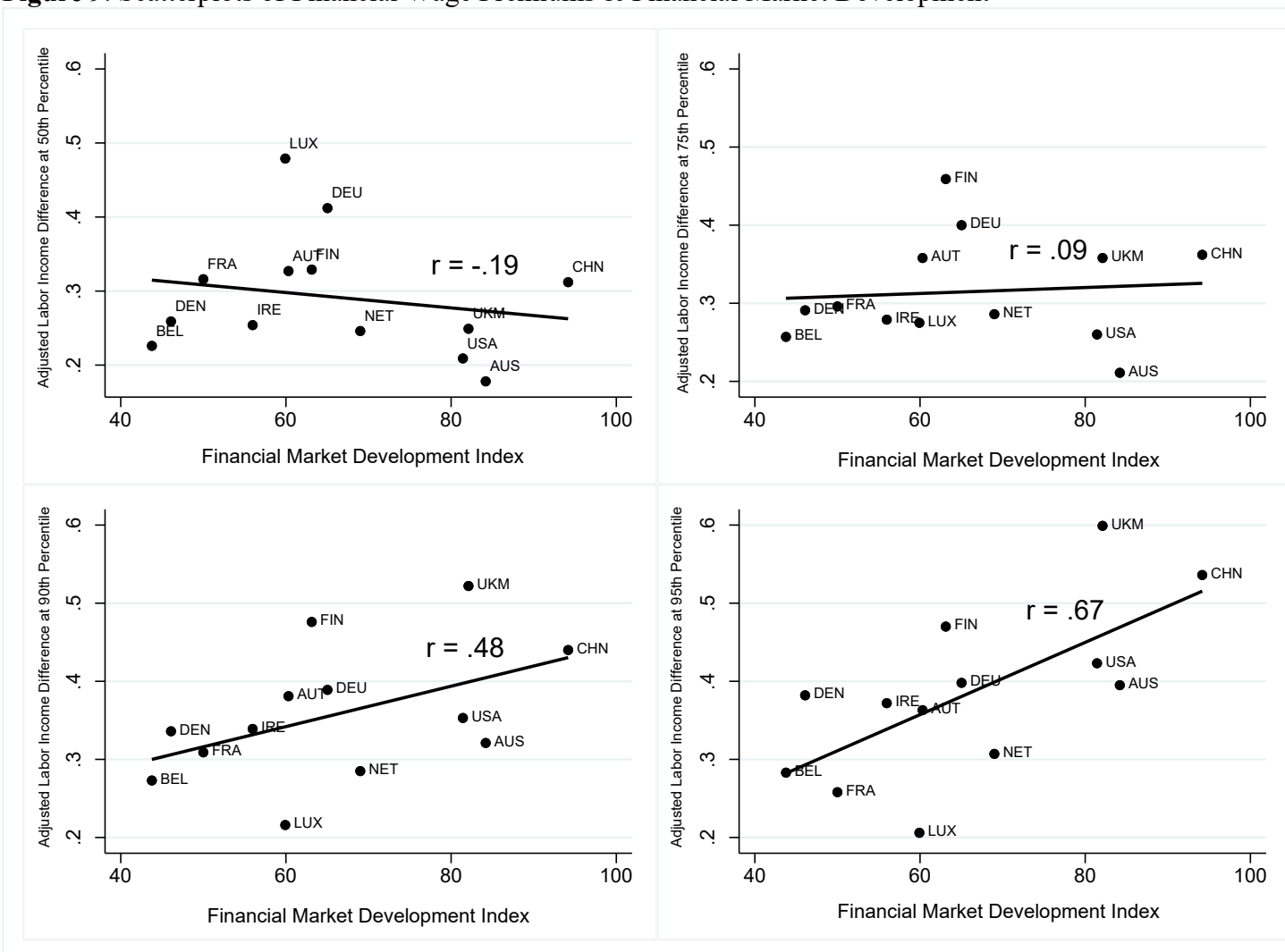
**Figure 8.** Locally Weighted Time Trends of Financial Market Development & Wage Premiums



**Note:** Trends estimated with locally weighted smoothed regression (LOWESS). Financial wage premiums estimated with unconditional quantile treatment effects (Firpo 2007).

**Sources:** Luxembourg Income Study Microdata; Financial Development Index (IMF 2019)

**Figure 9.** Scatterplots of Financial Wage Premiums & Financial Market Development



**Note:** Pearson correlation (r) reported. Line fit derived from linear regression. Estimates of the financial wage premium derived from unconditional quantile treatment effect estimation (Firpo 2007).

**Sources:** Luxembourg Income Study Microdata; Financial Development Index Database (IMF 2019).

**Table 1. Outcome & Covariates in Respondent- & Country-Level Analyses**

	Mean	SD	Description	Source
<i>Respondent-Level</i>				
Personal Labor Income	47194.26	51784.83	Total income from work, including cash payments and value of goods and services received from dependent employment. Constant 2010 USD.	LIS
Employed in Finance	0.04		Respondent employed in financial intermediation. Based on LIS 9-category industry coding.	LIS
Managerial & Professional Occupation	0.30		Respondent employed in manager or professional job (ISCO 1 & 2)	LIS
Skilled Occupation	0.62		Respondent employed in skilled job (ISCO 3-8, 10)	LIS
Unskilled Occupation	0.08		Respondent employed in labor or elementary work (ISCO 9)	LIS
Low Educational Attainment	0.15		Less than upper secondary education completed (never attended, no completed education or education completed at the ISCED 2011 levels 0, 1 or 2)	LIS
Medium Educational Attainment	0.48		Upper secondary education completed or post-secondary non-tertiary education (completed ISCED 2011 levels 3 or 4)	LIS
High Educational Attainment	0.37		Tertiary education completed (completed ISCED 2011 levels 5 to 8)	LIS
Age	40.64	11.60	Age in years	LIS
Male	0.53		Self-classified gender (reference = female)	LIS
Married	0.61		Self-classified marital status, as provided in relation to the marriage laws or customs of the country (Reference = not married, never married, divorced, separated, widowed, single)	LIS
<i>Country-Year Level</i>				
Financial Market Development	68.48	16.68	Normalized index of indicators measuring financial market depth, access, and efficiency.	IMF 2019
Financial Institution Development	81.20	9.59	Normalized index of indicators measuring financial institution depth, access, and efficiency.	IMF 2019
Financial Deregulation	75.65	11.05	Normalized index of indicators measuring the extent of government regulation of financial services; the degree of state intervention in banks and other financial firms through direct and indirect ownership; the extent of financial and capital market development; government influence on the allocation of credit; & openness to foreign competition.	Heritage 2019
Wage Coordination	3.11	1.41	Ordinal index of wage coordination with 5 categories: 1 - fragmented wage bargaining, confined largely to individual firms or plants; 2 - mixed industry- and firm-level bargaining, with little or no pattern setting and relatively weak elements of government coordination such as setting of basic pay rate or wage indexation; 3 - industry-level bargaining with somewhat irregular and uncertain pattern setting and only moderate union concentration; 4 - centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, without a peace obligation; & 5 - centralized bargaining by peak confederation(s) or government imposition of a wage schedule/freeze, with a peace obligation	Visser 2019
Union Density	33.96	20.13	Union membership rate conveys the number of trade union members who are employees as a percentage of the total number of employees in a given industry or country	Visser 2019

**Note:** Respondent N = 1,665,581; Country-Year N = 67. LIS = Luxembourg Income Study Microdata.

**Table 2.** Estimated Dependent Variable Models of the Financial Wage Premium with Random & Fixed Effects

	1	2	3	4	5	6	7	8
	<i>P50</i>	<i>P75</i>	<i>P90</i>	<i>P95</i>	<i>P50</i>	<i>P75</i>	<i>P90</i>	<i>P95</i>
Financial Market Development	-.028 (.209)	.201** (.075)	.241* (.103)	.317** (.121)	.120 (.289)	.194** (.069)	.142+ (.081)	.218* (.093)
Financial Institution Development	-.138 (.151)	-.101 (.166)	-0.145 (.189)	.107 (.211)	.007 (.222)	-.120 (.265)	-.188 (.277)	.035 (.413)
Financial Deregulation	-.257*** (.079)	-.206 (.126)	-.012 (.186)	.061 (.255)	-.240*** (.076)	-.142 (.169)	-.050 (.212)	-.010 (.320)
Wage Coordination	-2.466 (1.648)	.130 (.902)	-.824 (.751)	-2.350 (1.453)	-4.304** (1.487)	-.327 (.944)	-.076 (.761)	-1.276 (1.235)
Union Density	-.036 (.102)	.101 (.078)	-.019 (.125)	-.164 (.116)	-1.569** (.590)	.254 (.370)	-1.052** (.396)	-1.613** (.552)
Linear Time Trend	.440** (.195)	.157 (.160)	.196 (.231)	.433 (.327)	-.251 (.256)	.195 (.244)	-.236 (.230)	.644* (.316)
Constant	-814.6** (385.2)	-278.3 (328.7)	-355.4 (467.4)	4.583 (660.8)	599.9 (518.0)	-362.8 (492.6)	556.7 (465.5)	1,381** (624.8)
Country RE or FE?	RE	RE	RE	RE	FE	FE	FE	FE
Longitudinal R <sup>2</sup>	.34	.17	.19	.14	.46	.18	.16	.25
Cross-National R <sup>2</sup>	.28	.40	.25	.29	.	.	.	.

**Note:** n=67 Country-Years; N=13 Countries. Clustered standard errors in parentheses. RE – Random effects; FE – Fixed effects. All models including a parameter measuring the sampling error of the estimated financial wage premium.

**Appendix 1. Sample Composition by Country-Year**

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<b>Country</b>	<b>Years</b>	<b>Sample Size</b>
Australia	1985, 2004, 2008, 2010, & 2014	61,721
Austria	2004, 2007, 2010, 2013, & 2016	24,406
Belgium	1995, 2000, 2004, 2007, 2010, 2013, & 2016	29,753
Denmark	1987, 1992, 2004, 2007, 2010, 2013, & 2016	351,760
Finland	1987, 1991, 1995, 2000, 2004, 2007, 2010, 2013, & 2016	100,936
France	1984, 1989, 2005, & 2010	30,927
Germany	1984, 1987, 1989, 1998, 2004, 2006, 2010, 2012, 2014, & 2016	105,378
Ireland	1994, 1996, 2000, 2004, 2007, 2010, 2012, 2014, & 2016	33,570
Luxembourg	1997, 2000, 2004, 2007, 2010, & 2013	23,430
The Netherlands	1990, 2004, 2007, 2010, & 2013	23,521
Switzerland	2007, 2010, 2013, & 2016	28,024
United Kingdom	1999, 2004, 2007, 2010, 2013, & 2016	130,637
United States	1986, 1991, 1994, 1997, 2000, 2004, 2007, 2010, 2013 & 2016	718,694

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**Note:** Country-year samples were selected based on the availability of variables and data before and after the Great Recession.

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**Appendix 2. Cross-National Correlations & VIF of Covariates**

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	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
Premium at 50 <sup>th</sup> (1)	1.00								
Premium at 75 <sup>th</sup> (2)	0.42	1.00							
Premium at 90 <sup>th</sup> (3)	0.09	0.69	1.00						
Premium at 95 <sup>th</sup> (4)	-0.04	0.56	0.83	1.00					
Financial Market Development (5)	-0.13	0.23	0.38	0.47	1.00				
Financial Institution Development (6)	-0.14	-0.31	0.05	0.20	0.26	1.00			
Financial Deregulation (7)	-0.44	-0.38	0.01	0.13	0.12	0.46	1.00		
Wage Coordination (8)	0.06	0.04	-0.26	-0.34	-0.58	-0.41	-0.20	1.00	
Union Density (9)	-0.20	-0.01	-0.17	-0.16	-0.55	-0.43	0.13	0.51	1.00
Variance Inflation Factor					1.83	1.93	1.66	1.79	2.24

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