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The Marriage the Merrier: Examining the Role of Family Labor Supply in Consumption Inequality

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Abstract

Using data from the Panel Study of Income dynamics between 2009 and 2019, I first document that the disconnect between consumption and earnings inequality holds for married households but not single households. Married households seem to behave consistently with the Permanent Income Hypothesis, smoothing out their consumption based on their expected lifetime incomes. In contrast, single households' consumption is strongly correlated with their labor incomes, suggesting that their consumption behavior is based on their current income levels. I then quantitatively discuss the possible explanatory factors for these different types of behavior. Much of prior economic research on economic inequality has emphasized the role of financial markets, focusing on credit markets and borrowing. However, recent evidence suggests that tools within the household's boundaries are crucial for smoothing out consumption. Blundell et al. (2016) found strong evidence of smoothing in the case of permanent wage shocks, emphasizing the importance of family labor supply. Because the only systematic difference between the two samples is their respective marital status, I claim that the latter insurance mechanism plays a vital role in households' consumption smoothing process and not only the former.

Keywords: Economic Inequality, Family Labor Supply, Consumption Smoothing

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1. Introduction

Economic inequality and its implications is a topic that has been widely discussed ever since the field of modern macroeconomics was established by John Maynard Keynes at the beginning of the 20th century. Traditional economic scholars advocated that economic inequality was a prerequisite for economic growth and prosperity. Since then, much empirical evidence has been collected against this fundamental concept (see, for example, Deininger and Squire, 1996). Today, the consensus view within economics and other social science fields is that high levels of inequality are harmful to a country's overall welfare.

Fortunately, economic inequality between countries has decreased over the last three decades. Global inequality, defined as the sum of inequality between and within countries, has declined slightly but remains high. However, inequality within countries has grown during this period (Milanovic, 2016).

One country that arguably has been at the center of this development is the United States, in which income inequality continues to widen, whether measured as the gaps in income or wealth between richer and poorer households. This trend started in the 1970s and has magnified since the millennial shift (Heathcote et al., 2010). As a logical consequence of this development, economic inequality has been subject to much research focus in more recent years. Much of the literature on this topic has focused on income inequalities (see Gottschalk and Moffitt, 2009).

However, if one is interested in economic inequality from a welfare perspective, merely looking at current income might not be sufficient. This potential divergence sparked the inspiration for the study conducted by Krueger and Perri (2006). They showed that the recent growth in income inequality had not been matched by a corresponding increase in consumption inequality. This disconnect appears in the data due to the mechanisms behind consumption smoothing, built on the permanent income hypothesis. Households have access to different insurance mechanisms that make it possible to ensure stable consumption patterns in cases of adverse income shocks (Friedman, 1957; Hall, 1978). Hence, there is a strong case for economists and other social scientists to look beyond income inequality and consider consumption inequality a critical factor in determining a country's prosperity.

When addressing consumption inequality and why it differs from income inequality, researchers often refer to the importance of financial markets. For example, the model constructed by Storesletten et al. (2004) explains consumption and risk sharing over the life cycle. Their paper suggests that individual-specific earnings risk can provide a coherent explanation as to why

inequality increase with age. This is an addition to the body of evidence suggesting that labor market risks are imperfectly insured via credit and that a precautionary motive is an essential aspect of U.S savings behavior.

Less work has been focused on the role of the labor market in ensuring stable consumption patterns. However, recent evidence suggests that households do not first and foremost utilize external insurance channels to cope with income variability. Instead, mechanisms within the boundaries of the household are more common. Blundell et al. (2016) found strong evidence of smoothing in the case of permanent wage shocks, emphasizing the importance of family labor supply.

In summary, the data tells us that income inequality in the United States has been rising over the last decades. However, this trend can primarily be explained by a top-end tilt in incomes, whereas consumption expenditures have not changed as much. Despite unstable income streams, the theoretical narrative explaining this diversion relies on consumption smoothing, allowing households to even out their consumption across time. Previous research highlights financial markets as the primary source of household insurance, even though recent evidence indicates that insurance through the labor market is critical. This finding puts an interesting perspective on the role of marital status in consumption inequality since this insurance mechanism is uniquely available only to couples households.

However, to the best of my knowledge, no previous research has examined the divergence between income and consumption inequality by looking at different household types. This is the primary focus of this paper - To explore whether or not the disconnect between consumption and income inequality holds for married couples and singles. The expectation is that the divergence will be more significant for couple households than for singles, a hypothesis built on the idea that family labor supply could explain these patterns.

Answering these questions using a comprehensive data set of over 18 000 U.S households makes it possible to evaluate the disconnect for both household types quantitatively. By doing so, the ambition is to assess the role of marital status in consumption inequality. The study will also qualitatively discuss family labor supply as a source of consumption insurance. Hopefully, this will result in a more nuanced view of the link between dynamic household behavior and economic inequality.

2. Theoretical Background

2.1. A Global Outlook on Economic Inequality

When looking at today's global economy, it is relatively straightforward to notice the significant differences in income inequality between countries. Among different measures, the Gini coefficient is arguably the most commonly used method to understand how income is dispersed within a country. This index incorporates detailed parts data on different types of households (e.g., the bottom 10%) into a single statistic, which summarises the income distribution across the entire income population. A Gini coefficient of 0 expresses perfect equality, where everyone has the same income. A Gini coefficient of 1 represents maximal inequality, where only one person holds all the income. The Gini is based on the difference between the Lorenz curve (the observed cumulative income distribution) and the notion of perfectly equal income distribution (U.S Census Bureau, 2021). This index can then be used to compare differences in income inequality between countries, a measure that varies significantly. In economies such as The Slovak and Czech Republic, Slovenia, and the Scandinavian countries, the index takes on values between 0.22 and 0.28. Countries like South Africa, Costa Rica, and Chile are represented on the opposite end, obtaining values between 0.46 and 0.62. It is noticeable that more prosperous economies tend to be more equal than countries in the developing world. One exception to this trend is the United States, displaying a Gini index of 0.40, despite being the most prosperous economy in the world (OECD, 2022).

Another possible way to measure economic inequality within a country is the 90/10-ratio (also called the Decile dispersion ratio), which measures the ratio between the upper bound value of the ninth decile (i.e., the 10% of the population with the highest income) to that of the first decile (Afonso et al., 2015). This ratio is lowest among the Scandinavian countries and highest in rural African countries such as Sierra Leone. According to this measure, the United States holds an intermediate position but should be considered an outlier also in this regard when considering the country’s relative richness (World Bank, 2020).

Moreover, data shows that relative global inequality (measured by the Gini coefficient) has declined consistently over the past decades, from 0.739 in 1975 to 0.631 in 2010. This evolvement has primarily been driven by declining inequality in developing regions due to extraordinary economic growth in fast-developing countries, such as China and India. This development has occurred despite an increasing inequality trend within countries (Niño-Zarazúa et al., 2016). However, when measured in absolute terms, global equality has increased dramatically during the same period. In contrast to the relative indicators mentioned above, fundamental measures show a

change in inequality even when all individuals in a country experience the same relative shift in income. For instance, relative inequality would not be affected if incomes for all people (or households) rise by 5%. However, a 5% increase for someone who earns $200,000 is much more in absolute money terms than someone who earns $50,000. Therefore, measuring inequality in complete terms is valuable, especially when analyzing how economic inequality has developed over time (United Nations University, 2019). As Niño-Zarazúa pointed out in their paper, the absolute gaps in income between countries are much higher than 40 years ago.

2.2. Economic Inequality in the United States

The country that has stood at the forefront of this development is arguably the United States. There are several reasons for this. The most apparent one is that the U.S is the largest and most influential country worldwide and thus receives much attention, regardless of the current state of its economy. Another contributing reason is that income inequality in the United States is more significant than in other advanced economies. Perhaps more striking is how economic inequality has developed in the country, particularly during the last decades.

The recent income growth has tilted towards upper-income households whereas middle-class incomes have not grown at the same rate as incomes in the upper class. From 1970 to 2018, the median income for the middle class increased from $58,100 to $86,600, a gain of 49%. This growth was significantly less than the 64% increase for the upper-income households, whose median income increased from $126,100 to $207,400 during the same period. Lower-income households experienced a gain of 43%, from $20,000 in 1970 to $28,700 in 2018 (United States Census Bureau, 2019).[1] Paired with this, the wealthiest households in the U.S have experienced the most significant growth among all income groups. This trend bolsters the growing concentration of financial resources at the top. The wealthiest families are also the only group to have experienced an increase in wealth following the Great Recession in 2007-08. From that point up to 2016, the median net worth of the upper fifth of the income distribution increased by 13%, to $1.2 million. In comparison, the net worth of families in the lower tiers of wealth decreased by at least 20% during the same period (Pew Research Center, 2020).

As a logical consequence of this development, economic inequality in the United States has been subject to much focus and attention among economic researchers, especially since the early 1980s. For example, Bernstein and Mishel (1997) examined changes in the U.S wage structure and

[1] The U.S Census Bureau does not have an official definition of the different "socioeconomic classifications" but it does derive several measures related to the distribution of income and income inequality.

earnings inequality. They find that overall wage inequality and educational wage differentials have expanded dramatically since the 1970s. On a similar note, Heathcote et al. (2010) found that changes in the distribution of hours worked sharpened the increase in earnings inequality before 1982 but mitigated its growth. Taxes and transfers are shown to compress income inequality, particularly at the lower ends of the income distribution, but have a marginal effect on the overall trend. Also, constrained access to financial markets has arguably limited both the level and growth of consumption inequality. Gottschalk and Moffitt (2009) studied the underlying factors behind the rising inequality of earnings and family incomes in the United States between the 1970s and the 1990s. They argue that this development could reflect a rise in the disparity of permanent incomes, an increase in earnings instability, or some fraction of both. Using longitudinal measures that divide changes in income inequality into these two components, they establish that earnings instability is considerably higher nowadays than in the mid-1970s.

2.3. The Extensive Research on Income Inequality

2.3.1. Classical and Neoclassical Theories

Despite the extensive literature on the relationship between income inequality and economic growth, there have been different views on how inequality impacts a country's welfare. The classical and neoclassical theories advanced that inequality benefits economic development (Galor, 2009). The main argument is that an increase in wealth leads to a higher marginal propensity to save. Thus, inequality would lead economic resources to those people whose marginal propensity to save is higher. These individuals would then be expected to take actions that lead to growth-enhancing effects for the economy, such as increases in aggregate savings, capital accumulation, and capital growth (Stiglitz, 1969). This hypothesis was later implicitly rejected by the representative agent paradigm that had been a critical concept in macroeconomics (i.e., the 'typical' decision-maker did not exist). The influential neoclassical approach dismissed the presence of heterogeneity and thus the distribution of income for macroeconomic analysis. Consequently, the observed relationship between inequality and economic growth was essentially interpreted as capturing the growth process's effect on income distribution. These findings can be traced to Kuznets (1955)' theory on inequality and economic development, hypothesizing that the relationship trajectory would resemble the shape of an inverted U.

2.3.2. The Modern Perspective

Since the neoclassical approach was first presented, much evidence has been collected against these theories. For example, Huang et al. (2011) tested the hypothesized relationship between income inequality and growth using annual US data from 1917 to 2007. Inconsistent with what Kuznets proposed, their results overwhelmingly reject the combined null hypothesis of an inverted-U relationship in favor of a regular U-shaped connection between income inequality and economic development. Deininger and Squire (1996) studied this relationship using a large-scale cross-country and time-series data set. They find no evidence that income inequalities are a prerequisite for economic development. Instead, they highlight a significant relationship between initial income inequality and subsequent economic development. Thus, they find that less inequality is conducive to economic growth. The neoclassical approach has been challenged in later years by acknowledging these findings.

Instead of the hypothesized causation from development to distribution, both theory and evidence have demonstrated that income distribution plays an essential role in the growth process. As a result of these discoveries, a more modern perspective has been developed, built on the ideas originated by Galor and Zeira (1993). In contrast to the representative agent approach, Galor and Zeira analyzed the role of heterogeneity as a determinant of macroeconomic activity. They advanced the notion that heterogeneity (and thus income distribution) is integral in determining economic activity. Their research suggests that under real-world conditions (i.e., fixed costs in the acquisition of human capital and imperfect capital markets), the distribution of income plays a vital role in determining the effects on investments in human capital, aggregate income, and economic development (Galor and Moav, 2004). Moreover, in contrast to the Classical hypothesis, which stresses the advantages of inequality for economic growth, this research suggests that income inequality could be destructive to human capital formation and economic development in imperfect credit markets.

2.4. The Case for Consumption Inequality

2.4.1. An Imperfect Correlation

However, if one is interested in analyzing how inequality could impact an economy's welfare, merely looking at the effect of the current income distribution may not be sufficient. Part of the reason for this is related to income fluctuations. As Blundell and Preston (1998) emphasized, a significant proportion of income variations are due to volatility in the transitory (i.e., unexpected and surprising) component. Income will be above its permanent level in good years and below it in

bad years. Because of this, current income may not be a well-fitting measure of economic resources available to individuals across their lifespan. Blundell et al. (2008) examine the link between income and consumption inequality. Their findings suggest that the same change in current income inequality could significantly impact the welfare distribution, depending on how individuals have access to credit and labor markets to compensate for these changes. It is also worth emphasizing that income is a means for consumption by definition. Suppose people have significantly higher earnings than what their consumption needs require. The marginal utility that the extra income level provides in terms of well-being is relatively tiny.

Due (but not limited) to these reasons, using income distribution as a measure of how economic welfare is dispersed across households could lead to unsatisfactory results. Consequently, several researchers have looked beyond income and earnings as measures of prosperity and instead focused on the distribution of individual or household consumption. Using data from the Consumer Expenditure Survey, Krueger and Perri (2006) show that a corresponding increase in consumption inequality has not accompanied the recent increase in income inequality in the United States. A large part of this divergence is because of different trends in within-group inequality, which have increased significantly for income but litte for consumption. More lenient credit terms have led to significant increases in income for certain groups while little for others. However, the differences in consumption patterns during the same period have stayed more or less the same.

2.4.2. The Permanent Income Hypothesis

To better understand how and why this disconnect appears in the data, it is essential to consider from which perspective households regard earning and consumption trends. Intuitively, one might expect people to consume at a proportionate level to their current income level. However, economic theory and evidence suggest that households' consumption departs from this assumption (Hall and Mishkin 1982). Instead, Hall (1978) argued that consumption should follow 'a random walk'. According to this theory, consumers deal with shifting income and try to smooth their consumption over time. At any given moment, a consumer selects their consumption based on current expectations of their lifetime income. Throughout their life, consumers modify their consumption because they receive new information that makes them adjust their expectations. Hall's theory stems from the permanent income hypothesis (PIH) developed by Milton Friedman (1957). His model states that people will spend money at a level consistent with their expected lifetime income. The level of expected lifetime income then becomes thought of as the "permanent" level of income that can be safely spent.

However, a large body of research strongly suggests that consumption patterns departure from these fundamental theories. For example, Campbell and Mankiw (2012) reexamined the consistency of the permanent income hypothesis using postwar U.S data. Their findings demonstrate that about 50% of individuals consume consistently with their current rather than their permanent income. Gourinchas and Parker (2002) argue that the permanent income hypothesis does not fit well in predicting young households' consumption behavior. Their research suggests that until their early forties, households discount the future at modest rates and are not particularly risk-averse. In contrast, these results also imply that older households actively save for retirement and behave more consistently with the permanent income hypothesis.

In theory, you could imagine two polar cases; autarky and a perfect market structure. In the first scenario, there are virtually no functioning capital markets. Thus, there is no point in saving and accumulating financial assets since there are no guarantees that these funds will be worth anything in the future. Here, in contrast to the world we live in today, it becomes perfectly rational for households and individuals to consume the full amount of money they earn due to the system's dysfunctionality. Hence, inequality between people will stay constant over time. In the opposite scenario, capital markets are working perfectly because no participant has the power to influence the price of goods and services. This market structure is characterized by costless trading and free access to financial markets, and that information about borrowing and lending opportunities is widely available to all participants. Under these circumstances, the best way for households and individuals to act is to try and smooth their consumption as efficiently as possible so that their behavior resembles the notion of the permanent income hypothesis as close as possible. In this case, inequality between people will be maximized over time. These two extreme scenarios are both hypothetical; the reality is somewhere between.

2.5. Prior Work on Consumption Inequality

2.5.1. Fundamentals of Consumption Smoothing

The theory behind consumption smoothing is based on the idea that households can take specific actions to help insulate consumption patterns from income variability. By borrowing and saving, depleting and accumulating non-financial assets, adjusting labor supply, and employing formal and informal insurance agreements, households can use several tools to make sure that they maintain a stable consumption pattern. These mechanisms work as a form of diversification for households to protect themselves against the volatility in income that follows from earning shocks (Morduch

1995). The natural question is to what extent the mechanisms come into play in a real-life setting of incomplete markets.

2.5.2.The Role of Financial Markets

Prior research argues that financial markets play a significant role in explaining why consumption patterns depart from the theories presented by Hall (1978). Studies emphasize that the expansion of consumer credit markets has made consumers more exposed to earning shocks. For example, Gross and Souleles (2002) analyze how people respond to credit supply. They find that increases in credit limits generate an immediate and significant rise in debt. On an aggregate level, Ludvigson (1999) shows that consumer credit is an essential predictor of consumption in the United States, implying a significant departure from the theory behind consumption smoothing. However, Brady (2008) examined how structural changes (e.g., deregulations, commercial bank consolidations) in consumer credit have impacted the possibilities of consumption smoothing. In contrast to research before his, consumption smoothing is evident in the data after the mid-1980s and into the 2000s.

Nonetheless, being overly reliant on financial markets to secure stable consumption in times of insecure earnings can be problematic from several perspectives. The main reason is that credit markets are, by definition, imperfect and found to be excessively sensitive to current income (see Peersman and Pozzi 2004, among others). Jappelli and Pagano (1998) found that consumption is more susceptible to current income fluctuations when individuals borrow less. The evidence suggests that lower consumer debt levels can be interpreted as an indicator of tighter credit rationing. Because risk sharing is incomplete, households cannot entirely insulate their consumption profile from income risk.

Additional problem households face with financial markets is a negative correlation between intermediation costs and household consumption loans and welfare (Antunes et al., 2012). Basically, the larger the loan, the higher the cost of that loan. This study highlights this inverse relationship specifically for household loans, but the same effect is likely to appear for other forms of consumer credit as well. The main point here is that higher discount rates limit borrowing, and hence, agents' ability to smooth consumption over time declines.

2.5.3. Risk Sharing Over the Life Cycle

Another feature observed in the U.S data is that economic inequality increases with age. To be more precise, Storesletten et al. (2004) documented that age-dependent inequality in labor earnings and consumption increases substantially between ages 23 and 60. The increase in consumption is less

than the increase in wages, and the increase in both is approximately linear. In contrast to the studies mentioned above on the limitations of credit markets, these findings are in line with the implications of the permanent income hypothesis. In the same paper, a general life-cycle equilibrium model with imperfect risk sharing is created to test if individual-specific earnings risk can provide a coherent explanation of these patterns. By accounting for uninsurable earnings shocks over households' lifetimes, their model suggests that it can. Without them, the model cannot account for the joint behavior of U.S data on consumptions and earnings inequality. This feature is essential in the earlier stages of life due to age being an inevitable aspect of labor market risk. Young people face more risk than older adults since they are subject to a higher probability of significant earnings shocks. In the sense that shocks impact both present and future earnings, high persistence is necessary to account for how inequality increases with age. However, the model overestimates how financial markets work as an insurance mechanism for households to secure stable consumption compared to the data. This flaw in the model indicates that other factors than financial markets could explain the increasing divergence between income and consumption inequality over the life cycle.

2.5.4. The Importance of Family Labor Supply

In response to the limitations of credit markets, households have turned to the labor market to compensate for volatile and insecure income levels. The idea is that instead of being reliant on borrowing to even out consumption patterns, people can increase time spent working and thus raise their total labor earnings. There is an inverse relationship between credit and labor market dependency. The better your access is to one of the two channels, the less reliant you will be on the other market to secure consumption. Bertola and Koeniger (2004) explained that smoother labor incomes alleviate credit constraints by reducing workers' desire to borrow.

A recent article published by Blundell et al. (2016) examines the role family labor supply plays in explaining self-insurance behavior. They found little evidence of additional insurance channels in the case of permanent wage chocks but instead emphasized the role of decisions within the household's boundaries. This finding implies that a large share of income inequality is primarily compensated for through additional labor and that households are not as dependent on financial markets as previous studies suggest. Therefore, couple households are less exposed to earnings shocks due to their partner's participation in the labor market. This is an insurance channel that is not available to single households, whose labor income is entirely determined by the individual's earnings.

3. Research Specification

3.1. Dividing the Divergence

This paper builds on the work of Krueger and Perri (2005) on the divergence between earnings inequality and consumption inequality. The idea is that their findings can be expanded upon by looking at different household types. As stated by Deaton and Paxson (1994), empirical work on how inequality is distributed can help quantify the extent to which private and social arrangements. (i.e., access to credit markets, family labor supply, etc.) regulate how risk impacts the distribution of welfare. While measuring the contrast between consumption and earnings, the prediction is that the same gap can be observed when dividing households into married households and singles. However, due to the importance of family labor supply, the disconnect is expected to be more significant for married households, consistent with the findings presented in Blundell et al. (2016). Having access to two sources of labor income implies that you as a household are better equipped to smooth out your consumption across time.

In contrast, single households' consumption is much more susceptible to unexpected changes in labor income because their consumption is to a greater extent conditional on the individual's earnings. Thus, their consumption patterns should theoretically more closely track their current income. If this hypothesis were to be validated, it would also provide a valuable addition to the model presented in Storesletten et al. (2004), which focuses on the role of financial insurance in explaining inequality. As they admit in their paper, their model can not fully account for the gap between consumption and income inequality, thus leaving room for other potential explanatory factors. The proposition in this thesis is that family labor supply could be that additional factor.

3.2. Limits to Scope

This paper aims to examine whether the disconnect between consumption and earnings inequality holds for different household types and discuss whether family labor supply can explain these patterns, in line with Blundell et al. (2016). This research specification necessitates certain delimitations, partially for practical purposes but also to make the study more relevant.

The most significant delimitation has to do with the quantitative aspect of the second part of the aim. Although it will be possible to qualitatively reason about the role of internal insurance mechanisms based on the results from the empirical investigation, it is very difficult to quantify what proportion of consumption is secured via the labor market. Thus, it is beyond the scope of this paper to try and pin down the exact importance of each of the broad categories of mechanisms.

Instead, I aim to highlight whether there are other possible contributing factors than financial markets that contribute to these patterns. Naturally, if the variance between consumption and income inequality is not perfectly correlated, then other factors than family labor supply come into play, most notably the access to credit. However, if a covariance between the two variables can be observed, and if that pattern is more robust among singles, then it would be a strong indicator that family labor supply could impact consumption smoothing.

Another necessary delimitation that is explicitly not discussed in this paper is the role of financial aid in general and that related to child support in particular. Low et al. (2020) documented how the amount granted via food stamps differ between household types. Specifically, couples with one child received the highest monthly benefits, followed by singles with one child, couples without children, and finally singles without children. It could very well be the case that this unequal distribution of grants has a different impact on consumption and income for the two samples. This effect would fall under the category of external insurance mechanisms. I have not made any effort to correct this, possibly resulting in the empirical results showing a more significant disconnect than the case should this have been adjusted for.

Moreover, there is a potential problem with controlling for selection in the samples. The issue here is that people within the sample will naturally change marital status during the data collection period. One of the significant causes of marriage breakdown is financial troubles related to labor market status (Burgess et al., 2002). Thus, the earnings shock can presumably be driven by unemployment spells if you observe a drop in income following divorce. One possible solution for this would be to add 2-3 year lags to the earnings on consumption. Doing so would eliminate the effect on consumption and earnings driven by the particular interim spell between marital statuses, which does not capture the difference between household types per se.

Naturally, several more delimitations will be discussed throughout the paper. These are only the most central delimitations.

3.3. Academic Contribution

The main goal of this study is to provide new insights into the current research on economic inequality. This subject is one of the most important macroeconomic questions of our time. Although this field has been widely researched, a limited amount of work has been done to explain consumption inequality. Those who do tend to focus on external insurance mechanisms, emphasizing financial markets as the key contributor. It is very rare to view papers on the role of

labor markets in relation to inequality, despite indications that it does play a crucial part as a source of consumption insurance.

The ambition is that this study can change this in two distinct yet integrated ways: Partly by providing a more nuanced view of how the disconnect between consumption and income inequality looks in the data. But also by shedding light on the importance of family labor supply as an insurance mechanism for household consumption. To the best of my knowledge, no has been presented on the divergence between consumption and income inequality with a pronounced focus on different household types. Thus, making the findings from this paper unique in an empirical setting. Ultimately, this paper aims to offer valuable insights into the field of macroeconomic phenomena, household behavior and finances, and policy-relevant questions related to inequality.

3.4. Research Questions

Before moving on to the empirical parts of this paper, it is helpful to reiterate the research focus in somewhat more precise terms. The questions that this study aims to answer are the following:

I. *Does the disconnect between consumption and earnings inequality hold for different household types (single or married)?*
II. *If so, can family labor supply explain these patterns?*

4. Empirical Method

4.1. Data

4.1.1. The PSID Data

The empirical analysis in this paper uses the Panel Study of Income Dynamics (PSID) data between 2009 and 2019. The PSID data is the longest-running longitudinal household survey globally and is directed by faculty at the University of Michigan. Since 1968, the study has collected data on a nationally representative sample of over 18,000 individuals living in 5,000 families across the United States. Since 1997, information on these people and their respective descendants has been collected on a biannual basis. Variables included in the sample are (but are not limited to) data covering employment status, income, expenditures, and level of education. The information is readily available on their website and is frequently used by researchers, policy analysts, and teachers worldwide. Today, over 6,800 peer-review publications have been published based on the PISD data (PSDID, 2022). An advantage of the PSID relevant for this study is that it collects data

on different income and consumption expenditures measures, making the information more consistent and trustworthy. There are, of course, other reliable data sources containing information either on income (i.e., the Current Population Survey) or consumption (i.e., the Consumer Expenditure Survey). Although these sources are arguably more comprehensible within their respective parts, it becomes difficult to make comparisons with inconsistent measures. Hence, the consistency that the PISD provides across both critical variables triumphs over the accuracy and breadth that any of the two specific measures offer.

4.1.2. Limitations to Data

Despite the benefits of the PSID data, some drawbacks come with using such a survey. As for consumption, the coverage ratio (expressed as a proportion of total household expenditures) is approximately 70 percent. This is considered relatively high, although it implies that consumption variables that account for around 30 percent of a typical household's expenditures are not being accounted for. Most of the missing variables fall under the category of durable goods, which do not need to be purchased often and typically last for at least three years (Investopedia, 2021). For example, the data includes the nondurable expenses for transportation (i.e., gasoline) but not the car purchase itself. Households do not derive direct utility from expenditures on durable goods but rather from the flow of services they provide during their lifetime. Thus, the consumption of durable goods is more sensitive to the business cycle. Households could temporarily reduce their nondurable expenses when their incomes drop without causing any significant harm to their current utility.

Furthermore, certain durable goods can be used as collateral due to their longer life expectancy. This makes durable goods easier to finance using credit (Dossche and Saiz, 2018). These sensitivity effects are likely to be more present among single households due to their limitations on labor supply and credit markets discussed in previous sections. Thus, married households' expenses for durable goods are expected to be higher on average and more consistent over time. Hence, the proportion of total consumption consisting of nondurable goods is likely higher among married households, implying that parts of the possible disconnect are not found in the used data. Although it is only possible to theorize about its impact, it is an aspect worth recognizing.

Another disadvantage with the PISD data is that households fill in the survey themselves, carrying the risk of different forms of self-reporting biases. Self-reporting studies could result in over-/underreporting specific figures or mistaking the material covered in the survey. This issue has

partially been resolved by eliminating missing and extreme values, but little can be done to correct specific measurement errors. For example, people might report spending more money on childcare than they do to make themselves feel better. This type of validity problem is har do overcome in any kind of study but is especially prevalent in self-reporting surveys.

A third shortcoming with the survey is that labor earnings are expressed as a pre-tax variable in the PSID data. Since the pre-tax income is higher than the post-tax income, households' disposable labor earnings will consistently be lower than the values reported in the survey. This is not necessarily problematic since both samples (single and married households) are subject to this matter. The issue here is due to the U.S taxation system's progressive nature. Because the tax burden increases with higher labor incomes (Internal Revenue System, 2022), and individuals in married households generally have higher salaries, this sample's taxation effect is more significant. This implies that the divergence between consumption and income is smaller than what can be deduced from the data.

The limitations discussed in the section above do not constitute an extensive list. Still, they are instead selected because they are predicted to have the most profound impact on the empirical analysis.

4.2. Descriptive Statistics

To estimate the disconnect, I need to construct measures of household consumption and labor earnings. To do so, I have taken inspiration from the empirical work presented in the paper by Blundell et al., (2016). Parts of their data files have been replicated using the statistical software STATA.

Since most of the missing items fall under durable goods, focusing on nondurables and services is natural. Before 1999, the study collected data on very few consumption items, such as food and child care. However, starting in 1999, consumption expenditure data cover many other items of nondurables and services, including health expenditures, utilities, education, and transportation.

While rent is reported whenever a household rents a house or apartment, it is not reported for homeowners. To overcome this issue, I input the rent expenditures for homeowners using the self-reported house price. Consistent with the methodology used in the Blundell et al. (2016) study, yearly rent expenditure is set at 6 percent of reported home values. These consumption categories are then aggregated to get the cumulative consumption measure.

In addition to the consumption categories, data on wages and earnings for the first and second earners are also required. The PSID collects data on annual labor earnings and annual hours of work. It is worth noticing the female participation rate (around 80%) and that they earn about half of what males earn on average. This is partly due to lower work hours (conditional on working) and partly because of other factors. Descriptive statistics on the various consumption and labor income components for married couples and singles are reported in Table 1 and Table 2, respectively, below. Note that there are naturally no columns for single households for the second earner, as only one adult participates in the labor market within this sample.

For comparison, I refer to Table 1: Descriptive Statistics in Blundell et al. (2016) study. The reported numbers are, for natural reasons, not identical. This is mainly due to three reasons. The first is that I use different waves (2009-2019) than they do (1999-2009). The second reason is that while they keep all households in a single sample, I have divided the data into married couples and singles. The final reason is that I have used a different age span (25-65) than they did (30-65). You might also notice that the category of health insurance is not included despite being a part of the replicating study. This is due to an error in the data, in which all observations from 2013, 2015, and 2017 waves reported the same number (1350), excluding extreme values and missing values. Thus, I decided to exclude this category.

Table 1. **PSID Data from 2009-2019 waves (married households)***

	2008	**2010**	**2012**	**2014**	**2016**	**2018**
Consumption	60,562	64,762	65,325	66,564	70,585	76,791
Nondurable consumption	8,385	9,543	9,629	9,333	9,997	10,798
Food at home	5,880	6,179	6,336	6,689	7,568	8,187
Gasoline	2,504	3,363	3,293	2,644	2,429	2,611
Services	23,149	22,839	23,034	23,949	25,295	27,598
Food out	2,247	2,234	2,370	2,640	2,948	3,222
Health serv.	979	993	894	933	867	908
Utilities	2,705	2,739	2,565	2,632	2,641	2,795
Transportation	2,030	1,998	2,124	2,014	2,225	2,452
Education	2,186	2,131	2,193	2,082	1,795	1,822
Child care	619	657	682	700	873	983
Home ins.	516	580	569	593	619	662
Rent (or rent eq.)	11,866	11,506	11,636	12,355	13,328	14,753
First earner (head)						
Earnings	57,089	55,155	56,362	59,772	62,317	68,456
Hours worked	2,103	2,078	2,135	2,186	2,213	2,243
Second earner						
Participation rate	0,80	0,80	0,82	0,81	0,80	0,81
Earnings|work	23,773	22,941	23,693	25,648	26,496	30,132
Hours worked|work	1,168	1,131	1,127	1,164	1,190	1,247
Observations	20,476	19,370	18,597	17,143	17,682	16,177

**Consumption and earnings categories are expressed as average values for each year.*

Table 2. **PSID Data from 2009-2019 waves (single households)***

	2008	**2010**	**2012**	**2014**	**2016**	**2018**
Consumption	40,053	38,788	39,502	40,878	46,350	48,561
Nondurable consumption	5,644	5,945	5,991	5,675	6,599	7,128
Food at home	4,012	3,986	4,002	4,183	4,985	5,524
Gasoline	1,632	1,959	1,989	1,491	1,614	1,603
Services	14,383	13,449	13,761	14,764	16,577	17,153
Food out	2,221	1,972	1,973	2,153	2,493	2,702
Health serv.	529	449	533	557	576	514
Utilities	1,672	1,704	1,522	1,684	1,805	1,814
Transportation	1,432	1,388	1,489	1,439	1,604	1,793
Education	812	838	625	727	751	569
Child care	221	161	192	167	163	231
Home ins.	219	229	217	227	264	251
Rent (or rent eq.)	7,276	6,708	7,208	7,811	8,919	9,279
First earner (head)						
Earnings	42,273	38,422	38,752	43,285	44,226	47,572
Hours worked	2,019	1,914	1,919	1,993	2,108	2,122
Observations	2,657	2,696	2,747	2,537	2,421	2,153

**Consumption and earnings categories are expressed as average values for each year.*

4.3. Empirical Strategy

4.3.1. Creating Variables for Consumption and Earnings

The data has been cleaned from extreme and missing values as a general first step. This has been done by eliminating observations in which the reported number has not been filled in or is considered an outlier for that particular category. As mentioned earlier, the goal of this procedure is to minimize the impact of self-reporting biases.

For specific categories in the PSID, the data is not collected on an annual basis. For example, all medical care variables are reported for two years. Another example of a deviation from the annual-based reporting format is utilities, which are reported monthly or even weekly for some households. These variables have been adjusted by multiplying or dividing the numbers with the appropriate time unit to overcome this inconsistency in the data. By doing so, you ensure that all variables come with consistent time frames, that is, numbers corresponding to 12 months.

Once these adjustments have been made to the data, consumption categories have been created by adding together specific individual measures of expenditures. For example, the category labeled ‘health services’ consists of the sum of expenditures for the variables ‘nursing’, ‘doctor’s appointments’, and ‘medical prescriptions’. Finally, a variable named ‘total consumption’ is created by adding all the created consumption categories. This is the ultimate variable used as the measure of household consumption.

The statistics required for earnings are much easier to work with since the survey collects data on annual labor income and annual hours of work. This variable is simply the only adult's labor income for single households. For married couples, these numbers are reported for both the first and second earner, given that the spouse participates in the labor market. Total labor income for the married couples sample is then constructed as the sum of the household head’s labor earnings plus the spouse’s labor earnings, conditional on labor market participation. Naturally, missing values and extreme values for earnings have been cleaned from the data, similarly to the consumption variables.

4.3.2. Estimating the Disconnect

The empirical analysis focuses on households with participating male household heads between the age of 25 and 65. Age selection is motivated by the fact that labor market participation is the highest within this interval (U.S Bureau of Labor Statistics, 2022). Since this study captures the importance of family labor supply, focusing on those groups of people whose highest participation rates make conditions suited for a more rigorous analysis.

The data is then divided into two samples; married couples and singles. To be included in the first sample, the requirement is such that the household must have been married for at least one year when the data was collected. This is partly due to the nature of marriage itself, as it takes time for households to settle in on a new reality and adjust their economic behaviors accordingly. A factor more ad hoc to this study is that compensation through additional labor is more likely to take place once a couple has already entered the marriage. Thus, it makes sense to include only these households in the first group. Besides the difference in household type, no other changes have been made to the two samples. This is intentional because the aim is to estimate the disconnect between consumption and income inequality for the two samples, all else being equal.

It is essential to notice that the second sample also drops female household heads. This is done deliberately to avoid any systematic errors related to sex. It is reasonable to assume that differences in consumption measures and income persist between the two genders. By focusing only on male households in both samples, the objective is to make sure that the comparison between the two samples is unbiased from these plausible gender differences. The selection of men rather than women is motivated by the simple fact that the participation rate is higher among the former group.

The logarithm of the variance for the two economic measures, labor earnings and consumption is then regressed on the sample's age. Looking at these figures at different ages rather than years makes it possible to follow the same people across time, which is essential since, as mentioned earlier, inequality increases over the life cycle.

The reason variance is used rather than some other econometric measure is that it makes it possible to identify the effectiveness of the insurance mechanisms. The idea is that if family labor supply does play a role in consumption smoothing, the variance in consumption and earnings will be more dispersed for married households. For single households that do not have access to this insurance mechanism, the variance in consumption and earnings is expected to be more similar. Because the only systematic difference between the two samples is their respective marital statuses, family labor supply is presumably the explanatory factor, should there be a difference between the two samples.

Using the logarithmic function rather than the nominal form for the variables is beneficial for several reasons. One of them is that it makes the findings less sensitive to outliers. Although the data set has been cleaned of extreme values, there are no guarantees that this process has eliminated anomalous characteristics due to the limitations of the human factor. Taking the natural logarithm of the variables helps correct these issues by taking away extreme values. This type of value function also benefits from an interpretational point of view since the slope of the lines tells the percentage

point change across ages. The graph shows that one can quickly determine which ages, consumption, and income inequality change the most for the respective samples. Finally, using this methodology makes the findings in this study more comparable to other papers. Storesletten et al. (2004) and Kruger and Perri (2005) are among the similar studies that both present their findings in this way.

5. Empirical Results

By following the methodology presented in Section 4.3. the main findings are now ready to be delivered. This section begins with a graphical display of the two samples paired with a general description of the main conclusions drawn from the empirical results. A comparison between the two samples then follows this part.

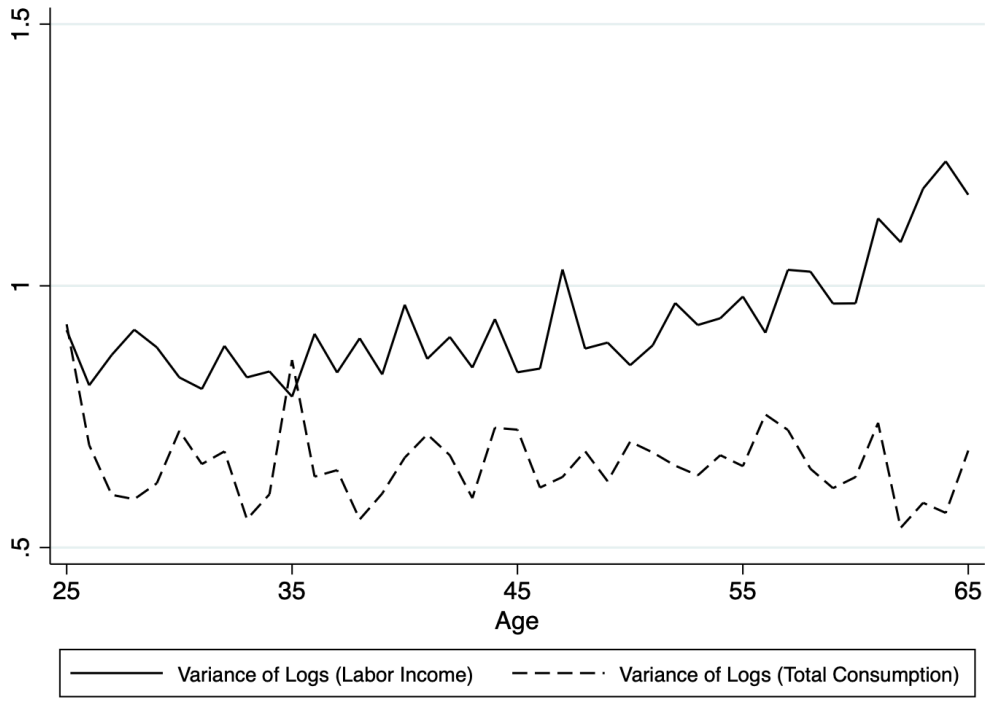
5.1. Graphical Presentation

The results from regressing the logarithm of the variance in consumption and labor earnings on age are shown below in Figures 1 and 2. The graphical results are divided into the study's two samples: married households and single households.

5.1.1. Married Households

Figure 1 displays the estimated variance in consumption and earnings across ages for married households. Recall that for this sample, variables are expressed for the entire household. Thus, the earnings line corresponds to labor incomes for the household head and partner combined. The consumption line also consists of expenditures for both adults in the household. For this study, two main conclusions can be derived from this graph: the gap and correlation between the two variables. The variance in labor incomes is higher than consumption during the entire time series. Moreover, the two variables take on different development trajectories, especially towards the end of the studied age interval. No consistent changes in the pattern can be observed for the variance in consumption, whereas the variance in labor earnings increases as households age.
Similarly, the two variables also tend to move more or less independently, implying a low correlation between them. In other words, an unexpected change in earnings seems to have little effect on these households' consumption in the following years.

Figure 1. **Line Graph of Variance in Consumption and Labor Income: Married Households**

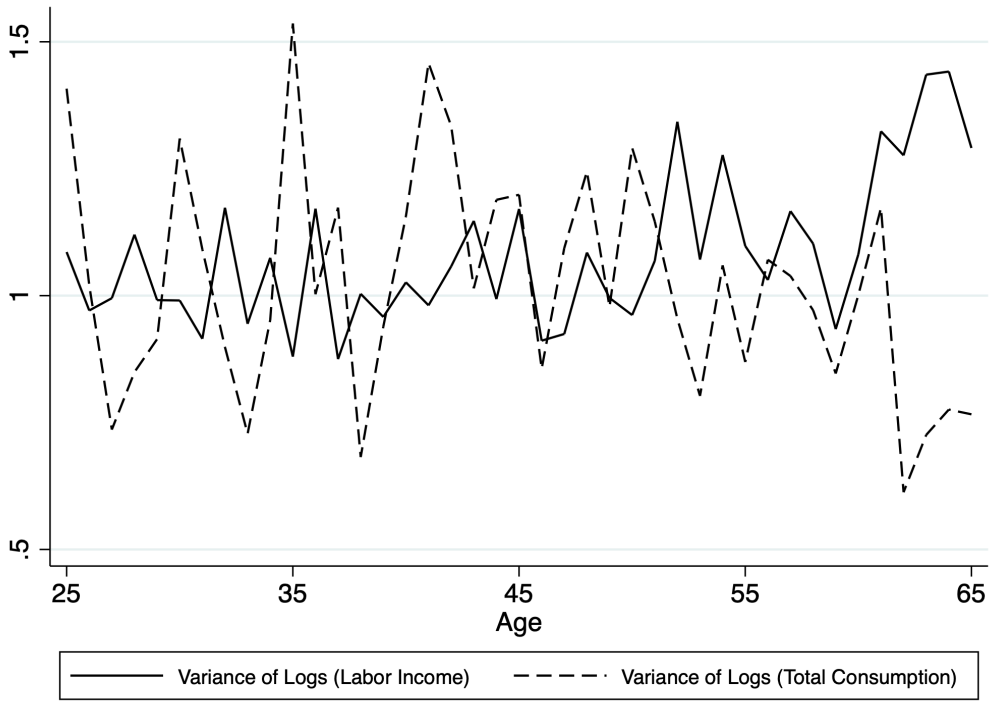


Source: Panel Study of Income Dynamics between 2009 and 2019.

5.1.2. Single Households

Figure 2 displays the estimated variance in consumption and earnings across ages for single households. Also, from this graph, two main conclusions can be obtained related to the gap and correlation between the variables. As you can see, there is no consistency in the divergence between consumption and earnings. Instead, the two variables seem to alternate which of them demonstrates the highest variance, with no particular continuity in explaining these patterns during the studied age interval. Second, the covariance between consumption and earnings is strong, in the sense that when one variable moves up or down, the other variable tends to follow, although with some delay. Even though it is not possible to tell for sure simply by looking at this graph, you can intuitively assume that fluctuating incomes cause changes in consumption, not the other way around. An unexpected shift in labor incomes seems to impact consumption in the following periods for these households dramatically.

Figure 2. **Line Graph of Variance in Consumption and Labor Income: Single Households**



Source: Panel Study of Income Dynamics between 2009 and 2019.

5.2. Sample Comparison

Comparing the findings of the two samples is a fruitful exercise since it allows for a more nuanced view of the empirical results, particularly in relation to the formulated research questions. In this section, the focus is more on emphasizing the contrasts between the two samples and laying the foundation for the implications of this thesis. At the same time, less attention is devoted to the individual graphs per se.

Starting with consumption, the measure fluctuates quite dramatically for single households during the entire time series, whereas it changes very little for married households. Labor incomes fluctuate within both samples but significantly more for singles. Also, while the variance in earnings tends to grow for married households as they age, it stays more or less the same over time for single households, except for an increase in the final years of the studied time interval. Furthermore, the variance between consumption and income is consistently more considerable for married households. This gap magnifies as these households age, while there is no clear pattern to observe in the case of single households. Finally, the correlation between labor income and consumption is

high for singles, whereas it is more or less zero for married households. These observations lay the foundation for the conclusions drawn from this study.

Two things are puzzling with the empirical results. The first concern is that the variance of log earnings is not rising for singles. The second issue is that the initial values of the variance of log earnings for couples are a bit too large compared to similar studies. Both of these puzzles are likely driven by selection problems. In a representative sample, you would expect the earnings variance to increase over time since individuals' salaries take on different trajectories that develop in a non-linear fashion. On a similar note, you would expect a lower initial variance in earnings in the entire population than in this data set since earnings do not differ that much among young adults.

6. Discussion

6.1 The Role of Marital Status for Consumption Inequality

The empirical evidence suggests that the disconnect holds for married households, consistent with the findings in Krueger and Perri (2005). The variance in labor incomes is consistently more significant than the variance in consumption, a gap that also magnifies as households grow older. This type of household seems to behave in a manner consistent with the permanent income hypothesis, adjusting their consumption over time based on their expected lifetime incomes rather than their current earnings. However, the same disconnect does not appear in the data when looking at single households. The consumption and labor income variance follows a similar pattern in this sample and does not display any consistent gap over time.

A lower correlation in the variance between consumption and income inequality implies more efficient consumption smoothing and, thus, more resilience against income variations. If a group of households can maintain the same expenditures despite a temporary loss in earnings, they are not particularly susceptible to income shocks. In contrast, if the variance in consumption and earnings is strongly correlated for a group of households, they are not as efficient at smoothing consumption over time and, thus, are more sensitive to income fluctuations. Based on the empirical work presented in this study, one can conclude that married households are not particularly affected by temporary fluctuations in labor incomes, in contrast to single households whose consumption patterns are strongly impacted by their current income levels.

Being able to smooth out consumption over time is an essential tool for decreasing consumption inequality across ages. If households base their behaviors on their expected lifetime income rather than their current income, household consumption will stay more or less flat over

time, despite fluctuations in earnings. On the other hand, if households are restricted from doing so, consumption will be dependent on current earnings to a more significant extent, earnings that change across ages. To maintain stable consumption patterns, households need to utilize insurance mechanisms, namely financial markets and labor markets. The evidence presented in this study suggests that married households experience lower levels of consumption inequality across ages than single households, which shows a higher variance in consumption. This disparity indicates that the two household types are not equally efficient at smoothing out their consumption across ages. Instead, being married appears to be an efficient prerequisite for stabilizing consumption across ages.

6.2 Family Labor Supply as a Source of Consumption Insurance

The second question is whether family labor supply can explain the divergence in consumption inequality between the two samples. Based on this study's empirical work, it is impossible to draw any measurable conclusions on this matter, nor was it the aim to do so. This should come as no surprise since it is very difficult and beyond the scope of this paper to quantify the extent to which different household types utilize specific insurance mechanisms to stabilize consumption. However, what can be done is to carry qualitative reasoning on the role of family labor supply as a source of consumption insurance. Consistent with the suggestions presented in Deaton and Paxton (1994), evidence of the spread of inequality can be used to help determine the extent to which private and social arrangements moderate the impact of risk on the distribution of welfare. In the case of this thesis, the empirical study on consumption inequality can thus serve as a tool used to help resolve which broad categories of insurance mechanisms household types use to stabilize consumption.

As emphasized earlier in this paper, much of the consumption inequality research focuses on so-called external insurance mechanisms (i.e., financial markets). However, more recent work by Blundell et al. (2016) suggests that households are not as dependent on external mechanisms as previously believed. Instead, they assert insurance mechanisms within the household's boundaries (i.e., labor markets). Despite the quantitative limitations, I would argue that the results presented in this paper provide a valuable addition to these latter findings.

The extent to which households can smooth out consumption and, on the contrary, how sensitive they are to changes in their current incomes is dependent on the availability and effectiveness of using these insurance mechanisms. Based on this logic and the empirical results of this study, married households utilize the available insurance mechanisms freely, taking advantage of both financial and labor markets. In contrast, single households' ability to smooth out

consumption seems limited in some ways, consistent with the hypothesis formulated in the research specification. In theory, this could be due to restricted access to financial markets, a lack of availability in family labor supply, or both. However, the only systematic difference constructed between the two samples is their respective marital statuses. Thus, there is a solid argument that the latter insurance channel plays a significant role in explaining these patterns, aligned with the findings presented in Blundell et al. (2016).

The tools households use to secure stable consumption can be regarded as a secondary concern, at least in theory. Naturally, different indirect costs are associated with these broad categories of insurance mechanisms. Taking on loans comes with intermediation costs which could impact one's creditworthiness. Providing additional labor supply carries alternative costs such as leisure time and energy, and so on. These costs should not be disregarded, but as long as households can finance their consumption, how they do so is relatively inferior. If they believe that the alternative cost of financing their consumption is too high, they can simply choose to remove some of them by lowering their expenditures.

A more fundamental concern arises when households' opportunities to secure stable consumption are hindered somehow, in which their behavior will be pushed away from the notion of a perfect capital market structure. In this sense, there is an inverse relationship between the two insurance categories. The more limited a household's access is to one channel, the more dependent it will be on the other. Following this reasoning, family labor supply is essential for financially restricted households, who cannot fully insure their consumption through borrowing and lending.

Similarly, the findings presented in this study highlight the practical limitations of financial markets as an insurance mechanism. If working perfectly, households would not need to use additional labor supply. However, the big difference in the disconnect between the variance of consumption and earnings tells a different story. These findings are consistent with the model presented by Storesletten et al. (2004), suggesting that labor market risks are imperfectly insured via credit, implying a missing link in U.S. households' consumption behavior. Ultimately, the results presented in this study suggest that family labor supply is the missing link and acts as an essential source of consumption insurance.

7. Conclusion

This study has aimed to empirically test if the disconnect between consumption and income inequality holds for different household types and, if so, discuss whether family labor supply can

explain these patterns. Using the PSID data set, I obtained two samples, one for married couples and one for singles, and investigated how these variables evolve across the ages of 25-65.

The main results can be summarized as follows. Estimating the variance of logs for the two variables, I find a substantial disconnect between consumption and income inequality for married couples, and this gap becomes larger as households grow older. However, the same disconnect does not appear when looking at single households, in which the gap is more or less non-existent.

Although difficult to quantify, I argue that family labor supply plays a vital role in explaining these patterns. Consistent with Blundell et al. (2016), this study nuance the view that financial markets are the only dominant mechanism households use to smooth consumption over time. Instead, it seems as though households also use tools within the household's boundaries in periods of lower incomes.

Based on this study, inequality differs among U.S households depending on marital status. The extent to which family labor supply can account for these differences is not apparent and beyond the scope of this study. Therefore, future research is needed to quantify to which degree internal insurance mechanisms account for these patterns and pin down the interplay between financial markets and labor markets for consumption smoothing across ages.

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