

February 2016

# Paychecks, Paydays, and the Online Platform Economy

## Big Data on Income Volatility



# About the Institute

The global economy has never been more complex, more interconnected, or faster moving. Yet economists, businesses, nonprofit leaders, and policymakers have lacked access to real-time data and the analytic tools to provide a comprehensive perspective. The results—made painfully clear by the Global Financial Crisis and its aftermath—have been unrealized potential, inequitable growth, and preventable market failures.

The JPMorgan Chase Institute is harnessing the scale and scope of one of the world's leading firms to explain the global economy as it truly exists. Its mission is to help decision-makers—policymakers, businesses, and nonprofit leaders—appreciate the scale, granularity, diversity, and interconnectedness of the global economic system and use better facts, real-time data, and thoughtful analysis to make smarter decisions to advance global prosperity. Drawing on JPMorgan Chase's unique proprietary data, expertise, and market access, the Institute develops analyses and insights on the inner workings of the global economy, frames critical problems, and convenes stakeholders and leading thinkers.

The JPMorgan Chase Institute is a global think tank dedicated to delivering data-rich analyses and expert insights for the public good.

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# Executive Summary

Americans experience tremendous income volatility, and that volatility is on the rise. Income volatility matters because it is hard to manage. The typical household faces a shortfall in the financial buffer necessary to weather this volatility. Moreover, the decline in real wages since 2009 for all income groups except the top 5th percentile means that life is harder to afford in general, but even more so when earnings dip below average. Rapidly growing online platforms, such as Uber and Airbnb, have created a new marketplace for work by unbundling a job into discrete tasks and directly connecting individual sellers with consumers. These flexible, highly accessible opportunities to work have the potential to help people buffer against income and expense shocks. The “Online Platform Economy” offers fewer worker protections than traditional work arrangements, however, which has led some to claim that the Online Platform Economy represents a fundamental shift in the nature of work.

This report from the JPMorgan Chase Institute digs deeper into the demographics and sources of income volatility and provides an unprecedented look at the impact of the Online Platform Economy. This analysis relies on high-frequency data from a randomized, anonymized sample of 1 million Chase customers between October 2012 and September 2015. To examine the Online Platform Economy, we assembled the largest sample of platform workers to date—a dataset of over 260,000 individuals who have offered goods or services on one of 30 distinct platforms.

## Data

### Constructing our samples:

#### From a Universe of 28 Million People



A checking account in every month between October 2012 and September 2015

At least five outflows in every month between October 2012 and September 2015



6 Million People

Random Sample

Income received at least once over the 36 months from one of 30 distinct platforms

1 Million People

260,000 People  
Online Platform Economy Participants

### Identifying income and jobs:

#### 1.9 Billion Inflow Transactions

Amount, date and time, transaction description, and channel

Categorize income components

#### Income Categories



**Labor income**  
Payroll, other direct deposits



**Capital income**  
Annuities, dividends, interest income



**Government income**  
Tax refunds, unemployment, Social Security



**Other**  
ATM deposits, unclassified income

Identify jobs

#### Jobs

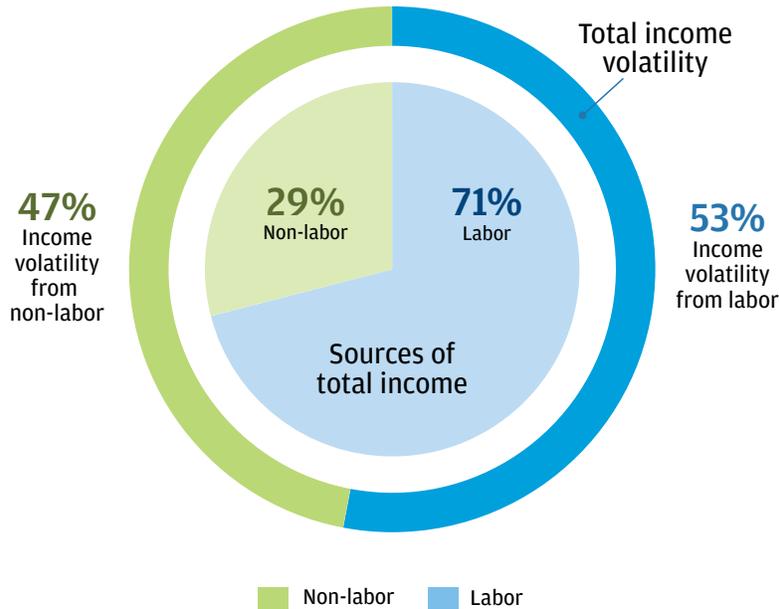
##### Job Transitions

##### Job Pay Attributes

Paycheck amounts  
Pay frequency

## Part I: Income Volatility Among U.S. Individuals

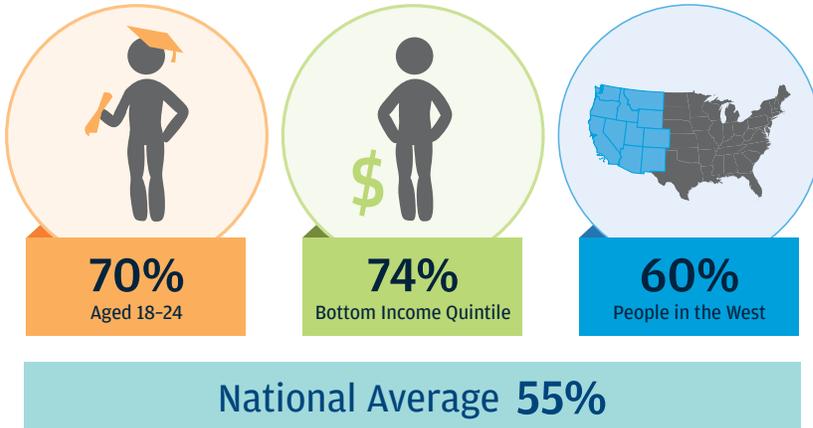
Part I of this report describes the key sources of income volatility among U.S. individuals. Labor income, or earnings, was the largest component of total income, representing 71 percent of total income and 53 percent of the sum total of the absolute percent changes contributing to volatility across all income categories.



### Finding One

Income volatility, prevalent across the board, was most marked among the young, those in the bottom income quintile, and those living in the West.

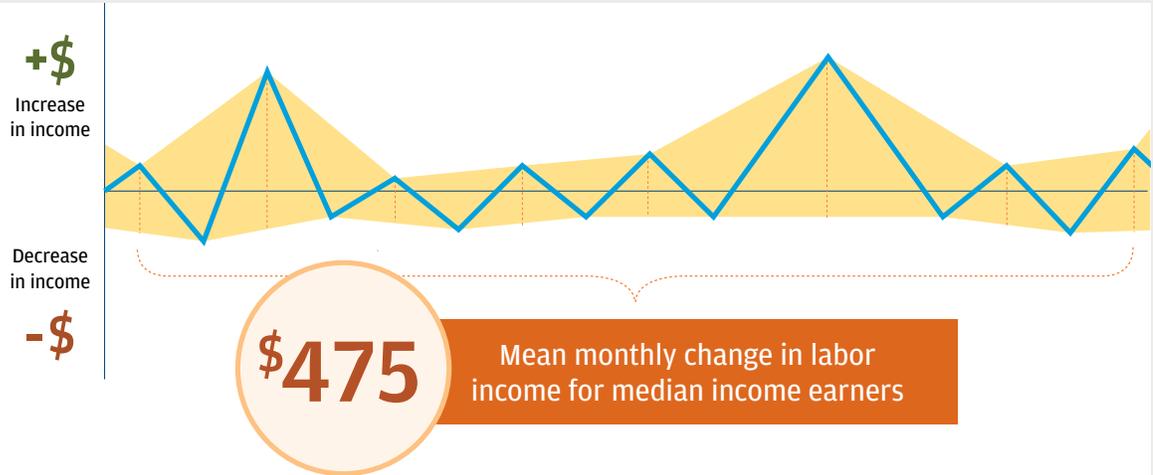
The percentage of people who experienced more than a 30 percent month-to-month change in total income



The vast majority of people aged 18-24, people in the bottom income quintile, and people living in the West experienced on average more than a 30 percent month-to-month change in total income.

**Finding Two**

Median income individuals experienced nearly \$500 in labor income fluctuations across months, with spikes in earnings larger but less frequent than dips.



The typical person experienced dips in income 43 percent of the time and spikes in income 33 percent of the time, and spikes were 67 percent larger in magnitude than dips.

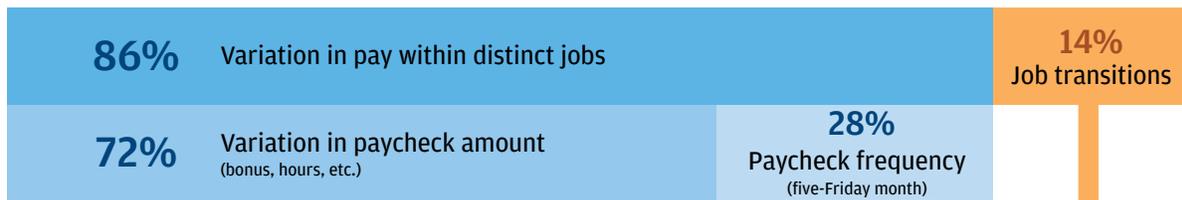
**Finding Three**

Most of the month-to-month volatility in take-home pay (86 percent) came from variation in pay within distinct jobs.

**Finding Four**

Almost four in 10 individuals experienced a job transition in a given year, contributing 14 percent of the month-to-month volatility in labor income.

Sources of Monthly Changes in Labor Income



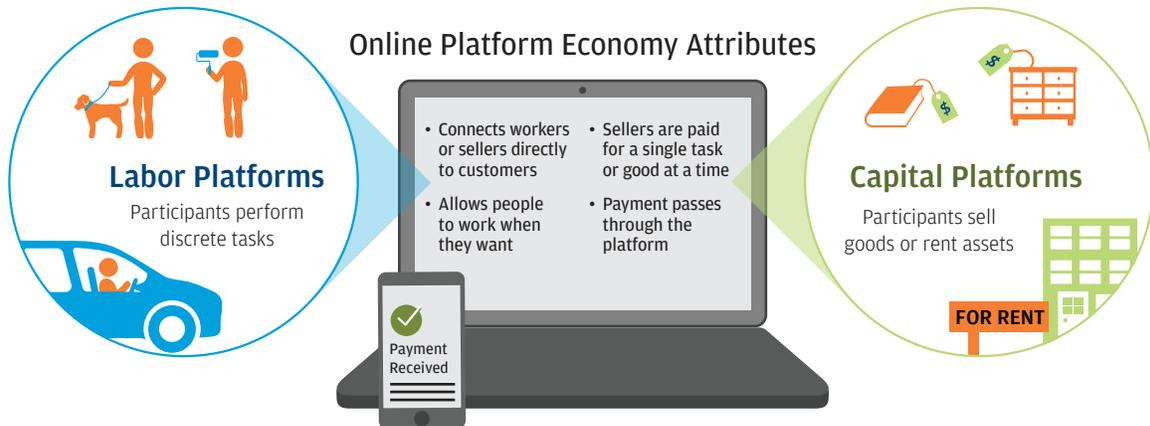
Median individuals experienced a \$1,108 change in monthly income when they gained or lost a job and \$830 when they switched jobs.



Almost four in 10 individuals experienced a job transition over the course of a year.

## Part II: The Online Platform Economy

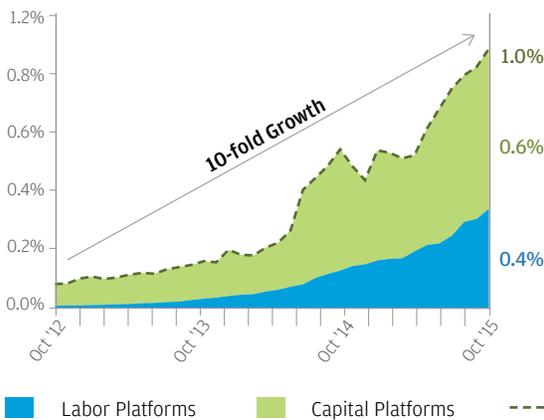
As a fast-growing and highly accessible new marketplace for work, many have characterized the Online Platform Economy as the “future of work.” We define the Online Platform Economy as economic activities involving an online intermediary that provides a platform by which independent workers or sellers can sell a discrete service or good to customers. Labor platforms, such as Uber or TaskRabbit, connect customers with freelance or contingent workers who perform discrete projects or assignments. Capital platforms, such as eBay or Airbnb, connect customers with individuals who rent assets or sell goods peer-to-peer.



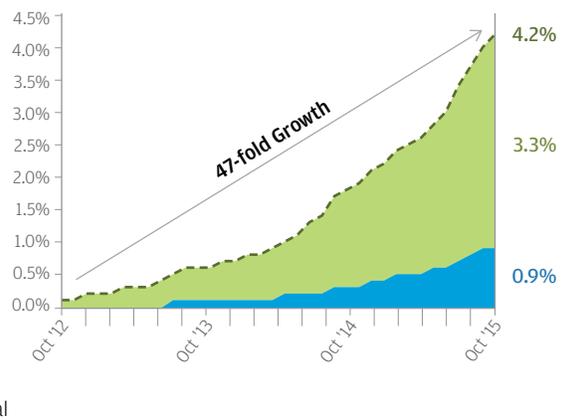
### Finding Five

Although 1 percent of adults earned income from the Online Platform Economy in a given month, more than 4 percent participated over the three-year period.

Percentage of adults participating in the Online Platform Economy in each month



Cumulative percentage of adults who have ever participated in the Online Platform Economy



Although labor platforms grew more rapidly than capital platforms, over 60 percent more people participated in capital platforms than labor platforms every month.

## Finding Six

The Online Platform Economy was a secondary source of income, and participants did not increase their reliance on platform earnings over time.



Labor platform participants were active **56%** of the time. While active, platform earnings equated to **33%** of total income.

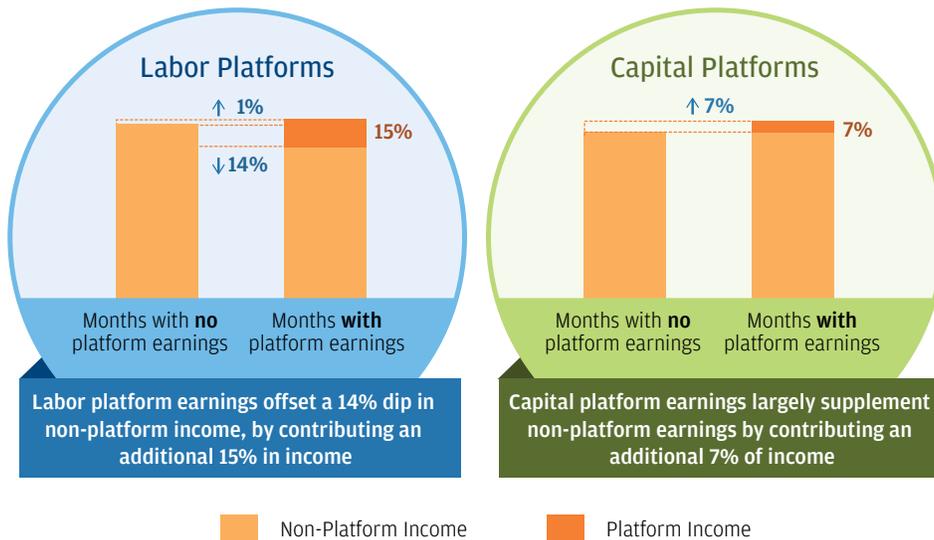
Capital platform participants were active **32%** of the time. While active, platform earnings equated to **20%** of total income.



Although the sheer number of people participating increased rapidly, reliance on platforms remained stable over time in terms of both the fraction of months that participants were active and the fraction of total income earned on platforms in active months.

## Finding Seven

Earnings from labor platforms offset dips in non-platform income, but earnings from capital platforms supplemented non-platform income.



Individuals relied on labor platform work not only when outside income dipped but also when they were between jobs. Labor platform participants were less likely to be employed in a traditional job in months when they were generating platform earnings (69 percent employed) compared to months when they were not (62 percent employed).

## Conclusion

The findings in this report underscore the importance of asset building so that families have enough liquidity to weather volatility in income and spending. Key, predictable savings opportunities include December to March pay spikes, five-Friday months for individuals with jobs that pay every two weeks or weekly, and tax season for those who receive tax refunds. The five-Friday effect also reveals a structural disconnect between typical employer pay cycles and billing cycles. Eighty percent of individuals received an extra paycheck in five-Friday months because they held a job that paid every two weeks or weekly. Meanwhile, 40 percent of expenditures, including rent payments and installment loans, have a fixed per-month expense regardless of the number of days in that month. These fixed costs are potentially easier to cover during, or shortly after, months with an extra paycheck. Employers, financial institutions, utilities, and landlords can ameliorate this mismatch by offering paycheck cycles that sync with payment cycles or vice versa.

This study is the first of its kind to shed light on the Online Platform Economy using financial transactions, and provides an important foundation for the many policy and economic debates related to what some have termed the “future of work.” Over the three years of our study (October 2012 to September 2015), 4.2 percent of adults, an estimated 10.3 million people—more than the total population of New York City—earned income on the platform economy. This number increased 47-fold over the three years. We distinguish between labor platforms and capital platforms and find that, although labor platforms grew more rapidly than capital platforms, participation on capital platforms was more than 60 percent higher than participation on labor platforms. Although the sheer number of people participating grew rapidly, platform earnings remained a secondary source of income, and reliance on platform earnings did not increase for individuals over time.

The Online Platform Economy adds an important new element to existing labor markets, however. Simply put, landing a platform job is easier and quicker. Individuals can, and do, generate additional income on labor platforms in a timely fashion when they experience a dip in regular earnings. This is a potentially far better option to mitigate or weather volatility, if the alternatives are to constrain spending or take on additional credit. Moreover, this option meets a target need. Participation in labor platforms is highest precisely among those who experience the highest levels of income volatility—the young, the poor, and individuals living in the West.

# Introduction

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Americans experience tremendous income volatility, and that volatility is on the rise.<sup>1</sup> Income volatility matters because it is hard to manage. In our report *Weathering Volatility*, we documented that 41 percent of individuals experience more than a 30 percent change in income on a month-to-month basis (Farrell and Greig, 2015). These high levels of income volatility exist across the income spectrum, and the typical household faces a shortfall in the financial buffer necessary to weather this volatility. Now more than ever, income volatility is an important economic phenomenon affecting the welfare of the typical American. The decline in real wages since 2009 for all income groups except the top five percent means that life is harder to afford in general, but even more so when earnings dip below average (Gould, 2015). Moreover, with labor force participation at a historic low, particularly among the young, people may not have an employed family member to help buffer those dips in income (Council of Economic Advisors, 2014).

The growth of the “Online Platform Economy” adds a new twist to this picture. Rapidly growing online platforms, such as Uber, Airbnb, and eBay, have created a new marketplace for work by unbundling a job into discrete tasks and directly connecting individual sellers with consumers. These flexible, highly accessible opportunities to work generate earnings that are volatile by choice. But they have the potential to help people buffer against income and expense shocks (Hall and Krueger, 2015). The flexibility offered by the platform economy also suits the youngest cohort of workers, who prioritize autonomy and work-life balance more than previous generations (Myers and Sadaghiani, 2010; Fromm, 2015).

As a primary source of income, however, the platform economy offers fewer worker protections than traditional work arrangements. The absence of benefits—such as employer contributions to Social Security, insurance, and other retirement accounts—have led some to claim that the platform economy represents a fundamental shift in the nature of work, and to propose the creation of a new class of “independent worker” (Harris and Krueger, 2015). These debates raise many questions, including: Who is participating in the platform economy? How much income are they earning through the platform economy? How dependent are they on this income? Has this new source of income increased or decreased income volatility?

This report from the JPMorgan Chase Institute digs deeper into the demographics and sources of income volatility and provides an unprecedented look at the impact of the platform economy. This analysis relies on high-frequency data from a random, anonymized sample of 1 million Chase customers between October 2012 and

September 2015. Paired with individual attributes like age, income, and geography, this data sample allows us to drill down to jobs and individual paychecks to provide a deeper understanding of the roots of income volatility. While aggregate sources of income data typically adjust for seasonal and calendar effects, we focus on take-home pay, which gives us an important window into the cash flow realities of many Americans. To examine the platform economy, we assembled the largest sample of platform workers to date—a dataset of over 260,000 individuals who have offered goods or services on one of 30 distinct platforms. We distinguish between labor platforms, where people perform discrete tasks, and capital platforms, where people sell goods or rent assets. This report provides a unique composite view into the financial lives of participants in these platforms.

Part I of this report describes the key sources of income volatility among U.S. individuals. Part II examines the size and growth of the platform economy and earnings among those who participate in it, and explores whether participants in the platform economy are able to mitigate income volatility through their platform earnings.

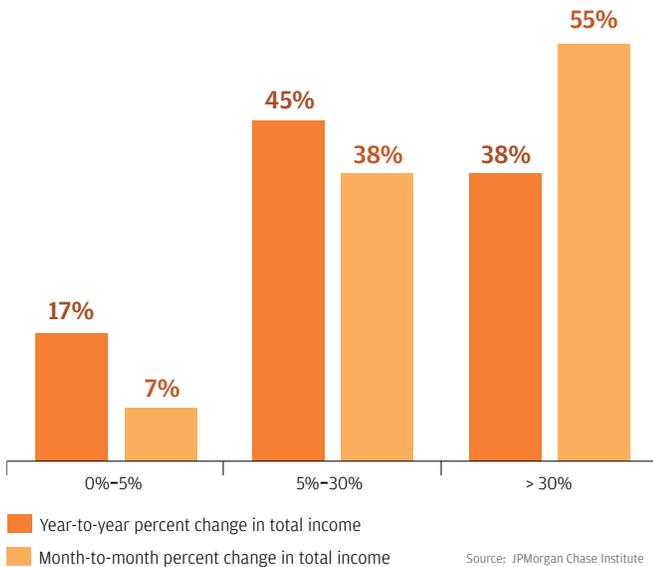
Our findings in Part I are fourfold. First, while income volatility was prevalent across the board, it was most marked among the young, those in the bottom income quintile, and those living in the West. Second, median income individuals experienced nearly \$500 in labor income fluctuations across months, with spikes in earnings larger but less frequent than dips. Third, most of the month-to-month volatility in take-home pay (86 percent) came from individuals staying in the same jobs. Finally, four in 10 individuals experienced a job transition in a given year, contributing 14 percent of the month-to-month volatility in labor income.

Part II reveals three key findings. First, although only 1 percent of adults earned income from the Online Platform Economy in a given month, more than 4 percent participated from October 2012 to September 2015. We distinguish between labor platforms and capital platforms and find that, although labor platforms grew more rapidly than capital platforms, participation on capital platforms was more than 60 percent higher than participation on labor platforms in every month. Second, the platform economy was a secondary source of income for most people, and reliance on platform earnings did not increase for individuals over time. Third, earnings from labor platforms offset dips in non-platform income, but earnings from capital platforms supplemented non-platform income. We describe each of these findings in detail below.

# Part I: Income Volatility Among U.S. Individuals

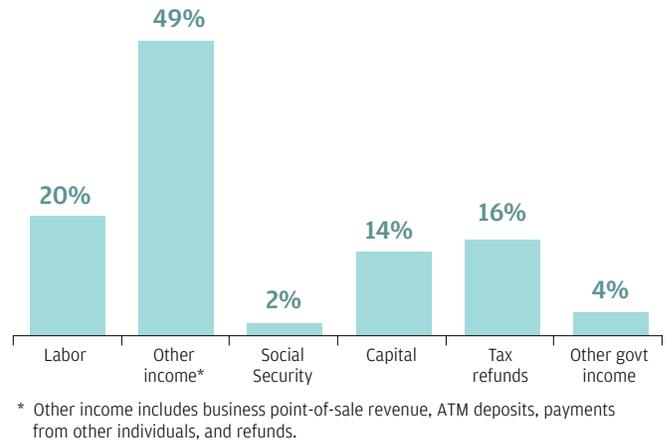
To study income volatility, the JPMorgan Chase Institute created an anonymized dataset of the financial transactions of over 6 million customers over three full years, October 2012 to September 2015. Using a random sample of 1 million primary account holders (for the purpose of this report, “individual(s)” refers to those account holders), we categorized inflow transactions into income categories versus transfers from other accounts.<sup>2</sup> In this sample, individuals experienced significantly more volatility on a month-to-month basis than on a year-to-year basis (Figure 1). On average, individuals experienced a 40 percent change in total income on a month-to-month basis.<sup>3</sup> Only 7 percent experienced less than a 5 percent change in income from month to month, while 55 percent experienced changes in total income of more than 30 percent.

**Figure 1: Distribution of absolute percent change in total income**



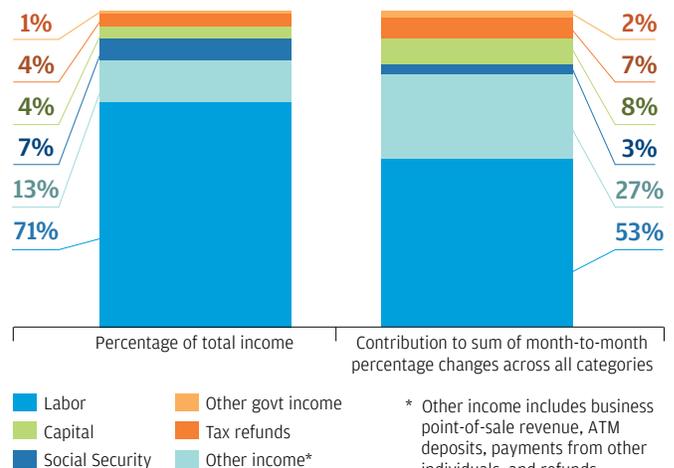
Other income, which includes business revenue, ATM deposits, and transfers from other individuals, among other sources, was the most volatile component of income, fluctuating by 49 percent on a monthly basis. Labor income (20 percent variation), tax refunds (16 percent variation), and capital income (14 percent variation) were the next most volatile components of income. Government transfers—Social Security and other social assistance programs—were the steadiest sources of income.

**Figure 2: Absolute month-to-month percent change, by income component**



Labor income, or earnings, was the largest component of total income, representing 71 percent of total income (Figure 3), and 53 percent of the sum total of the absolute percent changes contributing to volatility across all income categories. Other income represented 13 percent of total income but contributed 27 percent of the sum of the absolute volatility across categories. The remaining categories comprised 16 percent of income and accounted for 20 percent of total income volatility.

**Figure 3: Sources of income and total income volatility**



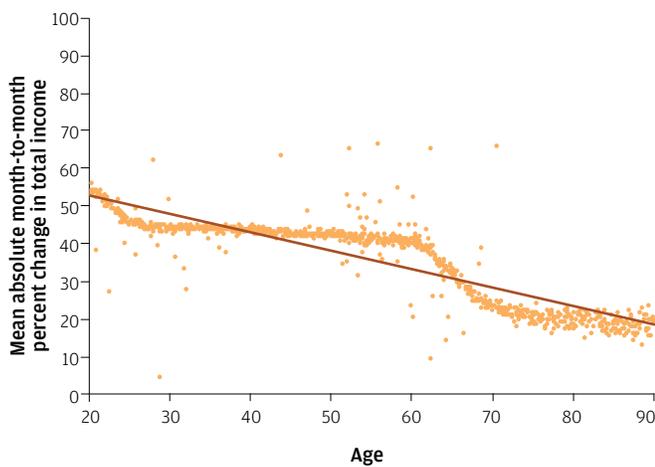
# Finding One

Income volatility, prevalent across the board, was most marked among the young, those in the bottom income quintile, and those living in the West.

## Age differences in total income volatility<sup>4</sup>

Young people experienced more income volatility than older people. Figure 4 plots month-to-month percent change in total income by age. Notable from this figure are the significantly higher levels of income volatility among individuals under 30, and the significantly lower levels of income volatility among individuals over 60. Income volatility was relatively stable between 30 and 60. The percentage of people who experienced more than a 30 percent change in total income on a month-to-month basis was 70 percent among those 18 to 24, and 61 percent for those 25 to 34, compared to an average of 55 percent for the whole population. Higher income volatility among young adults was consistent with existing literature and may have been due to a less stable attachment to the labor force, more hourly rather than salaried work, and more frequent job transitions.<sup>5</sup> Lower income volatility among older adults was partly due to the composition of income by age (See Figure 32, page 32). Predictably, individuals over 65 relied significantly on more stable components of income, including Social Security and capital income.

Figure 4: Month-to-month percent change in total income, by age

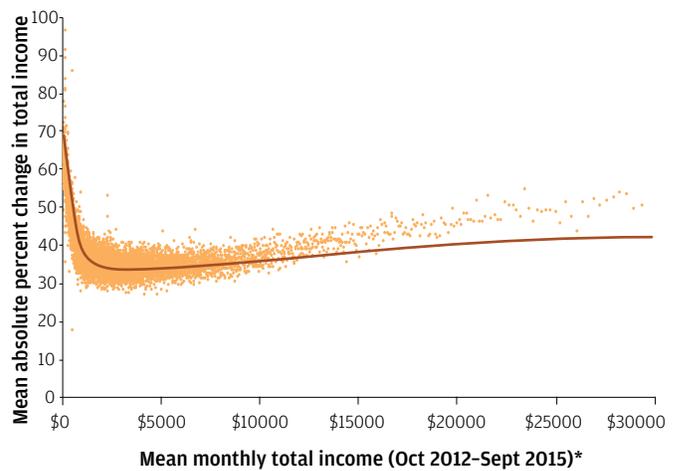


Source: JPMorgan Chase Institute

## Income level differences in total income volatility

Examining income volatility by income level, we find that the lowest-paid individuals saw the most volatility in their income, after which volatility rates tended to moderate (Figure 5). Among individuals with more than roughly \$3,500 in monthly take-home pay, income volatility tended to increase.<sup>6</sup> The percentage of people who experienced more than a 30 percent change in total income on a month-to-month basis was 74 percent among individuals in the bottom quintile of earners, compared to a national mean of 55 percent, and 54 percent among top quintile earners. This is due, in part, to the composition of income. Lower-income individuals rely on more volatile sources of income, such as tax refunds, which are received in a lump sum once a year, as well as other sporadic sources of income.<sup>7</sup>

Figure 5: Month-to-month percent change in total income, by mean monthly total income



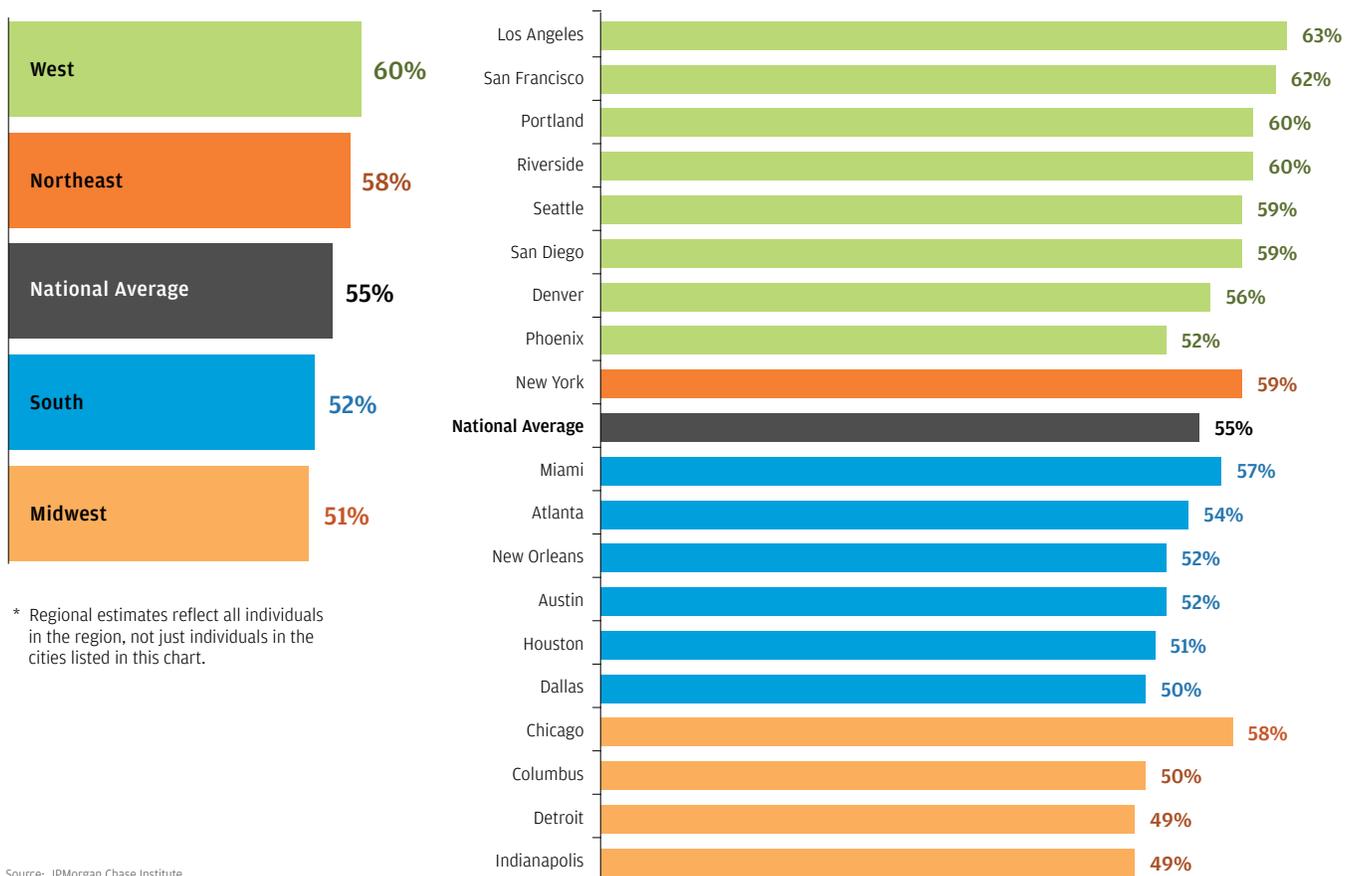
\* Monthly income has been truncated at \$500 per month, because estimates below this level are unreliable.

Source: JPMorgan Chase Institute

## Geographic differences in total income volatility

In addition, we find significant geographic differences in income volatility: Individuals in the West experienced significantly more income volatility. Figure 6 displays the percentage of individuals who, on average, experienced more than a 30 percent change in total income on a month-to-month basis. Sixty percent of individuals in the West and 58 percent in the Northeast experienced income changes greater than 30 percent on a month-to-month basis, compared to 52 percent in the South and 51 percent in the Midwest. The geographic variation is even starker among select cities: 63 percent of individuals in Los Angeles and 62 percent in San Francisco saw more than a 30 percent change in total income on a month-to-month basis compared to just 49 percent in Detroit and Indianapolis. Income volatility is higher in the West in part because the population is slightly younger there, and younger people are more likely to experience job transitions. Even controlling for age, income level, and gender, individuals in the West still experienced slightly higher month-to-month percent changes in total income. Individuals in the West relied substantially more on volatile sources of income, namely other income (including ATM deposits, payments from other individuals, and business point-of-sale revenue), which may reflect geographic differences in industry mix.

**Figure 6: Percentage of individuals who experienced more than a 30 percent change in total income on a month-to-month basis, by region and select cities\***



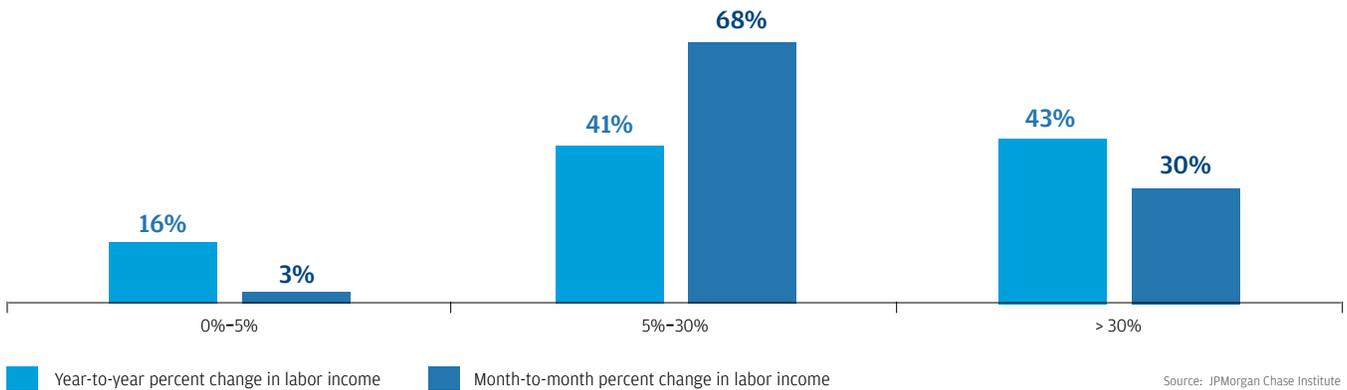
Recognizing that labor income is the largest component of both income and income volatility, we examined further the sources of volatility in labor income. We focused on individuals we assessed as part of what we call the “labor force,” or those whom we identified as individuals with any labor income over the course of our three-year time horizon—October 2012 to September 2015. We observed fluctuations in monthly take-home pay, unadjusted for seasonal or calendar effects. This cash-basis perspective on earnings provided an important lens on the liquidity realities of U.S. individuals.

**Finding  
Two**

Median income individuals experienced nearly \$500 in labor income fluctuations across months, with spikes in earnings larger but less frequent than dips.

We found that 84 percent of individuals experienced at least a 5 percent change in labor income from one year to the next, though there is a broad distribution of percent changes in labor income on a year-to-year and month-to-month basis, as seen in Figure 7.<sup>8</sup> On a month-to-month basis, 97 percent of individuals saw more than a 5 percent average change.<sup>9</sup> Thirty percent of individuals saw monthly changes greater than 30 percent.

**Figure 7: Distribution of absolute percent change in labor income (individuals with any labor income between October 2012 and September 2015)**



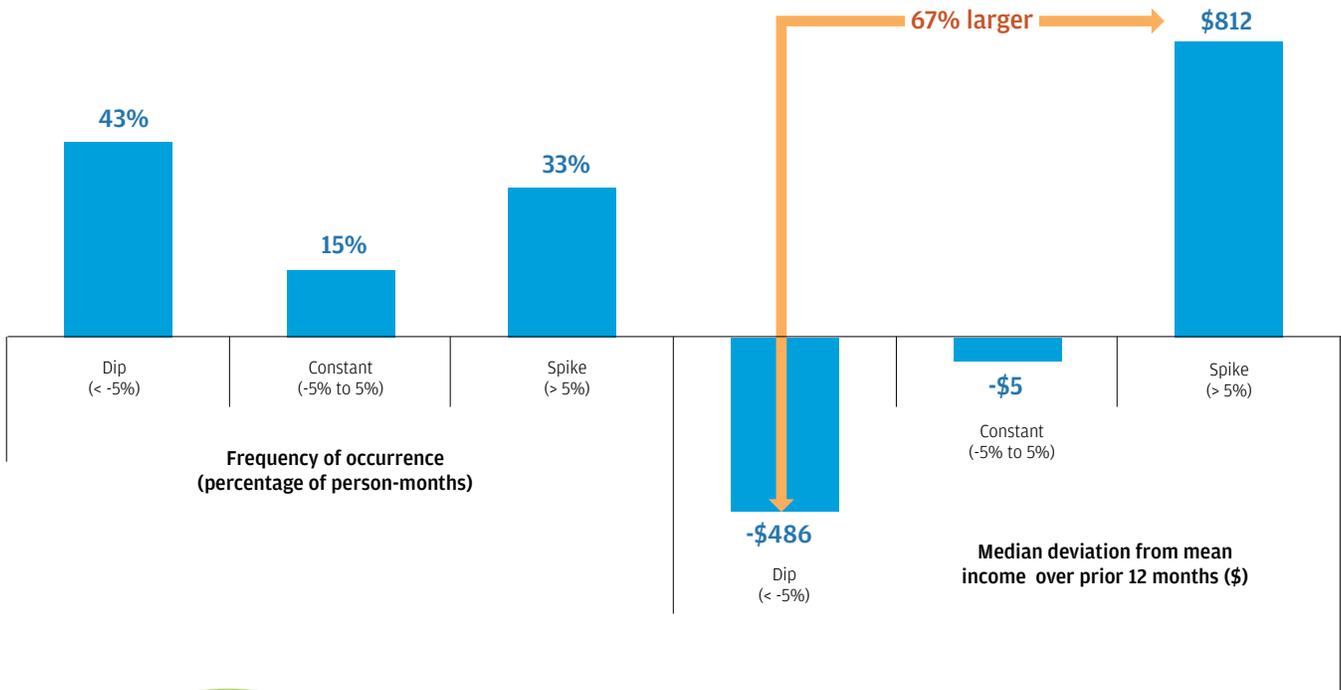
In absolute dollar terms, this volatility translated into an average \$475 change for middle-income individuals. This average reflected a distribution with a median monthly changes of \$194 and changes greater than \$903 one quarter of the time. Predictably, the mean monthly dollar change increased with income levels, but remained around 20 percent of income across income quintiles (Figure 8).

**Figure 8: Mean monthly change in labor income for the median individual, by income quintile (individuals with any labor income between October 2012 and September 2015)**



The volatility we observed captures fluctuations both negative (dips) and positive (spikes). In absolute terms, we found that dips relative to the mean monthly labor income over the prior 12 months were more frequent than spikes, but they were offset by spikes that were 67 percent larger in magnitude. Typical individuals experienced dips in income greater than 5 percent 43 percent of the time, and spikes in income greater than 5 percent 33 percent of the time. However, the median size of a spike was \$812 compared to a median dip of -\$486, in absolute terms 67 percent larger (Figure 9).

**Figure 9: Size and frequency of monthly spikes and dips relative to mean labor income over the prior 12 months (individuals with any labor income between October 2012 and September 2015)**



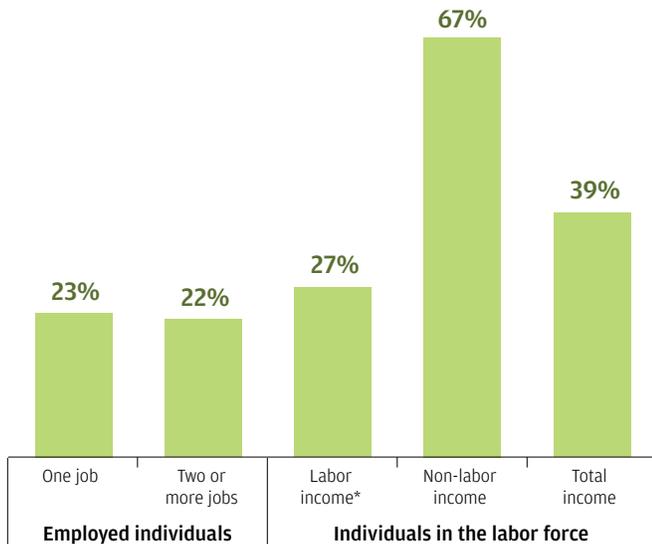
Source: JPMorgan Chase Institute

Now more than ever, income volatility is an important economic phenomenon affecting the welfare of most Americans.

Income volatility was most prevalent among the young, those in the bottom income quintile, and those living in the West.

Other sources of income—whether a secondary job or other non-labor sources of income—did not appear to immunize people from income volatility. Among employed individuals, single versus multiple job holders experienced similar levels of income volatility (Figure 10). These comparisons suggest that it is difficult to compensate for dips in income by increasing income from a secondary job. Moreover, income volatility remained high even when considering additional non-labor components of income. Average percent change in labor income was 27 percent for all individuals, which, when combined with non-labor income, resulted in average monthly changes in total income of 39 percent.

**Figure 10: Average monthly percent change in income for employed individuals by number of jobs and individuals**

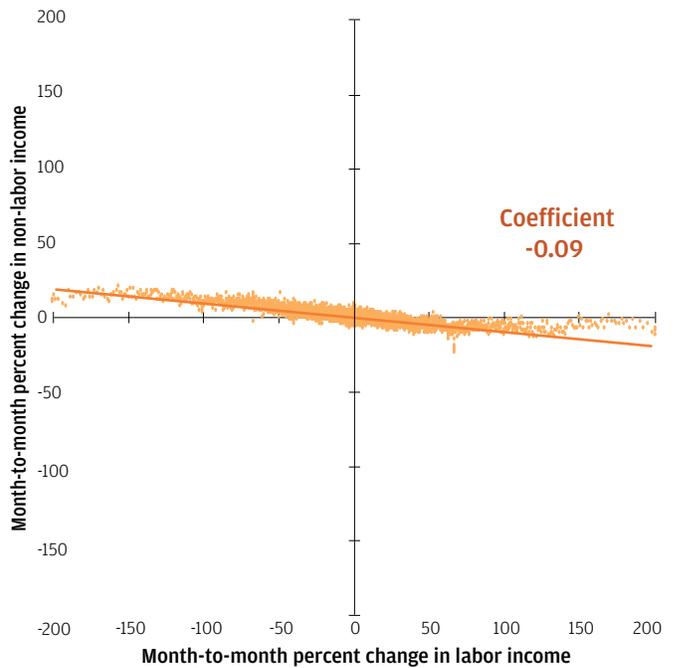


\* Average monthly percent change in labor income of 27 percent is consistent with the distribution reflected in Figure 7. Percentages in Figure 8 reflect the average monthly percent change of median individuals within each income quintile and are, as a result, lower than the average for the entire population reflected here.

Source: JPMorgan Chase Institute

Non-labor components of income did not help mitigate income volatility for two reasons. First, they were more volatile than labor income (average monthly change in non-labor income was 67 percent). Second, labor and non-labor components of income were negatively correlated, but only slightly (Figure 11). A 10 percent increase in labor income was associated with only a 0.9 percent decrease in non-labor income.<sup>10</sup> In other words, individuals experienced high degrees of labor income volatility, and these fluctuations apparently were not easily offset by second jobs or other components of income.

**Figure 11: Percent change in labor income versus percent change in non-labor income**



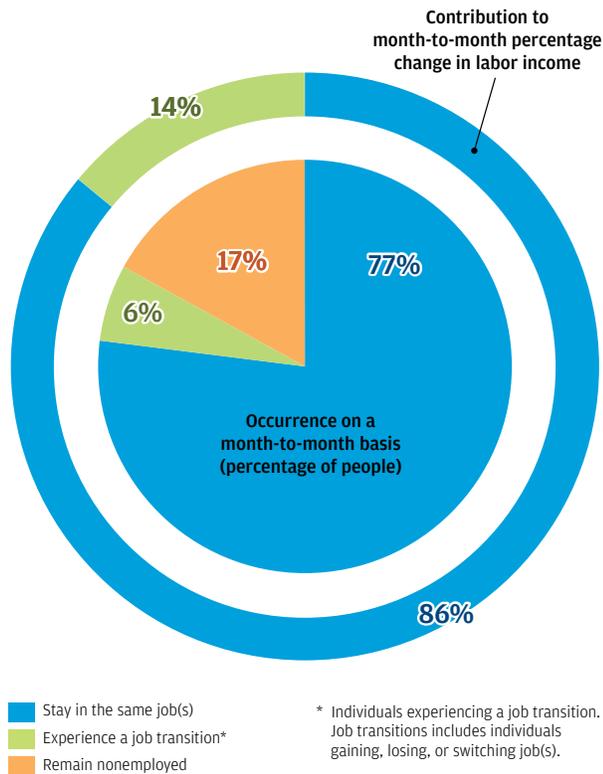
Source: JPMorgan Chase Institute

**Finding  
 Three**

**Most of the month-to-month volatility in take-home pay (86 percent) came from variation in pay within distinct jobs.**

From one month to the next, 77 percent of individuals remained in their jobs, and 53 percent of individuals remained in the same job over the course of a year.<sup>11</sup> Nonetheless, people in continuous jobs experienced high levels of volatility—the median individual experienced a \$590 change in labor income. This within-job variation in pay accounted for 86 percent of the month-to-month variation in labor income.<sup>12</sup>

**Figure 12: Changes in employment on a month-to-month basis and their contribution to monthly percent change in labor income**



Source: JPMorgan Chase Institute

What accounts for the \$590 change in take-home pay people experienced on a month-to-month basis, even as they remained in the same job? We found two key sources of within-job volatility in earnings: variation in paycheck amounts and paycheck frequency effects. We found that there was almost as much volatility in paycheck amounts as there was in monthly earnings at the job level (Figure 13). Summarizing the distribution displayed in Figure 13 into averages, the average percent change between paychecks for all jobs was 22 percent, while the average percent change in monthly earnings for all jobs was 30 percent. We deduced from this comparison that 72 percent (22 percent as a fraction of 30 percent) of within-job volatility existed at the paycheck level. The remaining 28 percent can be ascribed to pay frequency effects.

**Figure 13: Distribution of jobs by average percent change in individual paycheck amounts and monthly job-level earnings (percentage of jobs that appear in consecutive months)**



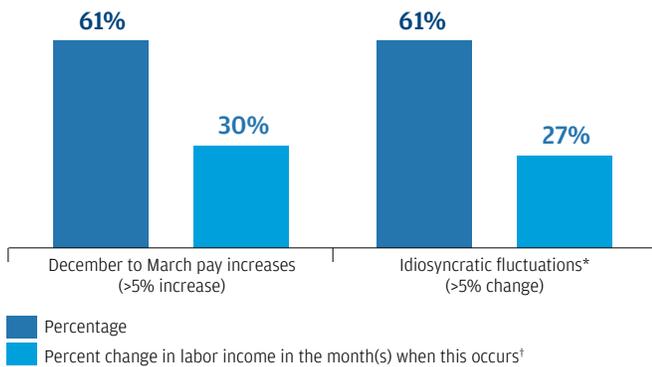
\* Monthly earnings is the sum of all paychecks received from a job in a month.  
 † Up to three months can elapse between paychecks for the job to be considered to be continuous.

Source: JPMorgan Chase Institute

## Variation in paycheck amounts

For almost eight in 10 jobs (82 percent), paycheck amounts varied by more than 5 percent each month, and for nearly one in four jobs (23 percent), paycheck amounts varied by more than 30 percent from paycheck to paycheck. What is the nature of this variation in paycheck amounts? We found that 61 percent of individuals experienced more than a 5 percent increase in earnings at some point between December and March, resulting in a 30 percent increase in pay in the month in which this occurs (Figure 14). Year-end pay increases could be due to an increase in hours during the holiday season or end-of-year bonuses.<sup>13</sup> In addition, 61 percent of individuals experienced other idiosyncratic fluctuations in labor income from their job, resulting in absolute change in labor income of roughly 27 percent either positive or negative. This variation in paycheck amount could stem from variation in hours worked, wages, commissions, or employer deductions and reimbursements.<sup>14</sup>

**Figure 14: Impact of variation in pay amounts (individuals who remain in the same job from month to month)**



\* Idiosyncratic fluctuations could be positive or negative.

† Mean effect reflects all individuals, not just people who see greater than a 5 percent change. See the Data and Methodology section and Figure 35 for a description of the approach to estimating the impact.

Source: JPMorgan Chase Institute

Although most of the variation in paycheck amounts was likely idiosyncratic to individuals, paycheck volatility was evident even across the aggregate population (Figure 15).<sup>15</sup> The average paycheck varied by roughly 8 percent (approximately \$120) from the peak to the trough in a single year. Noticeable in Figure 15 is that average paycheck size was higher in December through March, reflecting an increase in hours during the holiday season or end-of-year bonuses. The second peak that occurs in March reflects the impact of the March 15 deadlines corporations have to pay year-end bonuses in order to apply the expense to the prior fiscal year.<sup>16</sup> It is interesting to note that January in 2013 was not as elevated as January in 2014 and 2015, which may reflect the impact of the income tax increase that took place in

January 2013, which caused many employers to pay bonuses in December of 2012 instead of the first quarter of 2013 (Bureau of Economic Analysis, 2013).

**Figure 15: Mean paycheck amount across all jobs, by month**

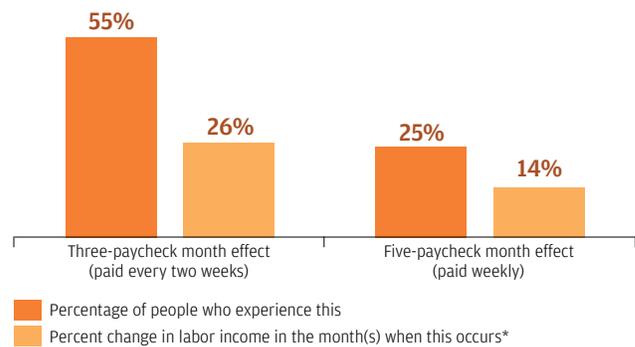


Source: JPMorgan Chase Institute

## Pay frequency and the “five-Friday effect”

The second key source of volatility is pay frequency and the “five-Friday effect,” which accounted for 28 percent of month-to-month volatility in labor income. Eighty percent of individuals had a job that was paid either every two weeks (55 percent) or weekly (25 percent), and therefore received an extra paycheck in months with five Fridays. In five-Friday months in which they earned an extra paycheck, these individuals received, on average, a 26 percent increase in pay for those paid every two weeks and a 14 percent increase in take-home pay for those paid weekly. In other words, extra paychecks in five-Friday months were a positive cash flow reality for 80 percent of American households.

**Figure 16: Impact of pay frequency and the five-Friday effect (individuals who remain in the same job from month to month)**

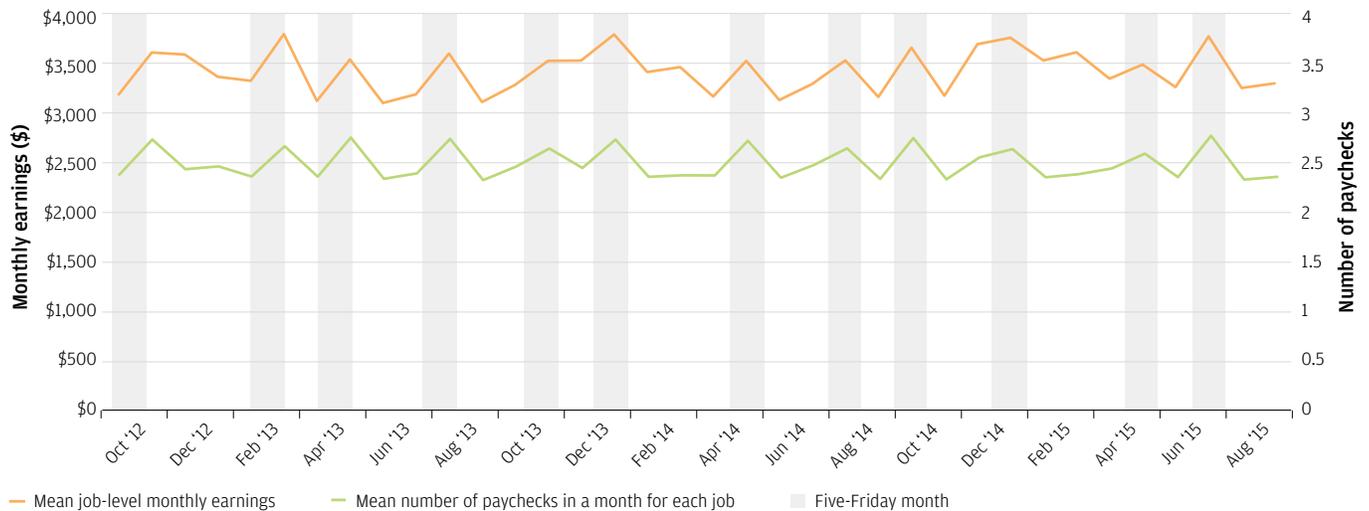


\* See the Data and Methodology section and Figure 35 for a description of the approach to estimating the impact.

Source: JPMorgan Chase Institute

Pay frequency impacts are discernible at the macroeconomic level. Since Friday is the most common payday, the average number of paychecks received increases for individuals in five-Friday months. The prevalence of this effect is so widespread that it resulted in significant increases in monthly earnings for the employed population in aggregate in those months, as shown in Figure 17. Given that almost 40 percent of expenditures, including rent and all installment loans, have a fixed per-month amount regardless of the number of days in the month, paying bills may be harder in months without the extra paycheck.<sup>17</sup> Although this effect is entirely predictable by looking at a calendar, five-Friday months may not always be anticipated, since they occur in different months each year.

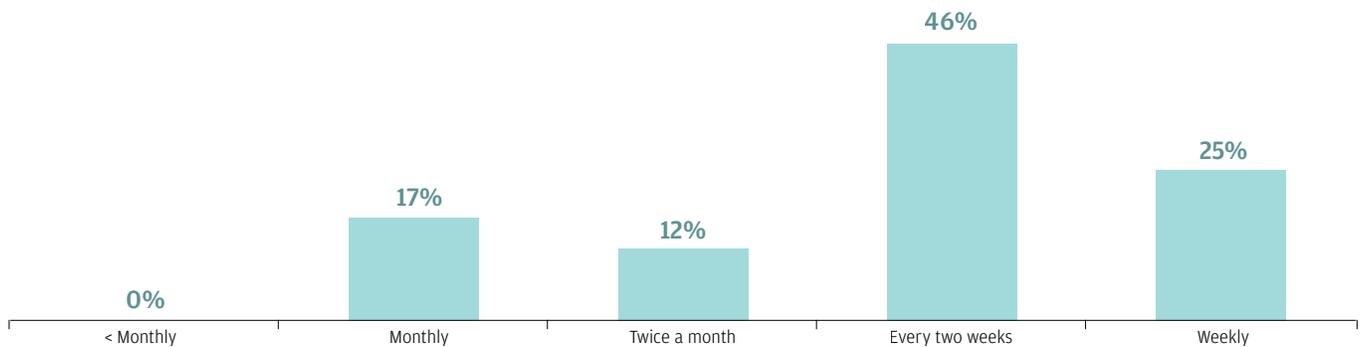
**Figure 17: Mean job-level monthly earnings and number of paychecks**



Source: JPMorgan Chase Institute

The five-Friday effect stems from the fact that almost half of all jobs (46 percent of jobs and 55 percent of individuals) paid every two weeks, and another 25 percent of jobs (also 25 percent of individuals) paid weekly.<sup>18</sup> The remaining one-third of jobs paid twice a month (12 percent), monthly (17 percent), or less than monthly (0.5 percent).<sup>19</sup> Individuals with jobs that paid every two weeks—roughly 46 percent of jobs (55 percent of individuals)—received three paychecks (rather than two) in two months out of the year. Individuals paid weekly—roughly 25 percent of jobs (also 25 percent of individuals)—received five paychecks (rather than four) in four months out of the year.

**Figure 18: Distribution of jobs by pay frequency (jobs that last a minimum of three months)**



Source: JPMorgan Chase Institute

Having explored the sources of within-job income volatility, which accounts for 86 percent of labor income volatility, we now turn to the remaining 14 percent of labor income volatility, which we attribute to job transitions.

**Finding  
Four**

Almost four in 10 individuals experienced a job transition in a given year, contributing 14 percent of the month-to-month volatility in labor income.

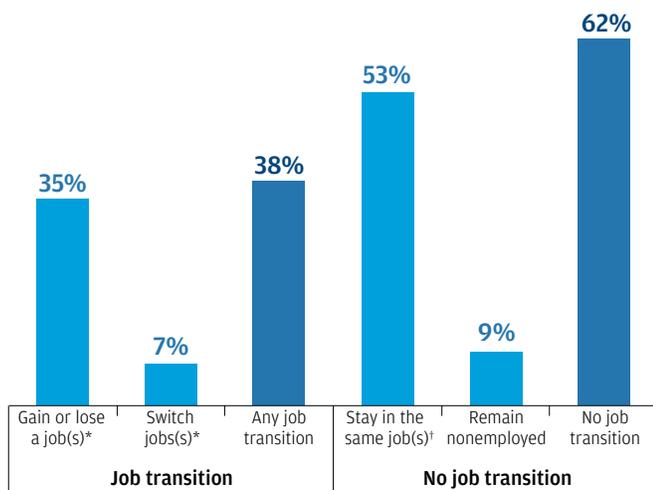
Although the magnitude of labor income changes was larger when someone stopped, started, or switched a job, compared to when someone stayed in the same job, on a month-to-month basis only 6 percent of individuals experienced a job transition. As a result, job transitions contribute 14 percent of the month-to-month change in labor income, while within-job variation in pay accounted for 86 percent of the month-to-month variation in labor income. In any given year, though, roughly four in 10 individuals gained or lost a job(s) (35 percent) or switched jobs (7 percent) (Figure 19). Fifty-three percent of individuals held the same job(s), and 9 percent remained unemployed.<sup>20</sup>

These employment transitions were significant sources of volatility over the course of a year because they yielded large absolute changes in labor income when they occurred. The median individual experienced a change in income of \$1,108 when gaining or losing a job, and a change of \$830 upon

switching from one job (or jobs) to the next. This represents a tremendous degree of job mobility over the course of the year for an individual or household to manage. Further, this volatility may require extra liquidity to weather not only volatility in earnings, but also gaps in employment and workplace benefits.

As we have seen, many individuals—especially younger workers, those with lower incomes, and those who live in the West—experienced a great deal of volatility. Moreover, income volatility was high even for those holding multiple jobs, or when we examine total income. Most of this volatility stemmed from volatility in earnings within a stable, continuous job rather than from transitions between jobs. And within-job volatility in earnings was generated by both pay frequency and variation in pay amounts. We extend this investigation in Part II of this paper by exploring the influence of the Online Platform Economy.

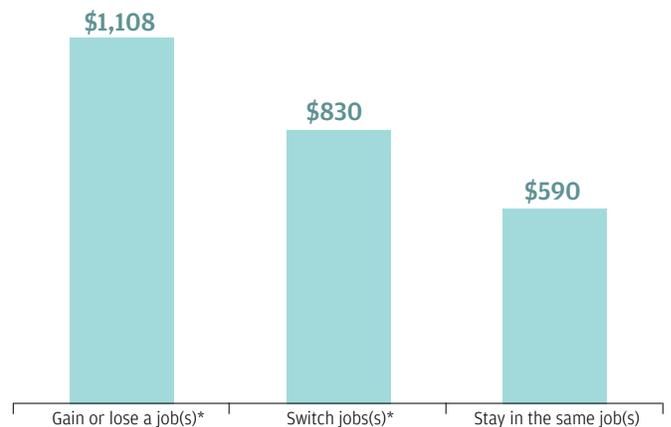
**Figure 19: Frequency of occurrence of job transitions over a given year**



\* These two job transitions are not mutually exclusive over a 12-month period, and may reflect changes in enrollment in direct deposit of payroll into a Chase account or change in job status of a secondary account holder.

† Temporary gaps in pay of up to three months within the same job are counted as staying in the same job. Individuals without direct deposit into a Chase account may appear as not employed.

**Figure 20: Mean absolute change in monthly labor income for the median individual in the month when this occurs**



\* The absolute change in monthly labor income as a result of a job switch reflects not only changes in wages, but also end-of-job payouts (e.g., cashing out on vacation) as well as time taken off between jobs.

# Part II: The Online Platform Economy

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## Labor Platforms

Participants perform discrete tasks



## Capital Platforms

Participants sell goods or rent assets



Connects workers or sellers directly to customers



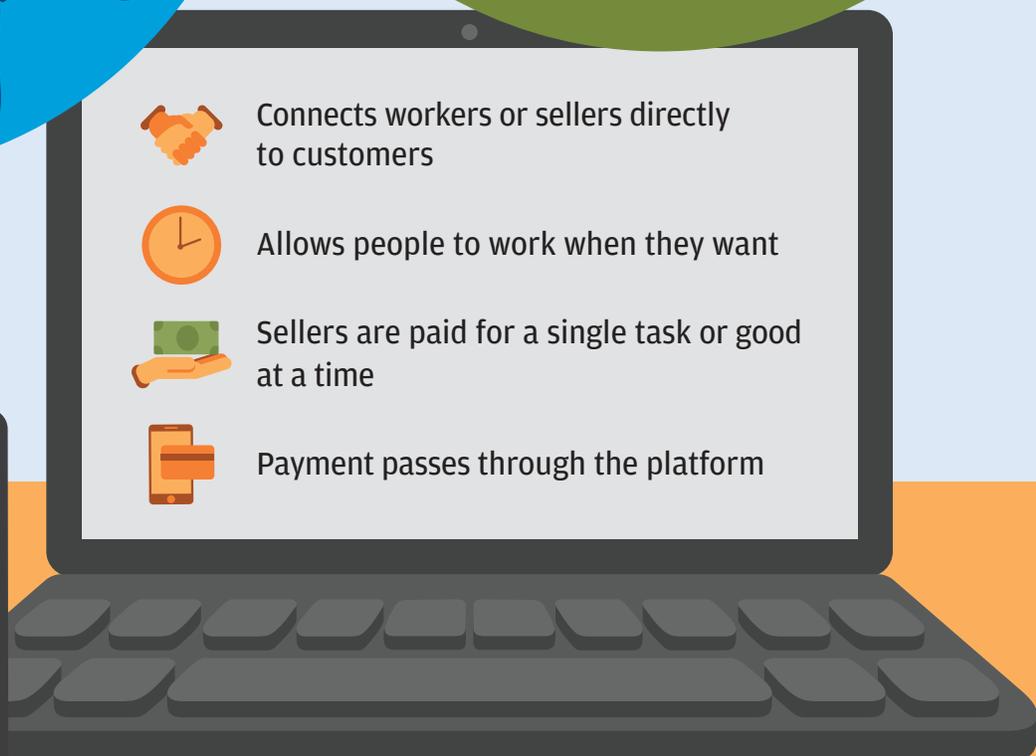
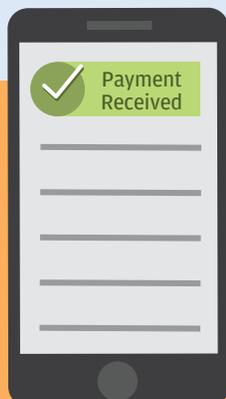
Allows people to work when they want



Sellers are paid for a single task or good at a time



Payment passes through the platform



## Defining the Online Platform Economy

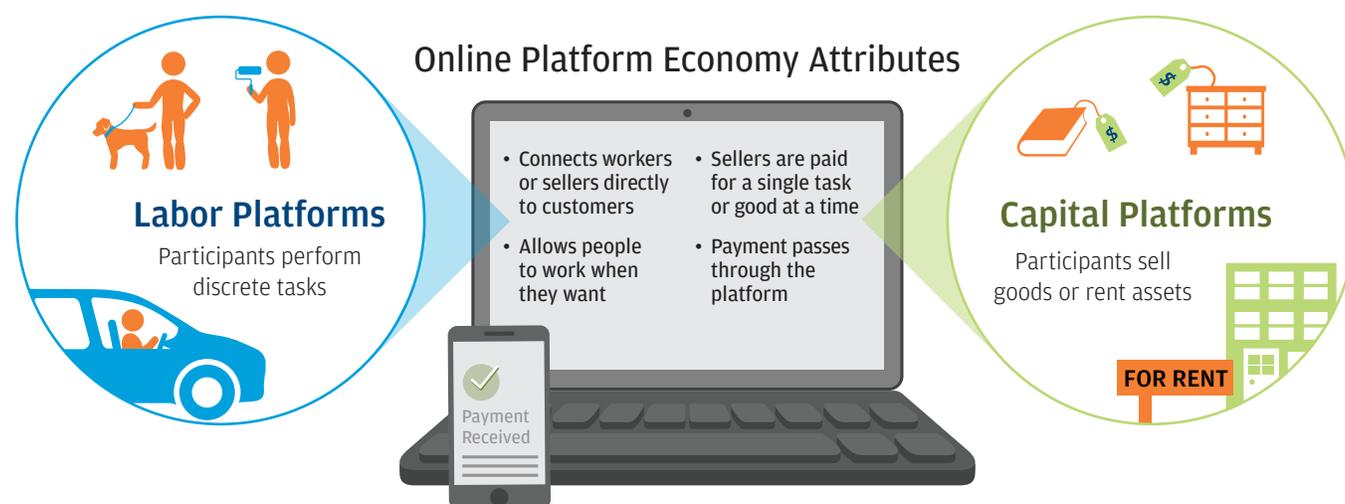
As a fast-growing and highly accessible new marketplace for work, many have characterized the Online Platform Economy as the “future of work.” The next question is whether the platform economy will become the “future of income.” Such an idea has big implications, especially in relation to income volatility. As we demonstrated in Part I, many individuals—including the young, lower-income individuals, and people living in the West—already experience a great deal of income volatility. As we show, these are also the very individuals who are most likely to participate in the platform economy. An important question, then, is whether the platform economy helps individuals mitigate income volatility in their financial lives, or whether it’s a source of volatility in its own right.

To begin, we defined the Online Platform Economy as economic activities involving online intermediaries that are marked by four characteristics:<sup>21</sup>

1. They provide an online platform that connects workers or sellers directly to customers.
2. They allow people to work when they want. Participants can choose to pick up a passenger today, or rent their apartment this weekend, or not.<sup>22</sup>
3. They pay on a “piece-rate” basis for a single task or good at a time.<sup>23</sup>
4. They intermediate or facilitate payment for the good or service.

We distinguished between labor and capital platforms within our analysis (Figure 21). Labor platforms, such as Uber or TaskRabbit, often referred to as the “Gig Economy,” connect customers with freelance or contingent workers who perform discrete tasks or projects.<sup>24</sup> Capital platforms, such as eBay or Airbnb, connect customers with individuals who rent assets or sell goods peer-to-peer. We find that labor and capital platforms are quite distinct from each other in who uses them, the prevalence and frequency of use, and the degree of reliance on platform earnings.

Figure 21: The Online Platform Economy



This report offers unprecedented, detailed insight into the financial lives of more than 260,000 participants in the Online Platform Economy within our anonymized sample, from October 2012 to September 2015. These individuals received income from at least one of 30 distinct platforms over this three-year period. Federal statistics on the contingent workforce are more than 10 years out of date, and many believe more recent national statistics belie the rise of independent work, particularly that of the platform economy.<sup>25</sup> Although recent estimates for labor platform participation hover around 1 percent of the labor force or less, the number of independent contractors participating in the platform economy has been growing (Hall and Krueger, 2015; McKinsey Global Institute, 2015).

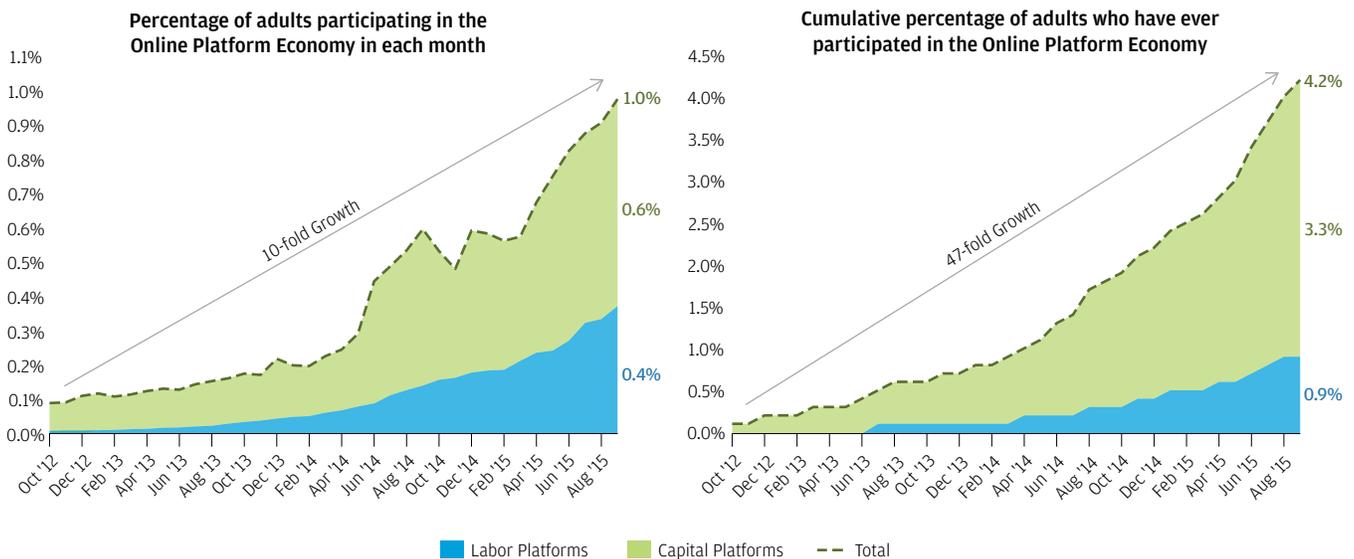
**Finding Five**

Although 1 percent of adults earned income from the Online Platform Economy in a given month, more than 4 percent participated over the three-year period.

In September 2015, 1 percent of adults actively earned income from the Online Platform Economy.<sup>26</sup> This monthly participation rate increased 10-fold over the three-year period. Cumulatively, more than 4 percent of adults received income from the platform economy over the three years. This cumulative participation rate increased 47-fold over the three years. It is worth noting that, in this rapidly evolving market, the rate of growth was not stable or constant over the three years and, notably, 2015 growth decelerated relative to the two prior years. Although labor platforms are growing more rapidly than capital platforms, the capital platform market is still significantly larger. In any given month, 0.4 percent of adults (40 percent of all platform participants) received earnings from labor platforms and 0.6 percent of adults (62 percent of all participants) received income from capital platforms. Among all participants over the three years, 21 percent participated in labor platforms, 78 percent participated in capital platforms, and 2 percent participated in both.<sup>27</sup>

Earnings from the platform economy showed a similar trajectory. Total earnings increased almost 10-fold from October 2012 to September 2015, but earnings from labor platforms grew 54-fold over the three-year period compared to earnings from capital platforms, which grew sixfold. While labor participants represented 40 percent of total participants in September 2015, they earned 44 percent of the total dollars in September 2015 (Figure 22).

**Figure 22: Monthly and cumulative participation in the Online Platform Economy**



Source: JPMorgan Chase Institute

Participants in the Online Platform Economy—both labor and capital platforms—are significantly younger than the general population (Figure 23). Otherwise, labor platform participants and capital platform participants have quite different profiles. Compared to the full JPMorgan Chase Institute sample, labor platform participants tend to have lower incomes than average. They are more likely to be male and live in the West. In contrast, capital platform participants are more comparable to the full JPMC Institute sample in terms of gender and geography. However, they tend to have higher monthly income than the full Institute sample but slightly lower monthly income than the subset of individuals we characterize as in the labor force.

**Figure 23: Demographic characteristics of Online Platform Economy versus the JPMorgan Chase Institute sample and the U.S. population**

	U.S. Adult Population*	JPMorgan Chase Institute Sample**		JPMorgan Chase Institute Online Platform Economy Sample‡	
		All	In the Labor Force (Labor Income Ever Observed)	Participants in Online Labor Platforms	Participants in Online Capital Platforms
<b>Number</b>		1,000,000	744,486	58,685	207,135
<b>18-24</b>	13%	4%	5%	7%	7%
<b>25-34</b>	18%	21%	24%	36%	34%
<b>35-44</b>	17%	21%	23%	25%	23%
<b>45-54</b>	18%	20%	22%	17%	18%
<b>55-65</b>	16%	16%	16%	9%	11%
<b>65+</b>	19%	18%	11%	6%	7%
<b>Women</b>	51%	45%	45%	33%	49%
<b>Men</b>	49%	55%	55%	67%	51%
<b>Midwest</b>	21%	21%	22%	20%	20%
<b>Northeast</b>	18%	20%	20%	12%	22%
<b>South</b>	38%	28%	28%	26%	25%
<b>West</b>	24%	31%	30%	42%	33%
<b>Median monthly income (\$)</b>	\$2,396†	\$2,837	\$3,351	\$2,514	\$3,218

\* Unless otherwise noted, national estimates come from the Census Bureau's American Community Survey 2014 1 Year Estimates.

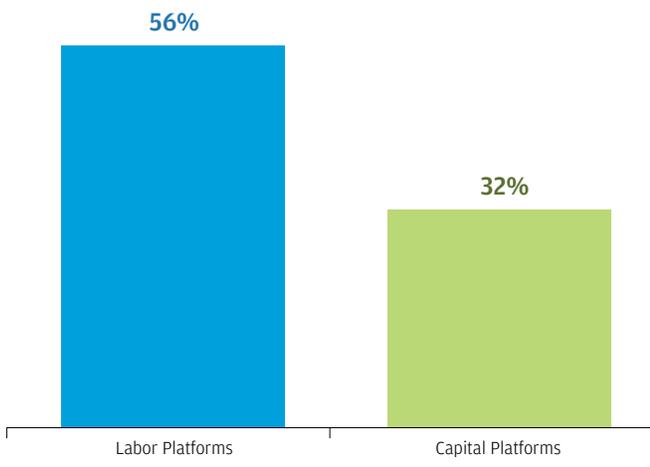
† Estimates are from the 2014 Current Population Survey and represent individual income estimates.

\*\* The 1 million person sample was randomly selected from a total of 6.3 million individuals who had a checking account for all 36 months between October 2012 and September 2015 and a minimum of five outflow transactions in every month. Demographic attributes reflect 2015 estimates. Demographic attributes are identical for the 1 million random sample and the full 6.3 million individuals who met these criteria, except that median monthly income is \$2,838 for all 6.3 million individuals and \$3,521 for individuals for whom we observed any labor income between October 2012 and September 2015.

‡ Out of a total universe of 6.3 million individuals who had a checking account for all 36 months between October 2012 and September 2015 and a minimum of five outflow transactions in every month, the Online Platform Economy sample includes 265,820 individuals who received income at least once from one of 30 distinct platforms. Demographic attributes reflect 2015 estimates.

After the first month of platform participation, further participation was quite sporadic (Figure 24). Individuals earned money on platforms in only 56 percent of subsequent months for labor platforms and 32 percent of subsequent months for capital platforms. This highlights the degree to which individuals cycle in and out of the platform economy.

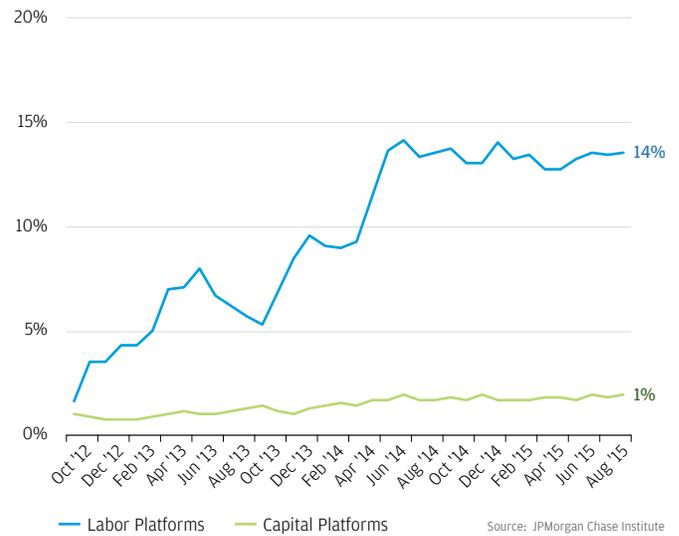
**Figure 24: Percentage of months in which individuals earn platform income after the initial month of participation**



Source: JPMorgan Chase Institute

The share of individuals using multiple platforms was also quite low, but was higher for labor platforms than capital platforms. As of September 2015, the share of labor platform participants using multiple platforms appears to have stabilized around 14 percent, compared to just 1 percent of capital platform participants.<sup>28</sup>

**Figure 25: Share of participants with income from multiple platforms**



Source: JPMorgan Chase Institute

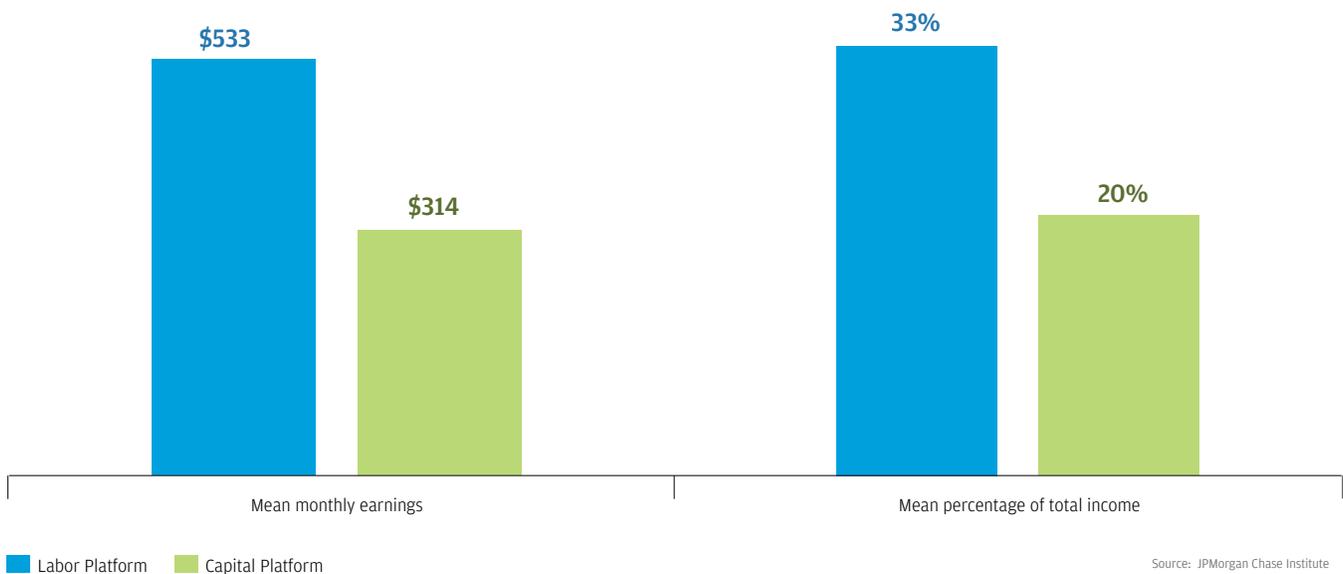
Although the sheer number of people participating in the Online Platform Economy increased rapidly, participants' reliance on platform earnings remained stable over time.

## Finding Six

### The Online Platform Economy was a secondary source of income, and participants did not increase their reliance on platform earnings.

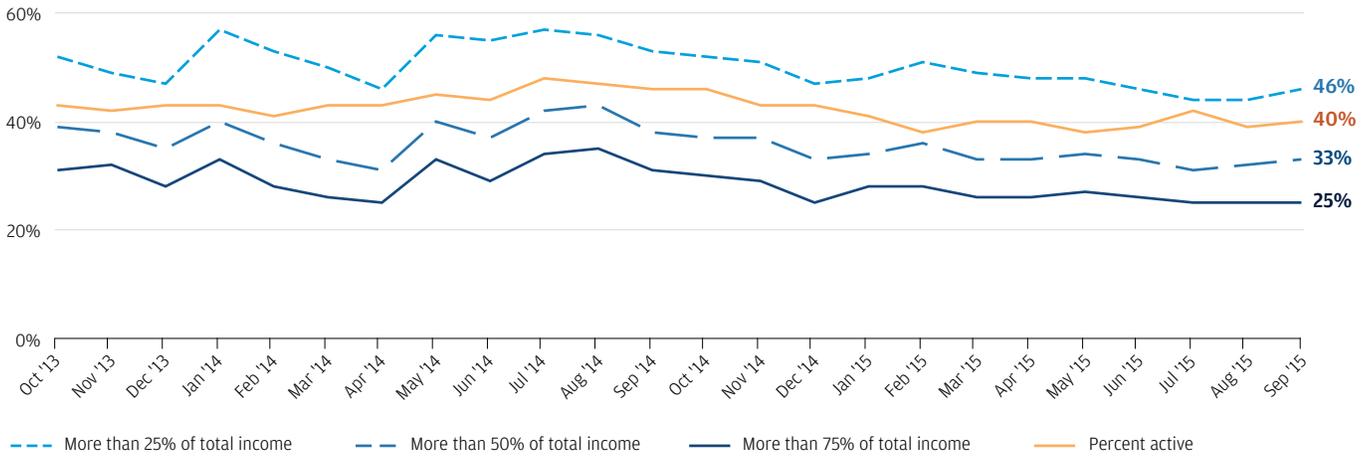
In the months when individuals were actively participating, platform earnings represented a sizable but still secondary source of income. Average monthly earnings in participation months was \$533 for labor platforms, representing 33 percent of total monthly income, and \$314 for capital platforms, representing 20 percent of total monthly income (Figure 26).<sup>29</sup> In September 2015, among all individuals who participated over the three-year period (active or not in that particular month), the vast majority—82 percent of labor platform participants and 96 percent of capital platform participants—relied on platform earnings for less than 25 percent of their income.

Figure 26: Monthly platform earnings in active months, in dollars and as a percentage of total income



Although the sheer number of people participating has increased rapidly, a critical question is whether individuals are deepening their reliance on platform income, either by participating more often or by earning a larger fraction of their total income from platforms over time. We found that neither had occurred.<sup>30</sup> Reliance on labor platforms has remained stable over time in terms of both the fraction of months that participants are active and the fraction of total income earned on platforms in active months (Figure 27). As of September 2015, labor platform income represented more than 75 percent of total income for 25 percent of active participants.<sup>31</sup> Almost half of active labor participants (46 percent) relied on labor platforms for more than 25 percent of their income. In any given month, 40 percent of all individuals who participated in labor platforms were actively earning on them. In fact, the time series in Figure 27 suggests that reliance may have decreased slightly. This slight downward trend in reliance might reflect a broadening of the participation base to include newcomers, or those who participated on a more part-time basis.

**Figure 27: Reliance on, and active participation in, labor platforms\***

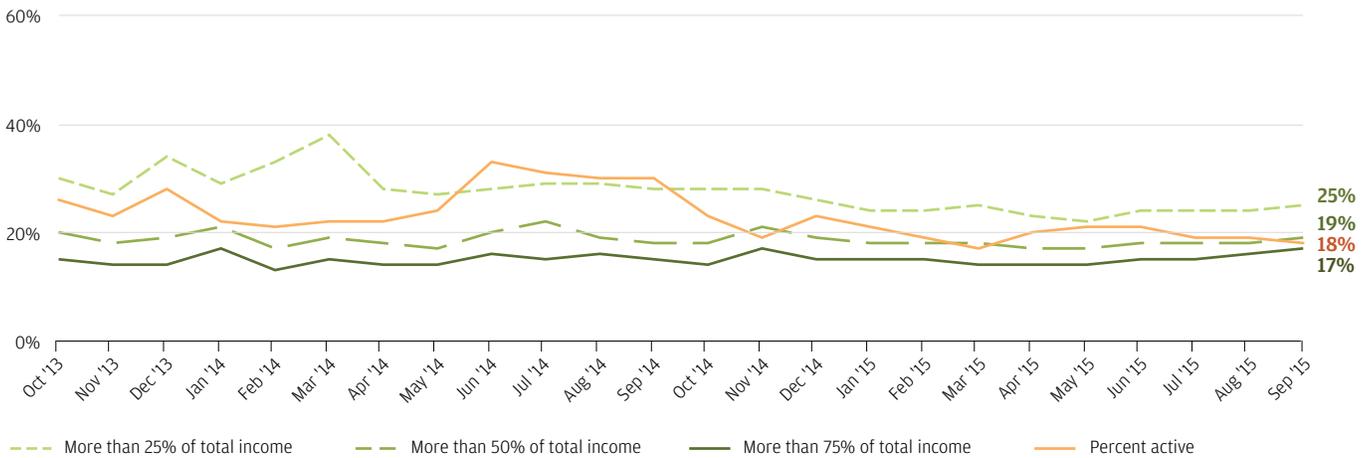


\* Data are shown only for a two-year period, since the percentage of participants active is mechanically 100 percent in the first month. Time series are otherwise consistent in the first year; the percentage of individuals who rely on labor platform earnings for more than 75 percent of total income is 25 percent in October 2012.

Source: JPMorgan Chase Institute

Reliance on capital platforms was significantly lower than on labor platforms but also very stable (Figure 28). In September 2015, just 25 percent of active participants relied on capital platforms for more than 25 percent of their income, including 17 percent of active participants who earned 75 percent or more of their total income from capital platforms. The stability of these numbers suggests that individuals were not becoming more reliant on platform earnings over time.

**Figure 28: Reliance on, and active participation in, capital platforms\***



\* Data are shown only for a two-year period, since the percentage of participants active is mechanically 100 percent in the first month. Time series are otherwise consistent in the first year; the percentage of individuals who rely on capital platform earnings for more than 75 percent of total income is 18 percent in October 2012.

Source: JPMorgan Chase Institute

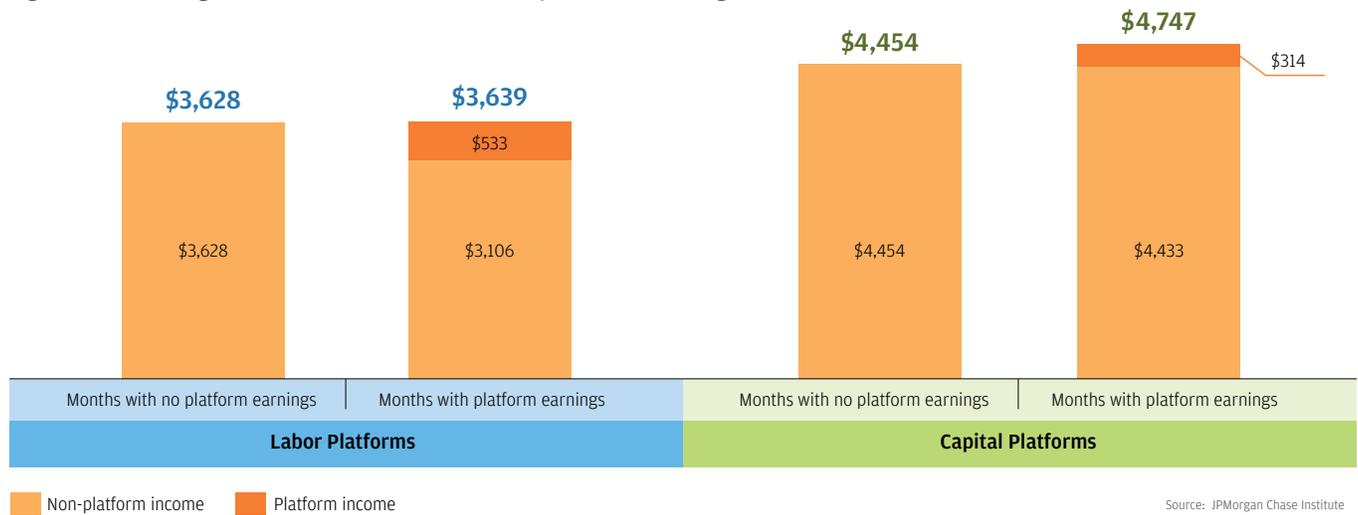
A core value proposition of the Online Platform Economy is that it may provide more flexibility for people to supplement their incomes when their primary job earnings fall short of expenses. We next explore whether platform earnings help to offset dips in non-platform income.

# Finding Seven

## Earnings from labor platforms offset dips in non-platform income, but earnings from capital platforms supplemented non-platform income.

We found an important distinction between labor and capital platforms insofar as they contributed to volatility. In aggregate, labor platform earnings appeared to largely substitute for a 14 percent shortfall in non-platform income in months with platform earnings (Figure 29). In months with labor platform earnings, those earnings contributed an additional 15 percent of income, increasing total income by less than 1 percent, from \$3,628 (in months with no platform earnings) to \$3,639 (in months with platform earnings).<sup>32</sup> For capital platform participants, though, platform earnings tended to supplement rather than substitute for traditional income. Non-platform income was less than 1 percent lower in months with platform earnings, and capital platform earnings contributed another 7 percent, resulting in a total income of \$4,747, roughly 7 percent higher than in months with no platform earnings (\$4,454).

Figure 29: Earnings in months with and without platform earnings



To further corroborate this finding, Figure 30 displays the share of platform participants employed in a non-platform job before participation in the Online Platform Economy and after. Fewer people were employed in traditional jobs once they started their platform career. For labor platform participants, the share dropped from 77 percent to 69 percent in months when labor platform participants were not generating platform earnings. That share dropped even further to 62 percent in months with platform earnings. This pattern suggests that individuals relied on labor platform work not only when outside income dipped, but also when they were between jobs. Interestingly, capital platform participants were also less likely to be employed in a traditional job after their first month of participation in the platform economy (75 percent were employed before their platform career compared to 62 percent employed during their platform career in months without earnings). However, their employment status differed little between months with and without platform earnings; 62 percent are otherwise employed in months without platform earnings compared to 60 percent in months with platform earnings.

Figure 30: Share of platform participants employed in a non-platform job prior to and after their first month of participation in the Online Platform Economy (OPE)

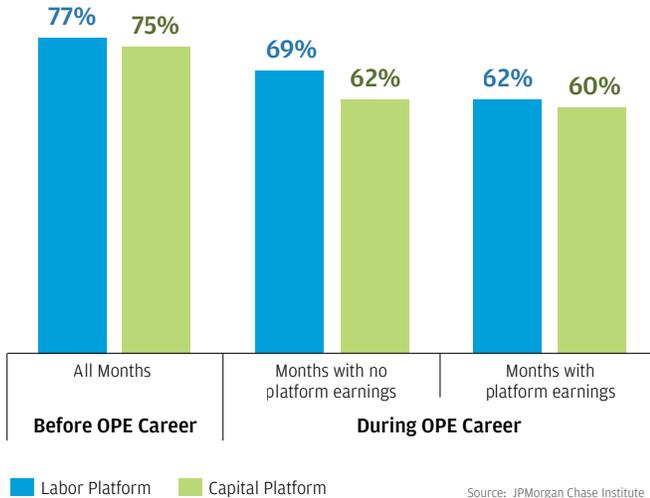
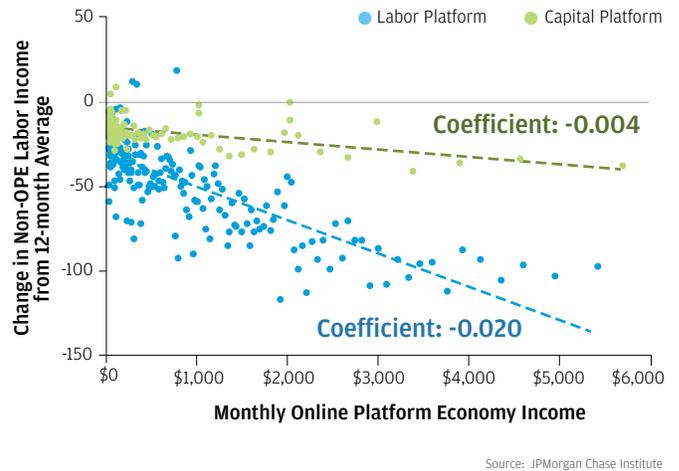


Figure 31: Labor platform earnings versus the percent deviation in monthly non-platform labor income from the mean monthly non-platform labor income over the prior 12 months



We next examined the relationship between platform earnings and income volatility. Figure 31 displays a scatterplot of platform earnings on the horizontal axis and the percent deviation in monthly non-platform income from its average over the prior 12 months on the vertical axis. There is a negative correlation between labor platform earnings and changes in non-platform income. In other words, labor platform earnings were higher in months when participants experienced a dip in non-platform income. This further suggests that labor platform earnings were used as a substitute for non-platform earnings.

In summary, we found that participation in the Online Platform Economy was 1 percent on a month-to-month basis over the last three years, largely driven by capital platforms, and was a substantial but still secondary source of income. However, individuals cycled in and out of platform work, so income was sporadic from month to month. There was tremendous growth in participation in the platform economy over three years, driven entirely by new entrants rather than a deepening in reliance among existing participants. Earnings from labor platforms helped mitigate volatility in labor income, but earnings from capital platforms did not. In the months in which they earned labor platform income, individuals were 7 percentage points less likely to have a non-platform job, and their non-platform income was 14 percent lower. Labor platform earnings tended to substitute for a shortfall in non-platform income, whereas capital platform earnings largely supplemented non-platform income.

Individuals relied on labor platform work when outside income dipped and when they were between jobs.

# Conclusion

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This study sheds new light on the sources of income volatility, as well as on the growing Online Platform Economy. These two phenomena are closely linked. Many questions raised about the platform economy are best understood within the context of income volatility and the broader labor market. Likewise, an analysis of the platform economy gives us deeper insight into the choices individuals make when faced with income swings, and thus helps us better understand the broader impact of income volatility on individuals' budgets.

For policymakers and others who care about the financial health of American workers, income volatility—including the increasing impact of platform income—has important implications. We conclude this report by describing those implications.

## Implications of income volatility

First, this study highlights the importance of asset building so that families have enough liquidity to weather volatility in income and spending. In our report *Weathering Volatility*, we estimated that median-income families had a shortfall of \$1,800 in liquid assets necessary to weather concurrent spikes in spending and dips in income observed in our data (Farrell and Greig, 2015). Others estimate that 44 percent of U.S. households are liquid-asset poor (Brooks et al., 2015).

Second, this study shines a light on upswings in income that could be savings opportunities. That spikes in income are generally larger in magnitude but less frequent than dips suggests that saving during upswings is critical to maintaining financial security. Key, predictable savings opportunities include five-Friday months for individuals with jobs that pay every two weeks or weekly. Although entirely predictable, five-Friday months occur in different months each year, and thus some individuals may not anticipate the timing of them. Financial products could help people automatically save that extra paycheck in five-Friday months. Other opportunities to save include year-end bonuses that occur between December and March, as well as tax season for those who receive tax refunds. Financial services companies could play a more active role in creating opportunities for savings decisions.

Third, the five-Friday effect also reveals a structural disconnect between typical employer pay cycles and billing cycles. Two-thirds of jobs pay every two weeks or weekly and therefore deliver an extra paycheck in months with five Fridays, affecting 80 percent of individuals. We estimate that almost 40 percent of

expenditures, including mortgage or rent payments, installment loans, and insurance payments, have a fixed per-month expense regardless of the number of days in that month. These fixed costs are much easier to cover during, or shortly after, months with an extra paycheck. Fixed costs could be much more difficult to cover in four-Friday months, particularly a month like April 2014, which was the third of three consecutive four-Friday months. This mismatch in pay cycles and billing cycles might cause people to feel more of a liquidity crunch, potentially affecting consumer and credit markets at the macroeconomic level.

Financial institutions, utilities, and landlords can ameliorate the mismatch by offering payment cycles that better match paycheck cycles. These could include options to make debt, utility, or rent payments every two weeks or every four weeks, instead of once a month. Individuals could have the option to keep the payment amount calibrated at the monthly amount to help pay down a principal faster.

To the extent consistent with existing regulations, employers could also play a key role in either mitigating volatility altogether or better matching pay cycles to typical billing cycles for their employees. Employers could, for example:

- Pay their employees the same number of times each month to eliminate the five-Friday effect;
- Provide more stability and predictability in scheduling for hourly workers;
- Offer employees the option to receive end-of-year bonuses in more incremental installments over the course of the year; or
- Time the many employer deductions, such as 401(k) contributions and charitable contributions, in such a way to even out take-home pay for each individual.

Most states have pay frequency regulations that solve for multiple objectives (U.S. Department of Labor, 2015). This JPMorgan Chase Institute report presents new facts regarding the implications of different pay cycles that are worth consideration in developing and refining such regulations. It is also worth noting that a number of financial technology companies are beginning to intermediate employer pay cycles by allowing workers to elect their own pay cycles, in some cases as frequently as daily. Increasingly, employers, including online platforms, are allowing individuals to choose how frequently they are paid.

Finally, income volatility is a structural reality that should be considered for means testing, both in the private sector and in government assistance programs. Income or ability to pay is a key consideration for mortgage decisions, credit extensions, and bankruptcy proceedings. However, self-reported income or a single paystub may give little insight into the volatility in earnings an individual experiences. Income volatility is also an important consideration for social assistance programs, such as Supplemental Nutrition Assistance Program, Earned Income Tax Credits, and Medicaid, many of which have income-based eligibility requirements. Income volatility causes people to cycle in and out of eligibility status, which others have shown to decrease program participation rates (Gundersen and Ziliak, 2008). These policies in both business and public spheres would benefit from explicitly taking into account the reality of income volatility.

## Implications of the Online Platform Economy

This study is the first of its kind to shed light on the Online Platform Economy using financial transactions, and provides an important foundation for the many policy and economic debates related to what some have termed the “future of work.” Over the last three years, 4.2 percent of adults, an estimated 10.3 million people—more than the total population of New York City—earned income on the platform economy. This number increased 47-fold over three years from October 2012 to September 2015. We estimate that, as of September 2015, in any given month roughly 1 percent of adults, or about 2.5 million people, earned income on these platforms. Those earnings represent roughly 20 to 30 percent of total income, depending on the type of platform.

A key question concerns the nature of platform work and employment. Within a traditional employer-employee relationship, workers can usually expect benefits like access to unemployment insurance, employer contributions to Social Security, and worker’s compensation, among others. Typically, no such “social contract” exists in the Online Platform Economy, and some policymakers and labor advocates have raised concerns about whether workers on these platforms are misclassified as independent contractors and therefore entitled to these and other protections under the law.

This paper offers important new facts to inform these debates. First, labor and capital platforms are distinct marketplaces that have different characteristics. While they both draw from a substantially younger population than the general population, labor platforms tend to attract slightly lower-income individuals, more men, and more individuals from

western states than capital platforms do. Second, attachment to platform work is relatively low. Among those who have participated, only 56 percent actively earned income on labor platforms and only 32 percent actively earned income on capital platforms in any given month after their first month on the platforms. Third, reliance on platform earnings was not increasing for individuals. Individuals were neither participating more consistently nor earning more money in active months. Earnings from labor platforms do, though, tend to substitute for a shortfall in non-platform income, whereas capital platform earnings tend to supplement non-platform income. These facts provide an essential, data-driven foundation for policymakers debating proposals for new labor laws, such as the creation of a new class of workers, portable benefits for independent contractors, and eligibility for social safety net programs like unemployment insurance.

The Online Platform Economy also adds an important new element to existing labor markets, where finding new or additional work typically involves a lot of effort and high transaction costs. Simply put, landing a platform job is often easier and quicker. Likewise, individuals can, and do, generate additional income on labor platforms in a timely fashion when they experience a dip in regular earnings. This is a potentially far better option to mitigate or weather volatility if the alternatives are to constrain spending, to take on additional (potentially high-cost) credit, or to become delinquent on existing loans. Moreover, this option meets a target need. Participation in labor platforms is highest precisely among those who experience the highest levels of income volatility—the young, the poor, and individuals living in the West.



# Data and Methodology

In this report, the JPMorgan Chase Institute sought to inform the public debate on the state of individuals' income volatility in the United States and the emergence of the Online Platform Economy. To develop insights into these topics, we adapted the Bank's internal consumer data on 28 million anonymized U.S. checking account customers. As the first financial institution to channel this wealth of information for the benefit of the public good, JPMorgan Chase has strong guardrails and strict privacy protocols in place to protect personal information throughout the creation and analysis of this data asset. A description of these protocols is available on our [website](#).

## Data Privacy

The JPMorgan Chase Institute has adopted rigorous security protocols and checks and balances to ensure all customer data are kept confidential and secure. Our strict protocols are informed by statistical standards employed by government agencies and our work with technology, data privacy, and security experts who are helping us maintain industry-leading standards.

There are several key steps the Institute takes to ensure customer data are safe, secure and anonymous:

- Before the Institute receives the data, all unique identifiable information—including names, account numbers, addresses, dates of birth, and Social Security numbers—is removed.
- The Institute has put in place privacy protocols for its researchers, including requiring them to undergo rigorous background checks and enter into strict confidentiality agreements. Researchers are contractually obligated to use the data solely for approved research, and are contractually obligated not to re-identify any individual represented in the data.
- The Institute does not allow the publication of any information about an individual consumer or business. Any data point included in any publication based on the Institute's data may only reflect aggregate information.
- The data are stored on a secure server and can be accessed only under strict security procedures. The data cannot be exported outside of JPMorgan Chase's systems. The data are stored on systems that prevent them from being exported to other drives or sent to outside email addresses. These systems comply with all JPMorgan Chase Information Technology Risk Management requirements for the monitoring and security of data.

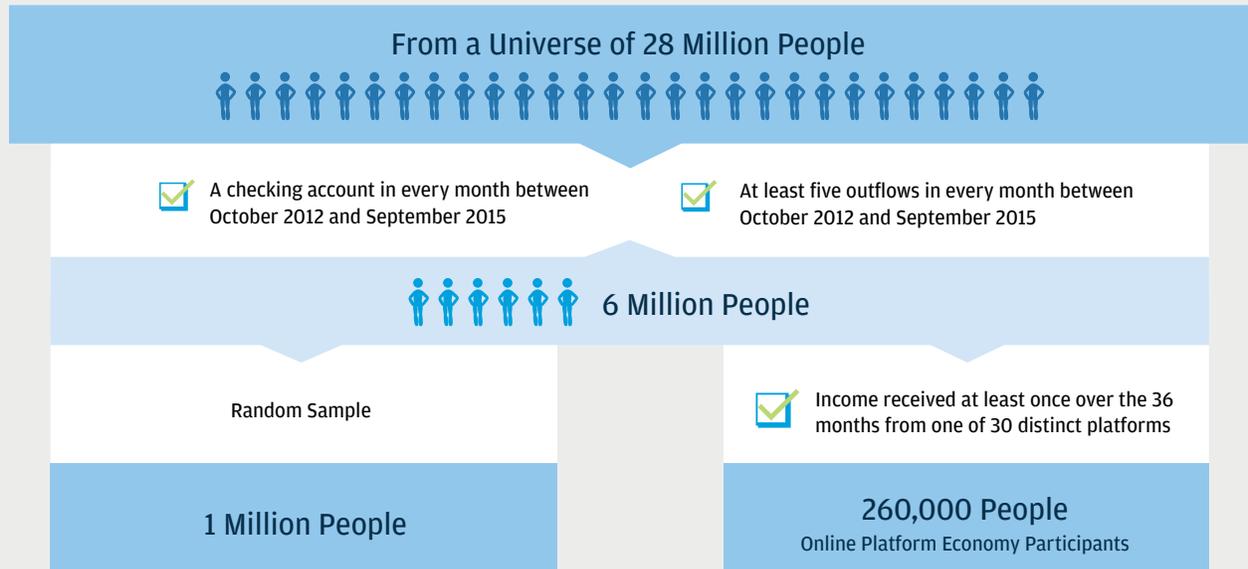
The Institute provides valuable insights to policymakers, businesses, and nonprofit leaders. But these insights cannot come at the expense of consumer privacy. We take precautions to ensure the confidence and security of our account holders' private information.

## Constructing our samples

For this report we used JPMorgan Chase data on consumer clients who are primary account holders. To avoid double counting of financial activity, all joint accounts were captured under one individual, the primary account holder. From a universe of 28 million checking account customers nationwide, we assembled an anonymized sample of "core customers." The sampling criteria for this report are twofold: First, individuals must have had a checking account for all 36 months between October 2012 and September 2015; and second, individuals must have had a minimum of five outflow transactions in every month.<sup>33</sup> From a total of 6.3 million individuals who met these criteria, we created two anonymized samples. For Part I of this report, we randomly selected an anonymized sample of 1 million individuals to investigate income volatility. For the purposes of analyzing volatility in labor income, we focused on a sub-population included in what we refer to as the "labor force." We defined the labor force as all individuals who received any labor income in the 36 months we studied. This represents roughly 74 percent of the sample. For Part II of this report, we studied over 260,000 individuals who received income from at least one of 30 distinct platforms over the three-year horizon in order to analyze the Online Platform Economy.

## Data

### Constructing our samples:



### Identifying income and jobs:



As shown in Figure 23 in Part II, our base sample of 1 million is different from the nation in important ways. First, our sample is skewed slightly in favor of prime-age individuals: It under-represents individuals aged 18–24 and over-weights individuals aged 25–54. Second, the Institute sample includes a high proportion of men. This bias may reflect a tendency for men to be listed as primary account holders on joint accounts rather than an underlying bias in the Chase population in favor of men. Third, our sample is biased geographically by Chase’s footprint, which gives us broad coverage of the four Census regions, but with a slight bias in favor of the West, when compared to Census population estimates. Finally, our sample is skewed in favor of higher-income individuals for a number of reasons. In our data asset, we observe only those individuals who have a relationship with Chase. Roughly 8 percent of Americans do not bank with a U.S. financial institution and tend to be disproportionately lower-income and non-Asian minorities (Federal Deposit Insurance Company, 2014).<sup>34</sup>

## Part I: Income Volatility

### Identifying income

In order to study income, we analyzed inflows into the checking accounts in our sample. On average, the individuals in our sample saw more than \$6,800 in inflows into their accounts each month, but not all money coming into an account can immediately be classified as income.<sup>35</sup> Through a number of techniques, we separated inflows into actual income versus transfers from other financial accounts owned by the individual. Specifically, we analyzed transaction descriptions to categorize transactions into, for example, labor income or Social Security income as distinct from transfers received from an external checking account. We categorized earnings from labor platforms as labor income and earnings from capital platforms as Other income. We also exploited the transaction channel by which the funds flow to categorize inflows when the transaction description is not available or informative. For example, we assumed that all ATM cash deposits represent income, and are categorized as Other income. Figure 32 shows the distribution of components of income for the full sample and by demographic group.

Figure 32: Components of income, by demographic group

	JPMorgan Chase Institute Sample					
	Labor	Other†	Social Security	Capital	Tax	Other government
1 million sample	71%	13%	7%	4%	4%	1%
18-24	74%	19%	1%	0%	5%	1%
25-34	80%	14%	1%	0%	4%	1%
35-44	79%	14%	1%	1%	4%	1%
45-54	78%	14%	2%	1%	3%	1%
55-65	69%	13%	7%	6%	3%	2%
65+	25%	9%	43%	18%	2%	3%
Women	68%	13%	9%	4%	4%	2%
Men	72%	13%	7%	4%	3%	1%
Midwest	73%	11%	8%	4%	3%	2%
Northeast	70%	15%	6%	4%	4%	1%
South	74%	10%	8%	4%	3%	2%
West	68%	16%	7%	4%	4%	2%
Income quintile 1*	33%	29%	23%	1%	11%	3%
Income quintile 2*	51%	16%	23%	2%	5%	2%
Income quintile 3*	65%	12%	12%	4%	4%	2%
Income quintile 4*	72%	11%	7%	5%	4%	2%
Income quintile 5*	78%	13%	2%	3%	3%	1%

\* Average monthly income is less than \$1,000 for Quintile 1, \$1,000 to \$1,900 for Quintile 2, \$1,900 to \$3,000 for Quintile 3, \$3,000 to \$4,800 for Quintile 4, and greater than \$4,800 for Quintile 5.

† Other income includes business point-of-sale revenue, ATM deposits, payments from other individuals, and refunds.

### Measures of income volatility

We examined volatility in take-home pay, the paychecks that arrive in an individual's bank account, which provided an important window into the liquidity and cash flow picture of U.S. individuals. Our primary measure of income volatility is the average absolute symmetric percent change in income on a month-to-month basis.<sup>36</sup> We also used a secondary measure of income volatility that provided a more stable reference point than the prior month—the average symmetric percent deviation between monthly income and the mean monthly income in the prior 12 months. We used this secondary measure for the purposes of describing positive versus negative fluctuations.

We identify distinct jobs within labor income by observing consistency in the transaction description of recurring labor income receipts that are directly deposited into individuals' checking accounts. As a result, we are able to identify months in which individuals remain in the same job or jobs, versus when they switch jobs or gain or lose a job. In doing so, we allow for gaps of up to three months between paychecks for a job to be considered continuous.

We studied volatility in income at four different levels, each of which provides a distinct perspective.

- **Total income:** This measure aggregates all inflows categorized as income in a month, to measure month-to-month changes in total income. For this measure, we used the entire 1 million person sample.
- **Labor income:** This measure aggregates all inflows categorized as labor income, including income from labor platforms. We calculated this measure only for individuals for whom we ever see any labor income over the three-year period, our proxy for whether someone is in the labor force. In some cases we studied the subset of individuals who are employed in consecutive months.
- **Job-level earnings:** This measure aggregates all paychecks received for a distinct job in a month, to measure month-to-month change in take-home pay for a single job. Rather than aggregating to the individual, this measure averages across all jobs, regardless of who holds them. We used this measure to study within-job volatility. This measure aggregates the impacts of variation in both paycheck amounts and the number of paychecks received (i.e., paycheck frequency effects). We estimated this measure for jobs that appear in consecutive months (allowing up to a three-month gap between paychecks).
- **Variation in paycheck amounts:** This measure calculates the change in paycheck amounts between consecutively received paychecks that pertain to a single job. We used this measure to study within-job volatility, and specifically to estimate the portion of volatility in job-level earnings that is due to variation in paycheck amounts as distinct from the number of paychecks received. As with job-level earnings, we estimated this measure for jobs that appear in consecutive months.

## Analyzing key drivers of volatility

We explored the extent to which volatility in take-home pay stems from positive versus negative fluctuations (Figure 9), job transitions versus within-job volatility (Figure 12 and Figure 19), and variation in paycheck amounts versus paycheck frequencies (Figure 14 and Figure 16). Throughout these analyses we assessed both the frequency of occurrence and the absolute value of the change in income when these events occur. We described the methodology for each of these in turn.

- **Size and frequency of monthly spikes and dips in income** (Figure 9): We assessed spikes (positive fluctuations) and dips (negative fluctuations) in income compared to the mean income over the prior 12 months. We used this measure rather than month-to-month symmetric percent change in order to provide a longer-term reference point than the prior month. We assessed frequency of occurrence on a person-month basis by estimating the percentage of person-months in which individuals experience greater than a 5 percent (positive or negative) deviation from the mean income in the prior 12 months as well as no deviation (less than 5 percent). We then assessed the mean magnitude of the deviation in the person-months with dips, spikes, or no deviations. This analysis includes all individuals in the labor force (those for whom we observe any labor income over the course of the three years).
- **Job transitions versus within-job volatility** (Figure 12, Figure 19, and Figure 20): We ascertained the frequency of job transitions over two time frames: on a month-to-month basis over the course of the 36 months in our sample (Figure 12) and over the course of three 12-month periods from October 2012 to September 2015 (Figure 19). We estimated the absolute dollar value impact of each job transition by calculating the mean change in labor income for median individuals in the month in which the job transition occurs (Figure 20). In order to estimate the percentage of month-to-month volatility that stems from people staying within the same job versus experiencing a job transition, we multiplied the frequency of occurrence (e.g., 77 percent stay in the same job on a month-to-month basis) by the mean dollar value of the impact (e.g., \$1,266 absolute month-to-month change) to estimate the expected dollar value of a job transition. The contribution to month-to-month volatility of each job transition is then estimated as the ratio of this expected dollar value to the total month-to-month change. This analysis includes all individuals in the labor force (those for whom we observe any labor income over the course of the three years).

Figure 33: Contribution of job transitions to month-to-month percent change in labor income

	Occurrence over the course of one year	Occurrence on a month-to-month basis	Median absolute change in monthly income	Mean absolute change in monthly income	Expected value	Contribution to month-to-month volatility
Stay in the same job(s)*	53%	77%	\$590	\$1,266	\$973	86%
Remain unemployed†	9%	17%	\$0	\$0	\$0	0%
Gain or lose a job(s)‡	35%	6%	\$1,108	\$2,451	\$140	12%
Switch job(s)‡	7%	1%	\$830	\$1,931	\$13	1%
<b>Total</b>		100%			\$1,126	100%

\* Temporary gaps in pay of up to 3 months within the same job are counted as staying in the same job.

† Individuals without direct deposit may appear as not employed.

‡ These two job transitions are not mutually exclusive over the course of one year and may reflect changes in enrollment in direct deposit of payroll into a Chase account or change in job status of a secondary account holder. In addition, the absolute change in monthly labor income as a result of a job switch reflects not only changes in wages, but also end-of-job reimbursements (cashing out on vacation) as well as time taken off between jobs.

- Paycheck amounts versus paycheck frequencies** (Figure 14 and Figure 16): For this analysis we estimated the percentage of people who experience each phenomenon. Since this is an investigation of the sources of within-job volatility in pay, we focused on only individuals who have been employed in consecutive months. We first estimated the percentage of within-job pay volatility that is due to variation in paycheck amounts versus paycheck frequencies. To do so, we calculated how much month-to-month change in monthly earnings for all jobs held for at least two consecutive months (30 percent) reduces when we calculate the average percent change in paycheck amounts for all jobs, regardless of the amount of time that elapses between them (22 percent). We ascertained that variation in paycheck amounts accounts for 72 percent of the volatility in total earnings (22 percent as a fraction of 30 percent), and the remaining 28 percent of volatility in monthly earnings is due to pay frequency effects.

To analyze directly the impacts of pay frequencies, we estimated the pay frequency of individual jobs. To do so, we analyzed the average number of paychecks received per month in all months in which a job appears. Our assumptions for each pay frequency can be found in Figure 34. In designating pay frequency, we allowed individuals who are paid monthly or more frequently to see a gap in payment for up to one month.

Figure 34: Assumptions used to infer pay frequency of jobs

Pay Frequency	Assumption
Less than monthly	Less than one paycheck in the average month
Monthly	Exactly one paycheck in the average month or between one and two paychecks in the average month
Twice a month	Exactly two paychecks in the average month
Every two weeks	Between two and three paychecks in the average month
Weekly	At least three paychecks in the average month

Next we estimated the frequency of occurrence and absolute change in earnings generated by distinct sources of variation in paycheck amounts and the five-Friday paycheck frequency effect. To estimate the dollar impact of end-of-year pay spikes in December through March versus the five-Friday effect, we regressed income at the person-month level on indicator variables for December through March months, five-Friday months, individuals paid bi-weekly, individuals paid weekly, and interaction effects

between Five-Friday months and individuals paid every two weeks or weekly. As described in Figure 35, we used the coefficients from this regression to estimate the absolute change in labor income for December to March pay spikes, the three-paycheck month effect for those paid every two weeks, and the five-paycheck month effect for those paid weekly. To estimate the dollar magnitude of idiosyncratic changes in paycheck amounts, we calculated the conditional mean absolute change in income among all person-months between April and November, excluding five-Friday months for individuals paid every two weeks or weekly. We then divided these estimates by the mean monthly labor income (\$3,029) to obtain the percent change in labor income associated with each phenomenon displayed in Figures 14 and 16.

**Figure 35: Approach to estimating impacts of variation in paycheck amounts and paycheck frequency**

	Percentage of people who experience this	Approach to estimating percentage of people affected	Absolute mean change in labor income in the month(s) when this occurs	Approach to estimating absolute change in labor income
December to March pay spikes (>5% increase)	61%	Percentage of people who experience a pay increase larger than 5% in December-March, excluding five-Friday months*	30% (\$911)	Regression: Mean impact across December-March months (\$228) × 4 possible months over which bonus effect is spread, controlling for impact of five-Friday on bi-weekly and weekly paid people
Other spikes or dips (>5% change)	61%	Percentage of people who experience a pay increase larger than 5% in April-November, excluding five-Friday months for individuals paid every two weeks or on a weekly basis†	27% (\$806)	Conditional mean absolute change in income among individuals who see > 5% change in income between April-November excluding five-Friday months for individuals paid on a bi-weekly or weekly basis
Three-Paycheck month effect (paid bi-weekly)	55%	Percentage of people who hold a job that pays on a bi-weekly basis	26% (\$802)	Regression: Mean impact of five-Friday (\$83) + mean impact of five-Friday for individuals paid bi-weekly (\$359) × 2 possible pay groups over which five-Friday effect is spread, controlling for December-March effect
Five-paycheck month effect (paid weekly)	25%	Percentage of people who hold a job that pays on a weekly basis	14% (\$418)	Regression: Mean impact of five-Friday (\$83) + mean impact of five-Friday for individuals paid weekly (\$335), controlling for December-March effect

\* These months include January and February in 2013, March and December in 2014, and March of 2015.

† For people who are not paid every two weeks or weekly, these months include May through November in 2013 and 2014, and May through September 2015 for people who are not paid either weekly or every two weeks. For people who are paid every two weeks or weekly, these months include June, July, September, and October in 2013 and July, August, and September in 2014.

## Part II: Identifying Earnings from the Online Platform Economy

We identified participants in the Online Platform Economy within a total population of 6.3 million core customers by further analyzing transaction descriptions of inflows into checking account customers. We identified transactions flowing into accounts from 30 different platforms, for which the company name was clearly identifiable in the transaction description. Although we required the monetary transaction between the buyer and the seller to have been facilitated by the platform, we allowed for a variety of different payment intermediaries. We excluded inflow transactions that were refunds to customers and payments to likely full-time employees of each company.

Our estimates of the size of the platform economy may be biased downward because we only examined 30 platforms, and we may not see all transactions for each platform. On the other hand, our estimates could be biased upward to the extent that our sample reflects a population that is more likely to participate in the platform economy, in that they have a bank account at all, or are more likely to be men or live in the West. Our estimate of cumulative participation rate in the platform economy is most likely a lower bound by virtue of the fact it is constrained by the three-year horizon. Notwithstanding these potential biases, our market size estimates are in line with several other recently released estimates as shown in Figure 36.

**Figure 36: Comparison of JPMorgan Chase Institute Online Platform Economy market sizing to recent benchmarks**

Type of Estimate	Type of Platform*	Study	Time Frame	Published Estimate	Estimate as a Percentage of Adults	JPMC Institute Comparable Estimate
Monthly Participation Rate	Labor	McKinsey Global Institute (2015)	As of June 2015	< 1.0% of working age population <sup>2</sup>	< 0.8%	0.4% (September 2015)
		Harris and Krueger (2015)	Fall 2015	0.4% to 1.3% of total employment	0.2%-0.8%	
Cumulative Participation Rate	Labor and Capital	Steinmetz (2016)	N/A	22% of adults with access to the internet <sup>3</sup>	18%	4.0% (October 2012-September 2015)

\* The studies in this table are limited to estimates of the Online Platform Economy as defined in this report. Others have estimated the size of the overall contingent workforce, which consists of both online and offline work. For example, the U.S. Government Accountability Office (GAO) estimates that 40 percent of the employed population in 2010 (24 percent of adults) was engaged in contingent work, though this incorporates a broader definition of contingent work than other estimates (GAO, 2015). Freelancers Union and Upwork estimate that 53.7 million people in 2015 (22 percent of adults) had freelanced in the last year (Freelancers Union and Upwork, 2015). This estimate also includes a broad definition of freelancing. Dourado and Koopman (2015) report that there were 91 million 1099-MISC forms issued by the IRS in 2014 to qualifying individuals receiving income outside of the traditional employment relationship. Individuals performing independent work for multiple employers receive a 1099-MISC form for each employer.

† Individuals aged 15-64.

‡ 84 percent of U.S. adults used the internet in 2015 (Perrin and Duggan, 2015).

The share of total income coming from Online Platform Economy earnings could be biased upward to the extent that non-platform income is undercounted, whereas platform income flows entirely through electronic transfers, which were more readily categorized. As mentioned above, 38 percent of inflow dollars were uncategorized in that they are deposited paper checks or other unidentifiable incoming transfers.

# Endnotes

- 1 Recent evidence from the U.S. Financial Diaries indicates that household income deviates by more than 25 percent from the household's average monthly income in five months out of the year (Hannagan and Morduch, 2015). Dynan et al. (2012), using the Panel Study of Income Dynamics, found that the percentage of people experiencing a 25 percent or more decline in income over a two-year period increased from 16 percent in the early 1970s to over 20 percent in the 2000s. Gottschalk and Moffitt (2009) document the rise in transitory changes or earnings instability between the 1970s and the 1990s. Hardy and Ziliak (2014) found that volatility of family income more than doubled between 1980 and 2009.
- 2 We describe our sampling criteria, sample attributes, and methodology in more detail in the Data and Methodology section. Among our sample, 53 percent of primary account holders are individual account holders, and the activity we see for these individuals likely reflects the financial lives of individual persons. This activity may offer a partial view of their financial lives if, in addition to having their own account, they are also secondary account holders on distinct joint accounts. The other 47 percent of our sample have multiple authorized users and likely reflect the financial lives of families.
- 3 In each case here and throughout much of this report, we have calculated the symmetric percent change between A and B, calculated as  $(B-A)/(0.5 \times (A+B))$ . This formula has the benefit of allowing for positive and negative changes to be represented symmetrically and also for changes from zero to be calculable.
- 4 We present demographic differences by age, income level, and geography. We also examined gender differences and found that men experienced slightly more volatility on average than women. However, after controlling for age, income, and region this effect did not remain significant.
- 5 Others have documented that young people have lower attachment to the labor force and more job transitions (Topel and Ward, 1992), and that transitory shocks in income are more frequent among young people (Gunderson and Ziliak, 2008).
- 6 Hardy and Ziliak (2014) find similar results that income volatility is highest in the top one percent of the income distribution, but that in any given year the level of volatility among the bottom 10 percent exceeds that of the top.
- 7 For a breakdown of the composition of income by demographic group, see Figure 32 in the Data and Methodology section.
- 8 It is worth noting that labor income volatility (Figure 7) was comparable to total income volatility (Figure 1) on an annual basis, but labor income was significantly less volatile than total income on a month-to-month basis.
- 9 Non-zero values have been winsorized at the 99.99th percentile to minimize the influence of outliers, in that values above the 99.99th percentile of non-zero values have been truncated to the 99.99th percentile level. Results do not change significantly without winsorization. Without winsorization, 4 percent of individuals experienced monthly changes in income of less than 5 percent, 73 percent experienced monthly changes of 5 to 30 percent, and 22 percent experienced monthly changes of greater than 30 percent.
- 10 These increases and decreases are expressed in symmetric percent changes. This result is consistent with Gorbachev (2016), who finds that labor earnings of spouses are increasingly correlated, and that it is primarily through non-labor components of income that families mitigate volatility in total income. Hardy and Ziliak (2014) also find a negative covariance between the labor and non-labor components of income.
- 11 Temporary gaps in pay of up to three months within the same job were counted as staying in the same job. These monthly job transition rates were comparable to those estimated from the 2008 panel of the Survey of Income and Program Participation (SIPP). Using the SIPP, we calculated that 77 percent of individuals stay in the same job from one month to the next, 3 percent gain or lose a job, 2 percent switch jobs, and 18 percent remain not employed.
- 12 See the Data and Methodology section and Figure 33 for an explanation of this calculation.
- 13 End-of-year changes in take-home pay could also reflect changes in benefit status or employer deductions that often take effect at the beginning of the calendar year.
- 14 The Bureau of Labor Statistics estimates that roughly 60 percent of workers in the United States are paid hourly (U.S. Bureau of Labor Statistics, 2015).

- 15 Volatility in paycheck amounts is most extreme among jobs that pay on a less than monthly or on a weekly basis. Thirty-two percent of weekly paid jobs exhibited more than a 30 percent change in paycheck amounts on a month-to-month basis. Jobs that pay weekly are most prevalent in the construction, manufacturing, and natural resources and mining sectors, and also tend to be the lowest paying jobs (Burgess, 2014). Undoubtedly, jobs that pay weekly are less likely to be salaried jobs, and, rather, pay by the hour. Volatility in paycheck amounts among weekly paid jobs could therefore be driven by variation in hours worked. Volatility in paycheck amounts was also very high among jobs that pay on a monthly or less than monthly basis, which could reflect other non-salaried pay arrangements, such as fixed-contract or commission-based work.
- 16 A closer inspection of labor income inflows by day reveals peaks on the Friday before March 15 and on March 15 in each of the three years.
- 17 Using the 2014 Consumer Expenditure Survey, the following categories represent 38 percent of total consumption: shelter, vehicle finance charges, vehicle insurance, health insurance, personal insurance, and pensions.
- 18 Note that roughly 10 percent of individuals in our sample hold multiple jobs. See the Data and Methodology section for a more in-depth description of the methodology used to estimate pay frequencies. It is important to note that state governments regulate pay frequency. Most state governments require employees to be paid at least monthly, but minimum pay frequencies can also vary by industry or the type of job. For example, 15 states require employers to pay weekly or every two weeks for jobs in certain occupations or that pay an hourly wage rather than an annual salary (U.S. Department of Labor, 2015).
- 19 These results regarding the frequency of pay are comparable to recent statistics reported by the Bureau of Labor Statistics based on the Current Employment Statistics survey in March 2013 (Burgess, 2014), which indicate that among private sector employers that pay on a single pay frequency (95 percent of private sector employers), 32 percent pay weekly, 37 percent pay every two weeks, 20 percent pay semimonthly and 11 percent pay monthly. Although both this study and the Department of Labor find bi-weekly and weekly to be the most common pay frequency, differences in estimates may occur because this report captures workers in all sectors, not just private sector employers. The U.S. federal government and many state and local governments pay every two weeks, which could potentially account for the higher prevalence of individuals with jobs that pay every two weeks in JPMC Institute data.
- 20 These annual estimates are comparable to the 2008 SIPP panel, which runs from 2008 through 2013. In this survey, over the course of one year, 57 percent of individuals stay in the same job, 28 percent gain or lose a job, 10 percent switch jobs, and 7 percent remain unemployed. In summary, 36 percent of individuals experience some kind of job change over the course of the year. We might observe a higher degree of turnover as a result of individuals switching direct deposit status into their Chase checking account.
- 21 Our definition excludes platforms that might be considered part of the so-called “on-demand” or “sharing” economy but that facilitate the exchange of goods or services for free (e.g., Couchsurfing), do not serve as a financial intermediary of any kind in the transaction (e.g., Craigslist), or do not rely primarily on contingent or independently provided labor or capital (e.g., FreshDirect).
- 22 Recent industry reports indicate that Online Platform Economy workers vary their hours considerably. In any given week, 65 percent of Uber driver-partners change the number of hours by more than 25 percent (Hall and Krueger, 2015). A 2015 survey of 1,000 on-demand drivers found that 75 percent changed the number of hours they are driving, with 35 percent working more hours and 41 percent working fewer hours (SherpaShare, 2015).
- 23 In fact, not only are sellers paid on a piece-rate basis, but the unit price of a good or service can vary dramatically. For example, many transportation or delivery platforms increase prices when demand peaks.
- 24 Our definition of labor platforms is consistent with the definition asserted by Harris and Krueger (2015) and McKinsey Global Institute (2015), which describes the “online gig economy” as an online marketplace for contingent work in which online platforms facilitate the sale of “personal tasks” such as driving a passenger from A to B. Examples are listed to illustrate the definition of labor versus capital platforms and do not imply that we have identified income from these specific platforms.
- 25 The Contingent Worker Survey estimates that as of 2005, roughly 30 percent of individuals are in a contingent work arrangement, self-employed, or working independently (Dokko et al., 2015). The U.S. Government Accountability Office (GAO) estimates that the percentage of individuals in alternative work arrangement has increased from 35 percent in 2006 to 40 percent in 2010 (GAO, 2015). Others note that the number of people filing tax returns as independent workers (1099 forms) or reporting profits from home businesses (Schedule C) rose in the 2000s as evidence of an increase in independent workers (Dokko et al., 2015). The U.S. Department of Labor recently announced plans to rerun the Contingent Worker Supplement in May 2017 (Perez, 2016).

- 26 Our participation rate estimates may be biased downward because we identified income from only 30 distinct platforms, which is not the full universe of platforms. In addition, we may not be able to identify all income from each platform. On the other hand, our estimates may be biased upward if participants in the Online Platform Economy are more likely to have a bank account to begin with, or other platform screening criteria or participation biases align with biases that exist in our sample. See the Data and Methodology section for a comparison of our market size estimates with other recent estimates.
- 27 Estimates do not sum to 100 percent because of rounding.
- 28 Our estimates of the percentage of participants who used multiple platforms may be biased downward as a result of the fact that we identified earnings from only 30 platforms.
- 29 Median monthly earnings are very similar to the means. Median monthly earnings are \$537 for labor platform participants (34 percent of total income for the median participant) and \$308 for capital platform participants (20 percent of total income for the median participant).
- 30 Mishel (2015) comes to a similar conclusion based on estimates from Freelancers Union and Upwork (2015) and trends in Bureau of Labor Statistics estimates of self-employment.
- 31 This level of reliance is roughly on par with a recent industry survey of 1,000 on-demand workers, in which 29 percent report that their work as an independent contractor represents more than 75 percent of their household income (Roose, 2015).
- 32 In Figure 26 we estimated that labor platform income accounts for 33 percent of total income in the average month for labor participants. That estimate is calculated by averaging platform earnings as a percentage of total income at the individual level across all individuals. Here, we estimated that average monthly earnings from labor platforms (\$533) accounts for 15 percent of average total income (\$3,639) in aggregate in months with platform earnings. The discrepancy exists between the individual-level estimate (33 percent) and the aggregate-level estimate (15 percent) because of the wide distribution of non-platform income that exists among platform participations. The same methodology is used for the capital platform estimates.
- 33 In our report *Weathering Volatility*, we required everyone to have a Chase checking account and a Chase credit card for the 27 months that we were examining. Additionally we required individuals to have five outflow transactions and \$500 in deposits every month. The different selection criteria provided us with greater heterogeneity in our sample, while preserving a focus on core customers for whom we have visibility into the majority of their financial life.
- 34 In addition, 47 percent of our accounts have more than one individual on them. Median monthly family income for the U.S. according to the 2014 Current Population Survey was \$3,566. Our estimated income of \$2,837 is significantly lower than this figure in part because 38 percent of inflows remain uncategorized.
- 35 In this sample we categorized 62 percent of inflows, including 41 percent categorized as income and 21 percent categorized as transfers. The remaining 38 percent remained uncategorized.
- 36 The symmetric percentage change between A and B is calculated as  $(B-A)/(0.5 \times (A+B))$ . This formula has the benefit of allowing positive and negative changes to be represented symmetrically and also for changes from zero to be calculable.

The Online Platform Economy presents a better option to weather volatility, if the alternatives are to constrain spending or take on debt.

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