A GLOBAL THINK TANK DEDICATED TO DELIVERING DATA-RICH ANALYSES AND EXPERT INSIGHTS FOR THE PUBLIC GOOD

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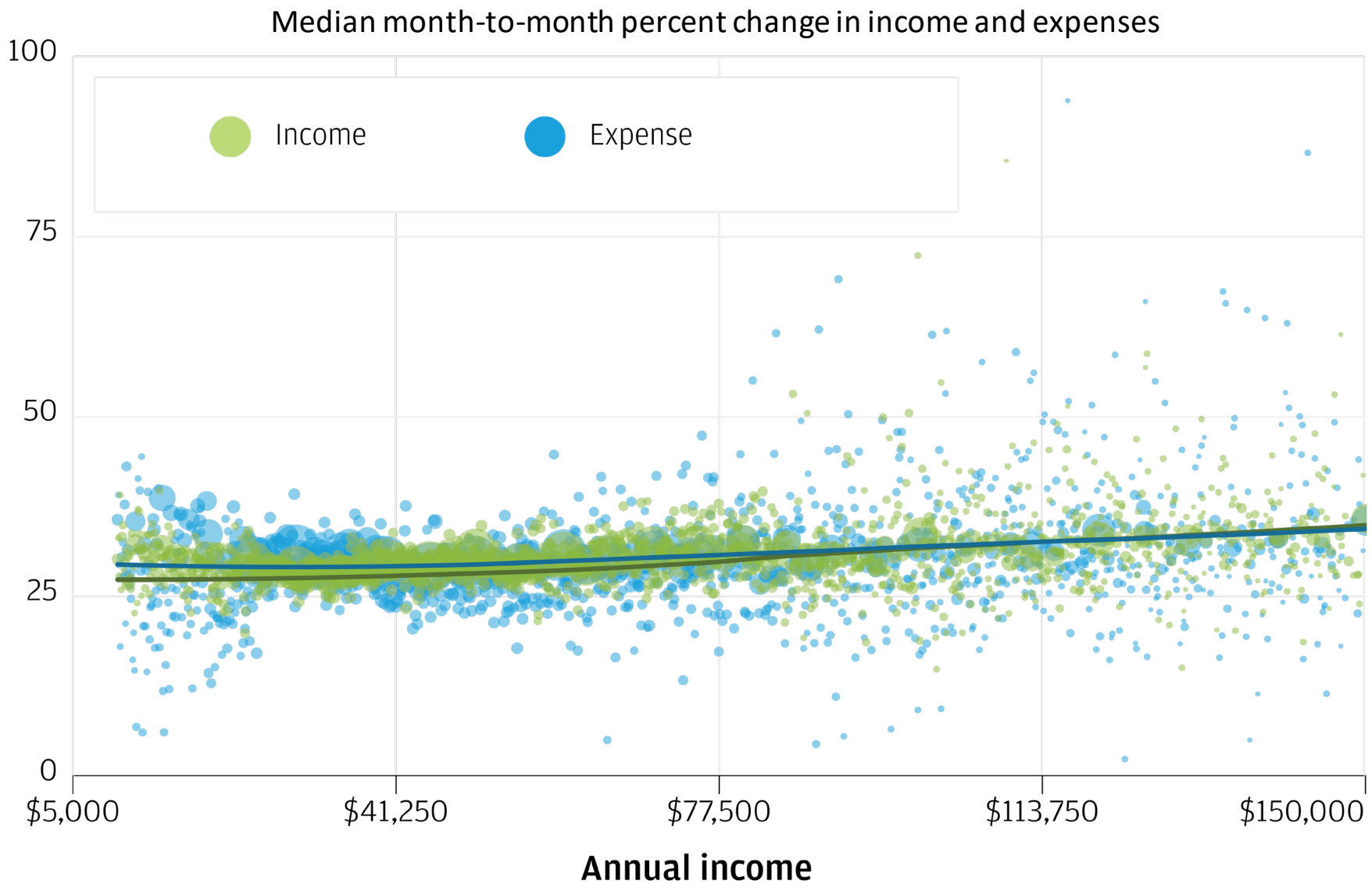
Volatility has been a core theme of our work since the launch of the Institute 4 years ago.

Families experience high income and spending volatility on a month-to-month basis.



Source: JPMorgan Chase Institute

Key questions for current research

1. To what extent does income volatility **change over time**?

2. How does income volatility manifest itself in terms of **spikes and dips**?

3. How does **spending volatility** compare to income volatility?

4. How much of a **cash buffer** do families need to weather income and spending volatility?

We assembled a data asset of 6 million checking account customers we observe continuously for over 6 years (Oct 2012 – Dec 2018).

FROM THE ENTIRE UNIVERSE OF NEARLY 40 MILLION CHASE DEPOSIT CUSTOMERS

SIX MILLION **ANONYMIZED FAMILIES**

form a 75-month balanced panel (October 2012 to December 2018)

Our unit of analysis is the primary account holder, which we refer to as a "family."
To be included in our sample, an account holder must have:

1

At least **five transactions** (inflows or outflows) from a personal checking account in every month between October 2012 and December 2018.

This attempts to ensure the Chase account observed is the account holder's active bank account.

2

At least **$400 in average monthly total income** for every twelve-month rolling period.

This serves to filter for account holders whose income is likely landing at the Chase account observed.

3

At least **$10 in average spending**, and at least $1 spent every month.

This attempts to ensure we see spending activity for a given account.

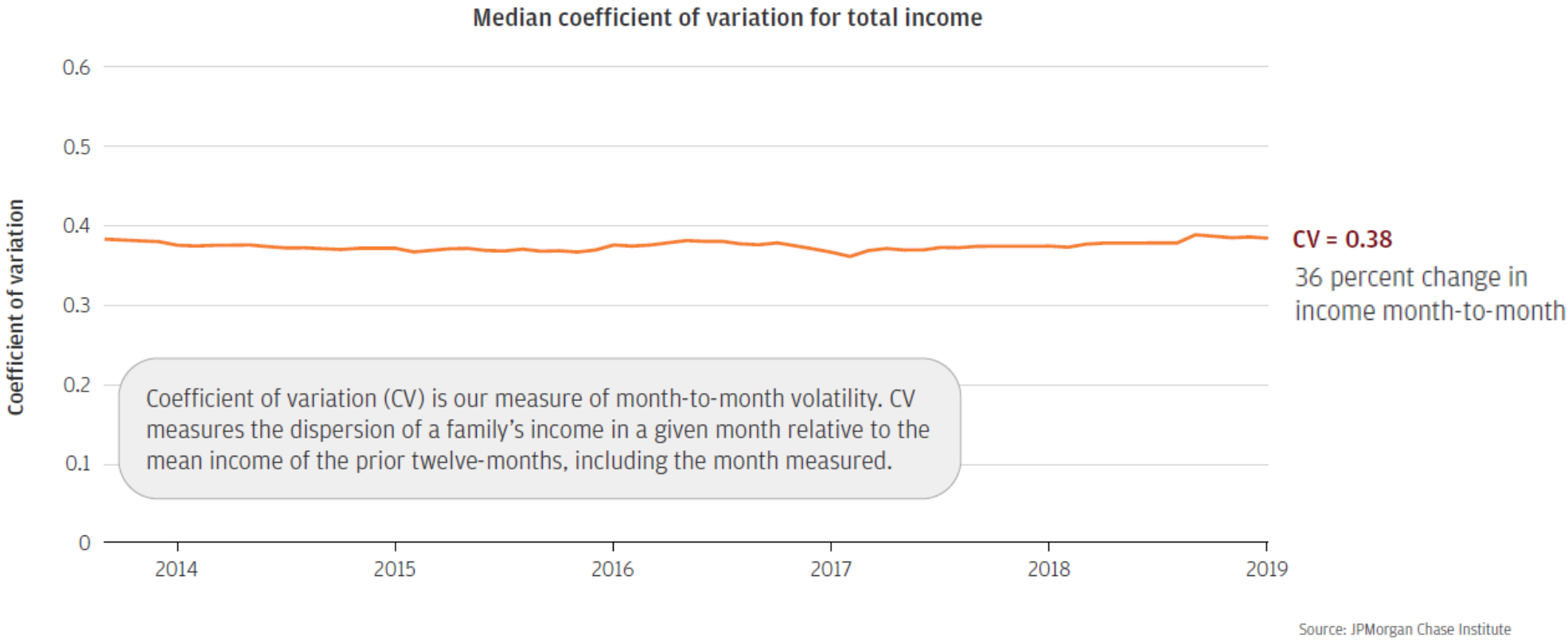
Incomes we observe are take-home incomes, meaning after taxes and payroll deductions. Income categories we construct in our data set include labor income (i.e. payroll and other direct deposits) and non-labor income (i.e. government income, capital income, and otherwise).

Income volatility remained constant between 2013 and 2018. Those with the median level of volatility experienced a 36% change in income month-to-month.

For each account-month, we calculate the Coefficient of Variation (CV) for a stable 75-month cohort as:

$$Coefficent\ of\ Variation_{i,m,j} = \frac{SD(Y_{i,m-11,j},\ Y_{i,m-10,j}\ ,\ldots,Y_{i,m,j})}{AVG(Y_{i,m-11,j},\ Y_{i,m-10,j}\ ,\ldots,Y_{i,m,j})}\ ;$$

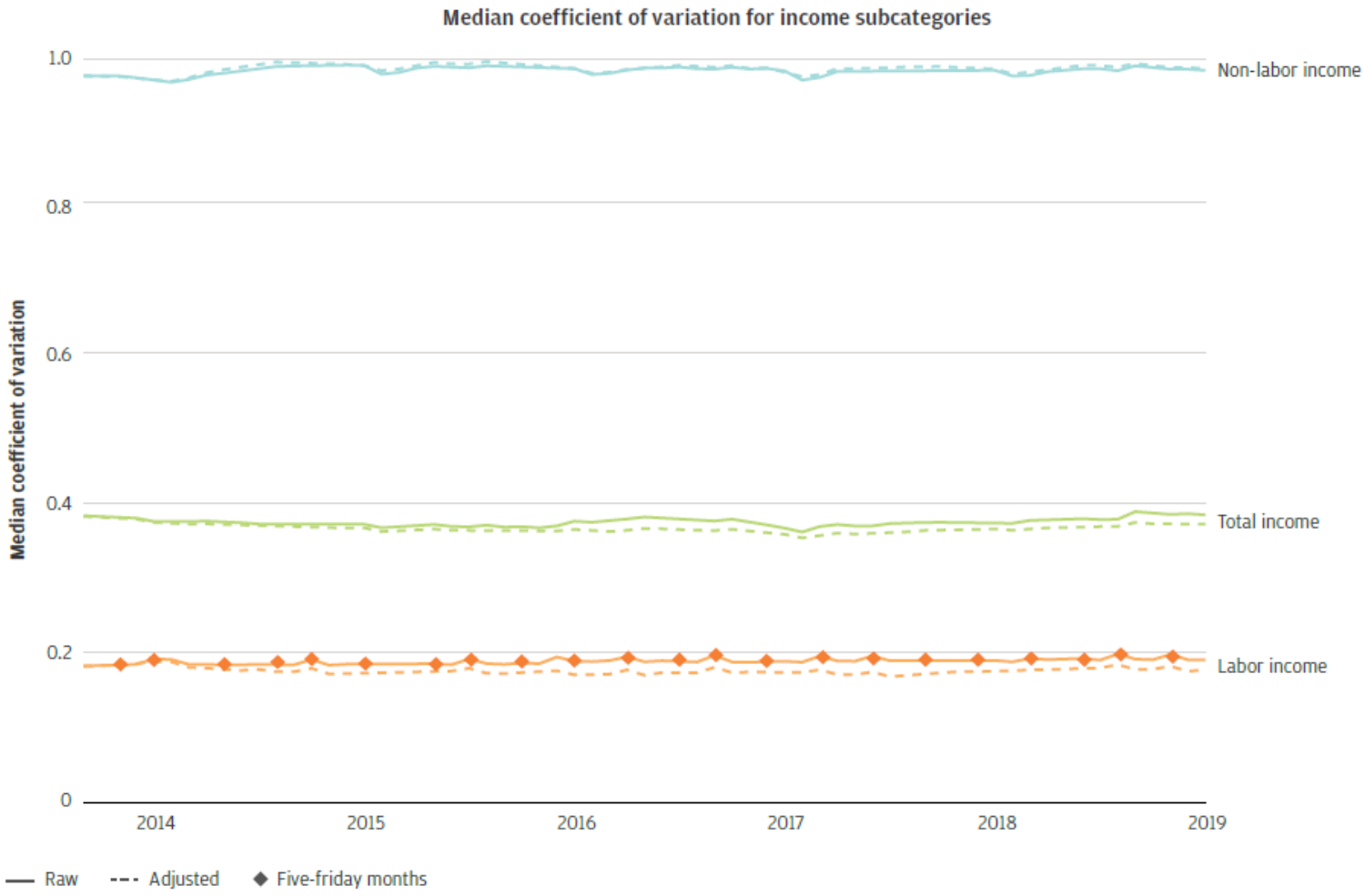
Y = monthly income, i = individual family, m = month, j = income category



Source: JPMorgan Chase Institute

1. To what extent does income volatility **change over time**?

Non-labor income is 5X more volatile than labor income but represents just 35% of total income. Secular growth and calendar effects account for little volatility.

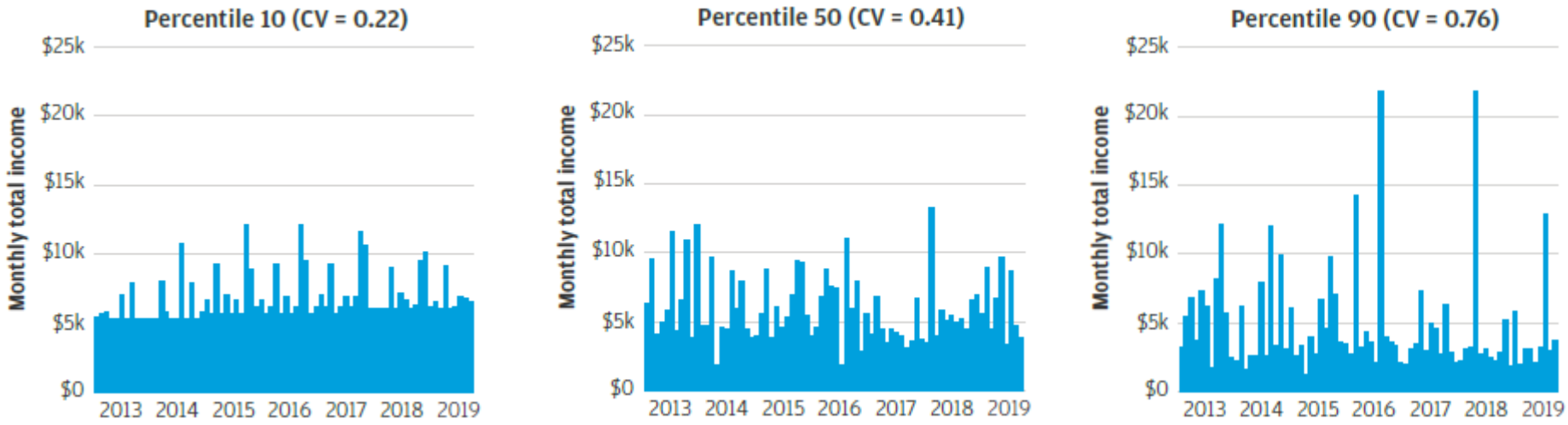


Note: For the adjusted series, we adjust for secular income trends and month-to-month calendar effects by running fixed effect regressions with month-year dummies among families within similar income bands.

Source: JPMorgan Chase Institute

There is wide variation in the levels of income volatility families experience, both across families and also for a given family over time.

Illustrative monthly income patterns for families at different points of the volatility distribution



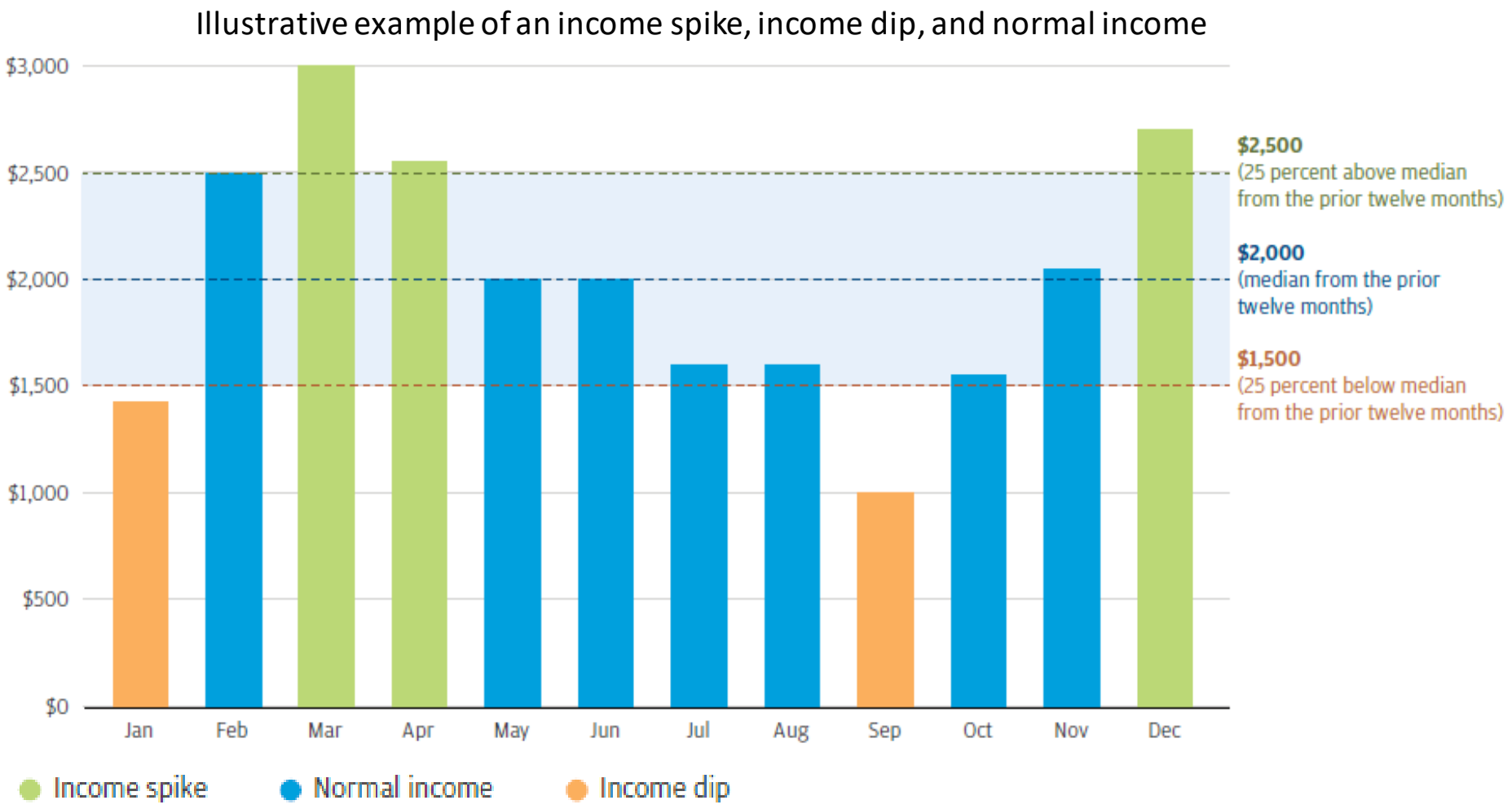
Probability of staying in the same quintile year-on-year

Notes: (1) For each hypothetical income pattern we show, we do not reflect actual account holders' cash flow patterns. We multiply each family's monthly incomes by a random scaler between 0 and 1 that is undisclosed. (2) Coefficient of Variation (CV) thresholds shown in Figure 7 are calculated as the average of yearly CV at the individual level. In prior charts, including Figure 6, CVs are measured at the family-month level.

Source: JPMorgan Chase Institute

Families experience large income swings in almost five months out of the year.

Income spikes and dips are swings that are more than 25% above or below the prior year median.

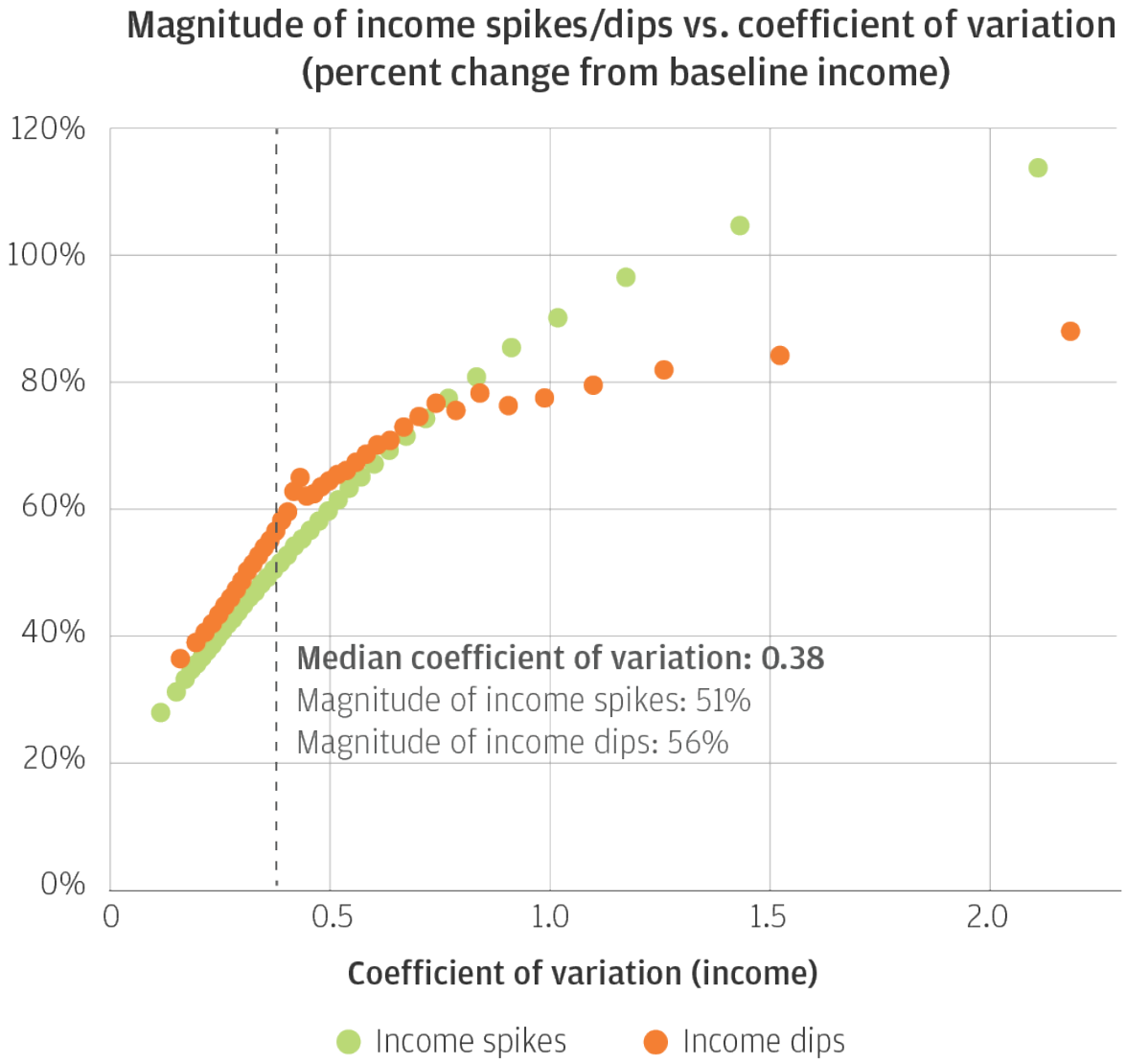


2. How does income volatility manifest itself in terms of **spikes and dips**?

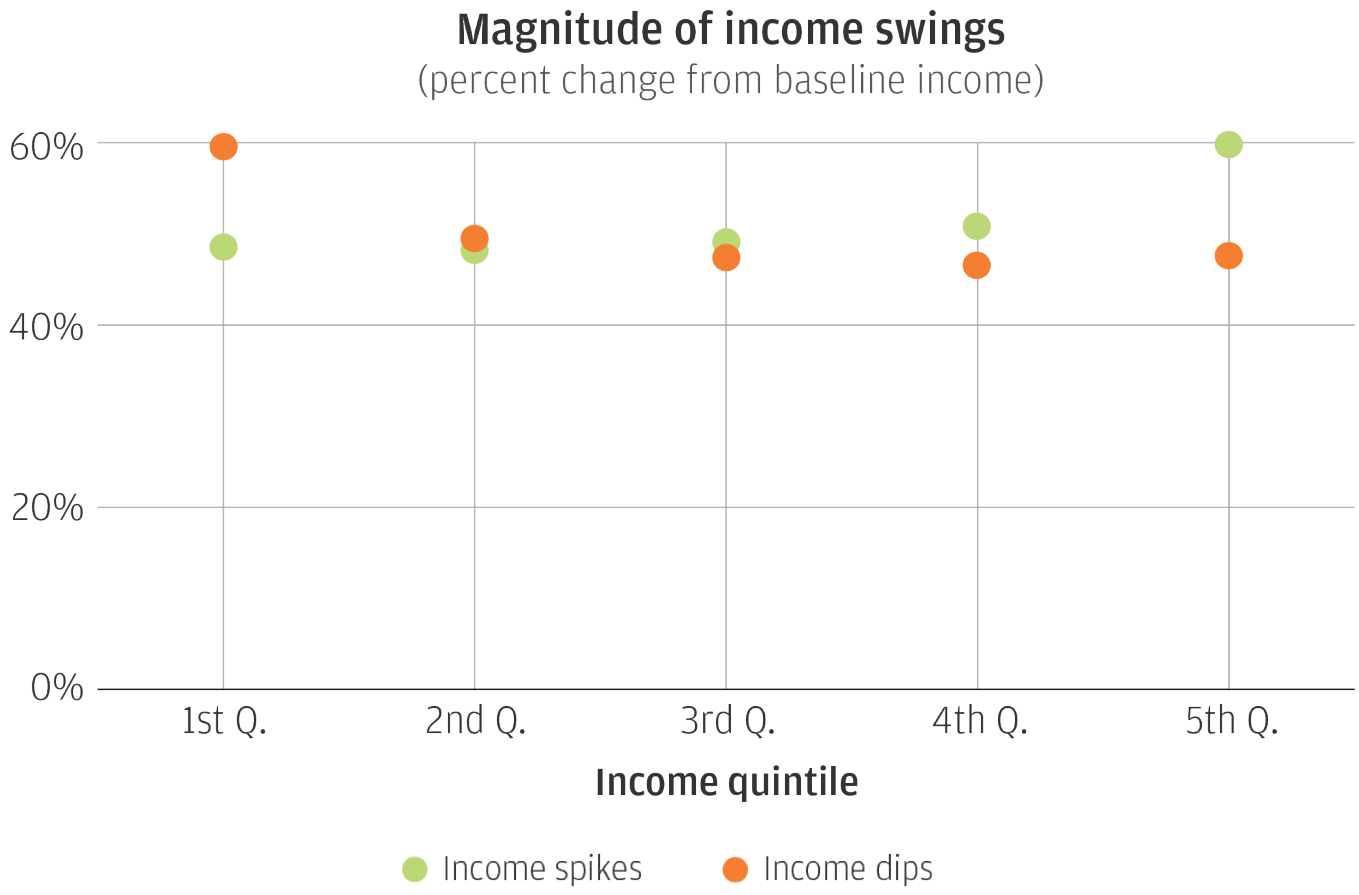
Income spikes are twice as likely as income dips and most common in March and December.

2. How does income volatility manifest itself in terms of **spikes and dips**?

Families with the most volatile incomes experience swings that are larger but not more frequent than families with less volatile incomes.



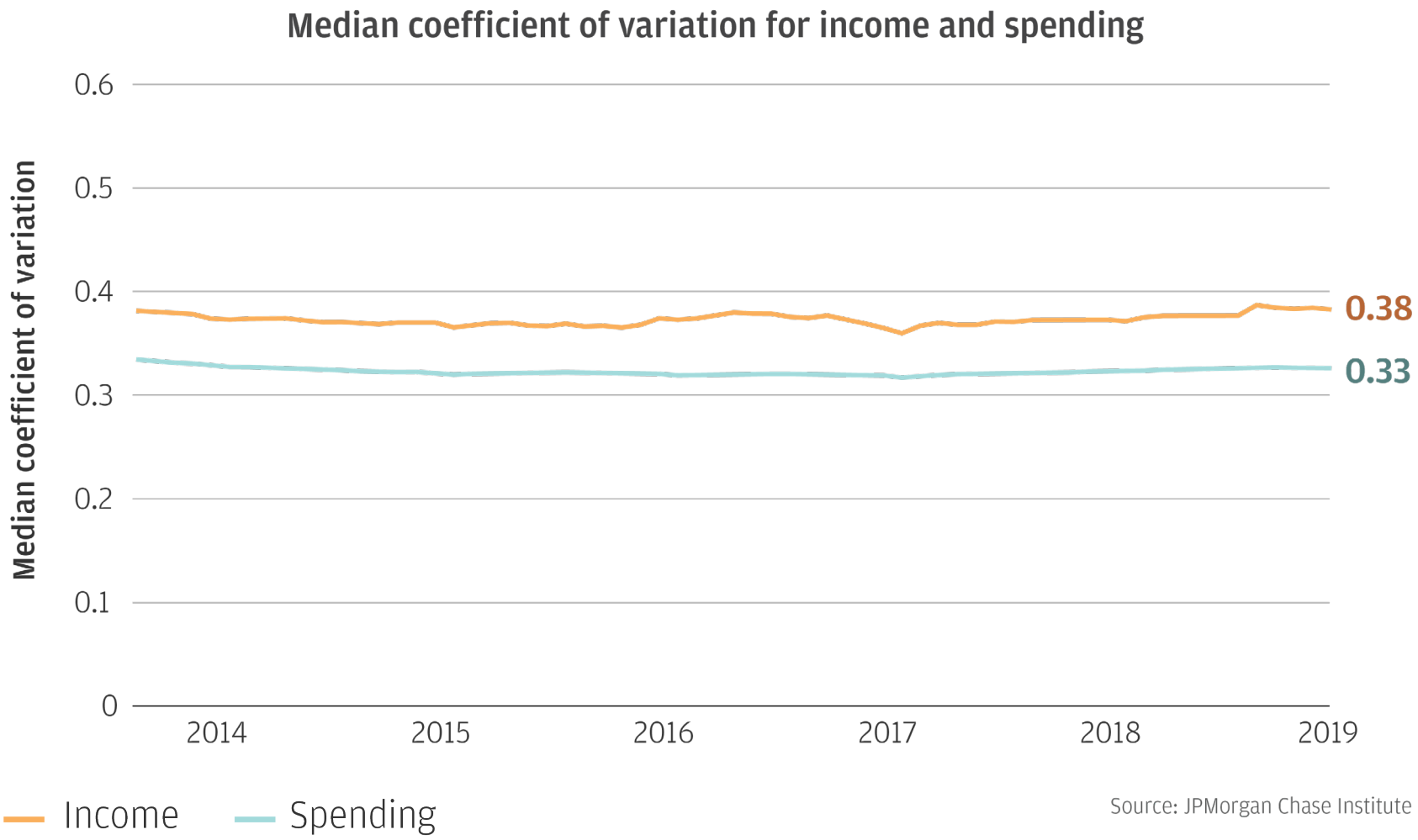
Income volatility is greatest amongst the young and the high income. However, downside risks, in terms of the magnitude of dips, are greatest among low-income families.



Note: Income quintile ranges: Quintile 1: < $29K, Quintile 2: $29K-$43K, Quintile 3: $43K-$61K, Quintile 4: $61K-$95K, Quintile 5: >$95K.

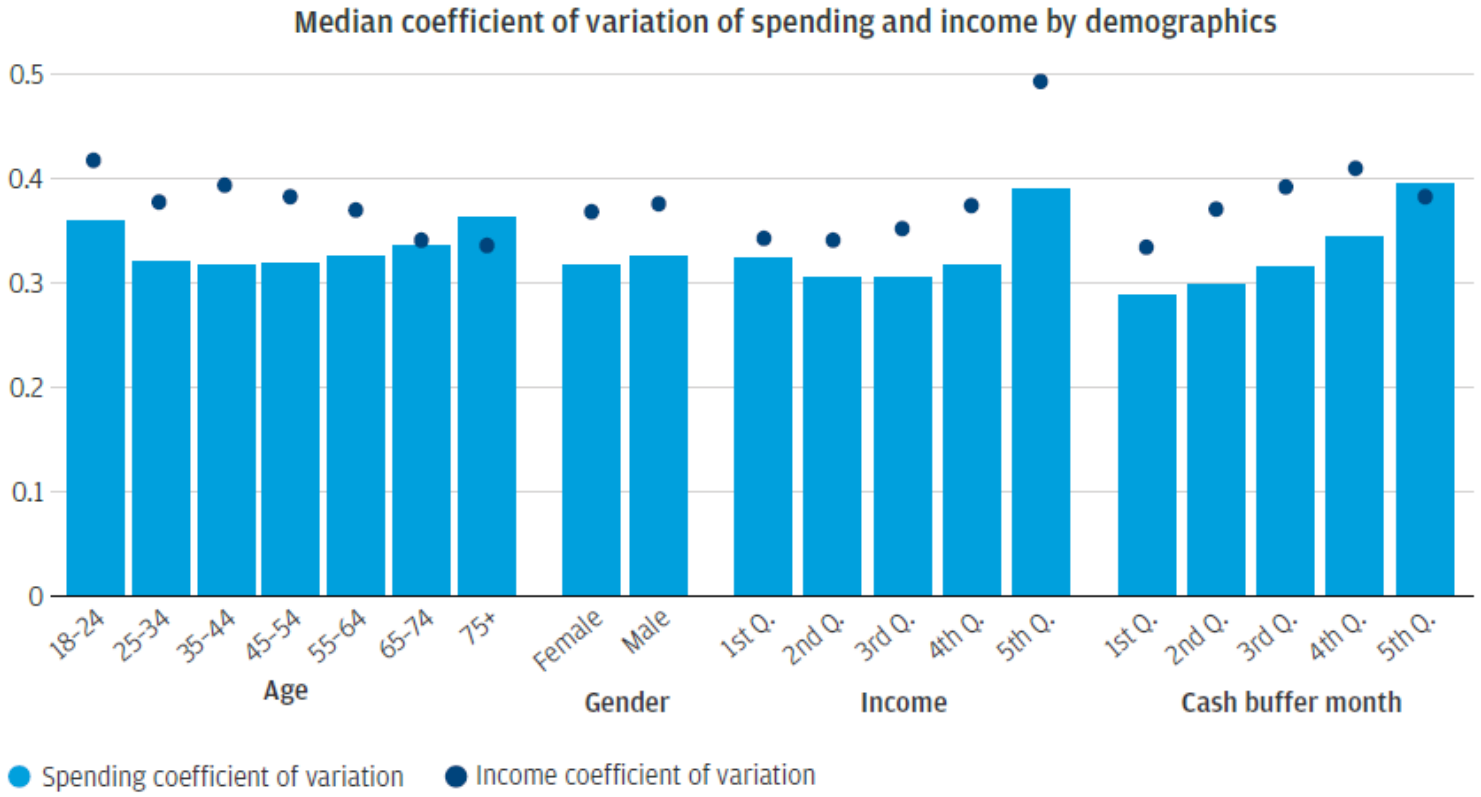
Source: JPMorgan Chase Institute

Spending volatility was flat during 2013 to 2018. The median CV for spending is 0.33, 15% lower than that of income.



Source: JPMorgan Chase Institute

Spending volatility was lower than that of income volatility, except among those over 75 and those with the largest cash buffers.



Spending volatility across demographic groups, while still high, is lower than income volatility.

4. How much of a **cash buffer** do families need to weather income and spending volatility?

Families need roughly six weeks of take-home income in liquid assets to weather a simultaneous income dip and expenditure spike. 65% of families lack a sufficient buffer.

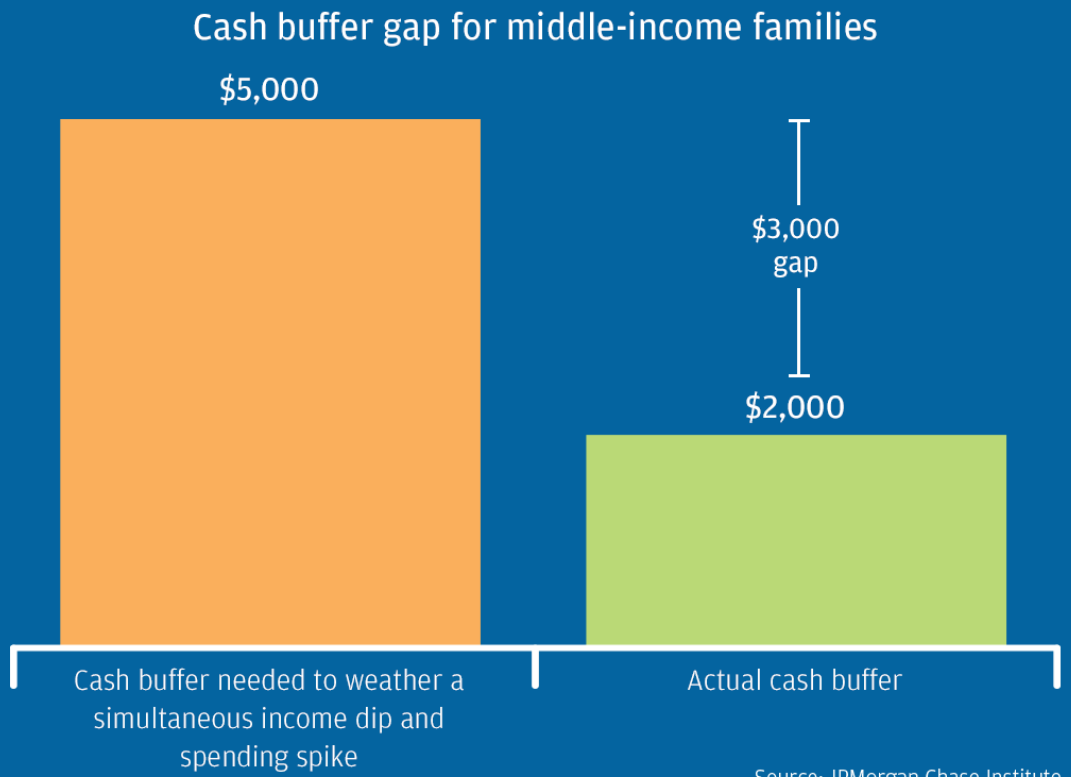
Event	Frequency	Magnitude of cash buffer needed to weather event (median weeks of income)	Proportion of families with insufficient cash buffer to weather event
Simultaneous income dip & expenditure spike	Once every 5.5 years	6.2 weeks	65 percent
Income dip	Once every 9 months	2.8 weeks	48 percent
Expenditure spike	Once every 4 months	2.6 weeks	46 percent

Source: JPMorgan Chase Institute

Middle-income families need $5,000 to weather a simultaneous income dip and expenditure spike, but typically had only $2,000.

Families need roughly six weeks of income as a cash buffer

Families need roughly six weeks of income to weather a simultaneous income dip and spending spike. For middle-income families that is $5,000, but the typical family only has $2,000, leaving a cash buffer gap of $3,000.



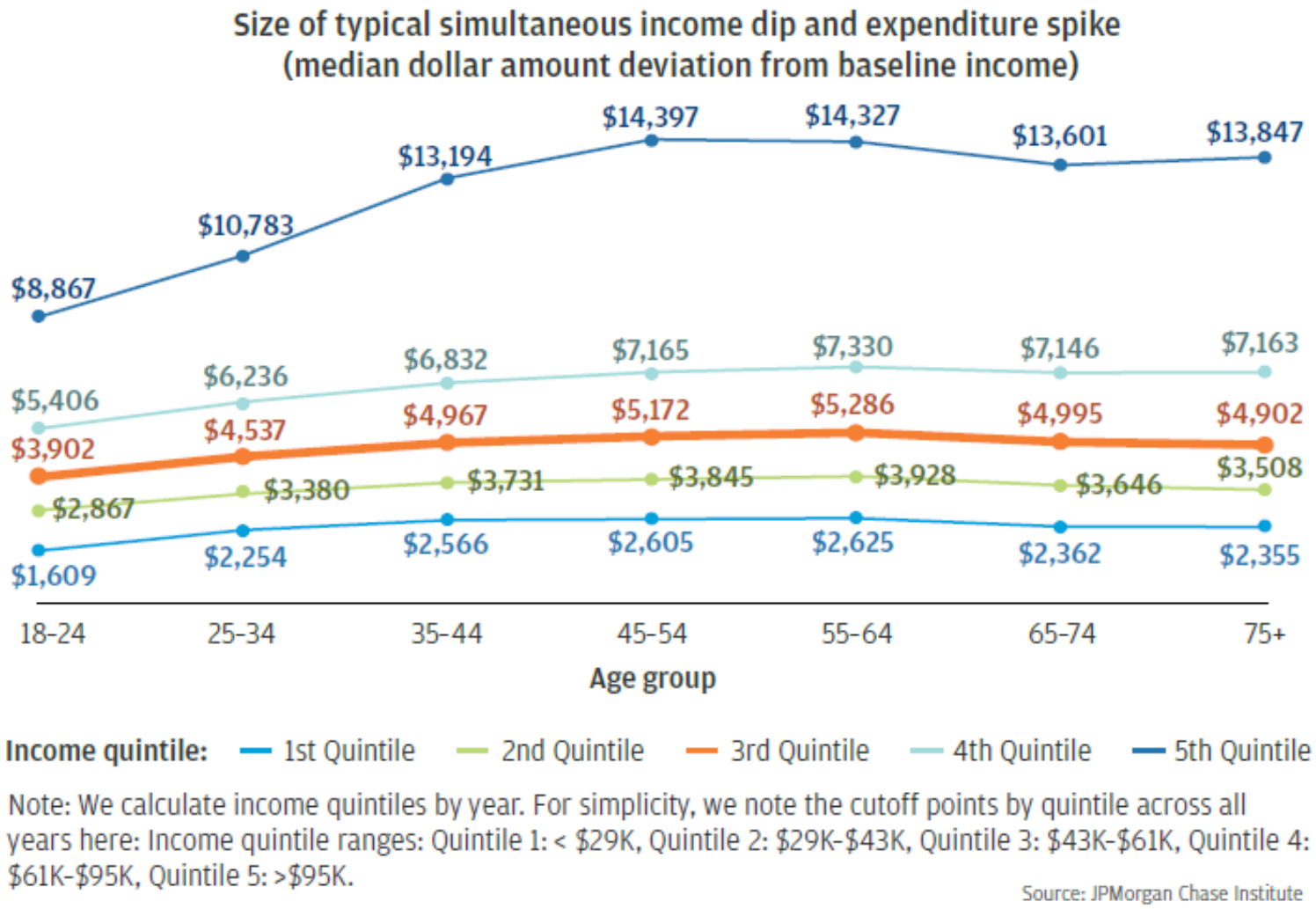
The cash buffer needed to weather a simultaneous income dip and expenditure spike varies little by age and income quintile.

Median weeks of income needed in cash buffer for a simultaneous income dip & expenditure spike

Age group	Income quintile 1	Income quintile 2	Income quintile 3	Income quintile 4	Income quintile 5
18-24	6.6	6.0	5.7	5.9	6.9
25-34	6.7	5.9	5.6	5.5	5.7
35-44	7.4	6.2	5.9	5.7	5.9
45-54	7.4	6.3	6.1	5.9	6.1
55-64	7.2	6.3	6.1	6.1	6.5
65-74	6.1	5.6	5.5	5.6	6.4
75+	6.2	5.5	5.5	5.8	6.7

4. How much of a **cash buffer** do families need to weather income and spending volatility?

Middle-income families need $5,000 to weather a simultaneous income dip and expenditure spike.



Note: We calculate income quintiles by year. For simplicity, we note the cutoff points by quintile across all years here: Income quintile ranges: Quintile 1: < $29K, Quintile 2: $29K-$43K, Quintile 3: $43K-$61K, Quintile 4: $61K-$95K, Quintile 5: >$95K.

Source: JPMorgan Chase Institute

More low-income families lack a sufficient liquid cash buffer to sustain a simultaneous income dip and expenditure spike.

Proportion of families with an insufficient cash buffer to weather simultaneous shocks

Age group	Q1	Q2	Q3	Q4	Q5
18-24	66%	58%	51%	46%	38%
25-34	74%	71%	66%	61%	56%
35-44	73%	73%	70%	67%	64%
45-54	73%	71%	69%	67%	65%
55-64	69%	66%	64%	63%	62%
65-74	61%	54%	53%	53%	53%
75+	48%	41%	40%	40%	40%

Note: We calculate income quintiles by year. For simplicity, we note the cutoff points by quintile across all years here: Income quintile ranges: Quintile 1: < $29K, Quintile 2: $29K-$43K, Quintile 3: $43K-$61K, Quintile 4: $61K-$95K, Quintile 5: >$95K.

Source: JPMorgan Chase Institute

This research has clear and specific implications for savings strategies.

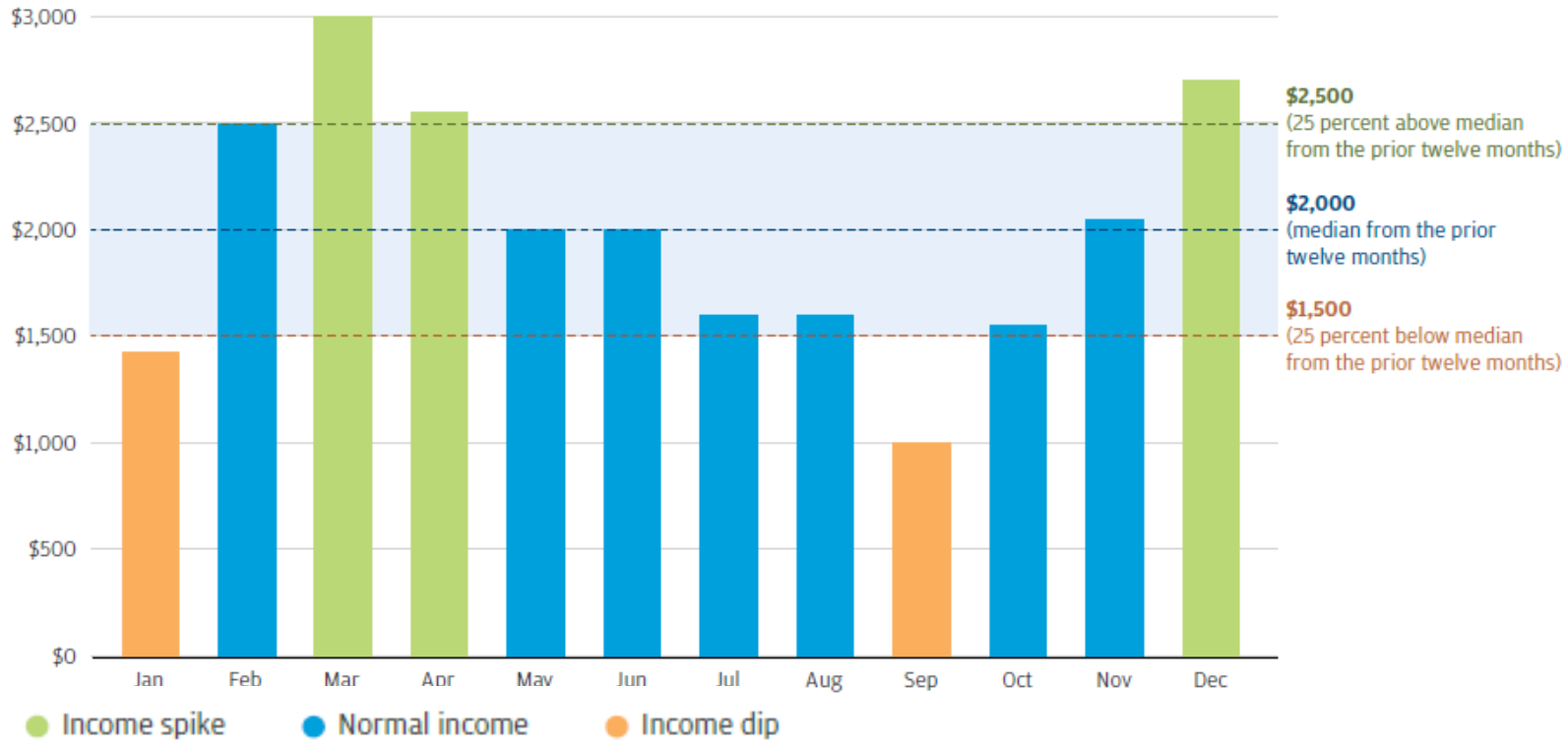
From…

- ✗ Rule of thumb to have 3-6 months worth of savings
- ✗ Single percent-based savings target every month
- ✗ Similar approach for each family each year

To…

- ✓ **Realistic and empirically-based** estimate of 6 weeks' worth of median take-home income
- ✓ **Dynamic approach** to save more during income spikes and less during income dips
- ✓ Approach **tailored** to family's unique income profile and **adjusted** over time

Illustrative example of an income spike, income dip, and normal income



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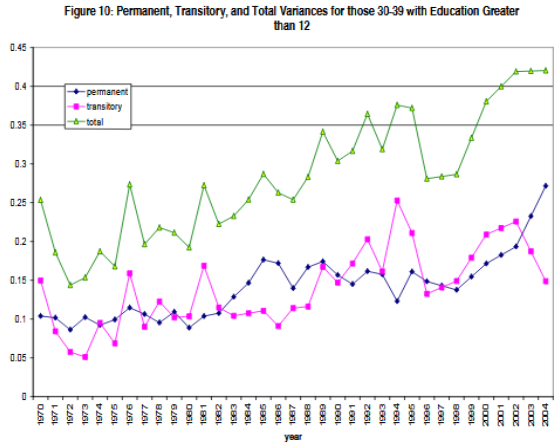
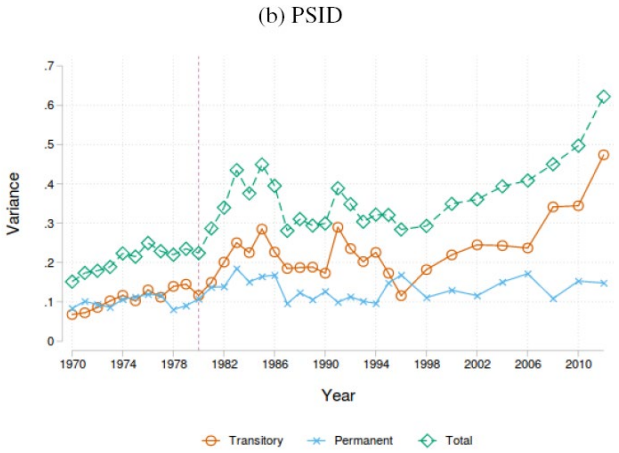
Survey and administrative data yield different results regarding trends in income volatility.

PSID and other survey data: The volatility of income shocks has increased significantly over the past 40 years.



Source: Moffitt and Gottschalk (2012)



Source: Carr and Wiemers (2017)

Administrative data such as SSA: Income volatility has been declining or stayed stable.

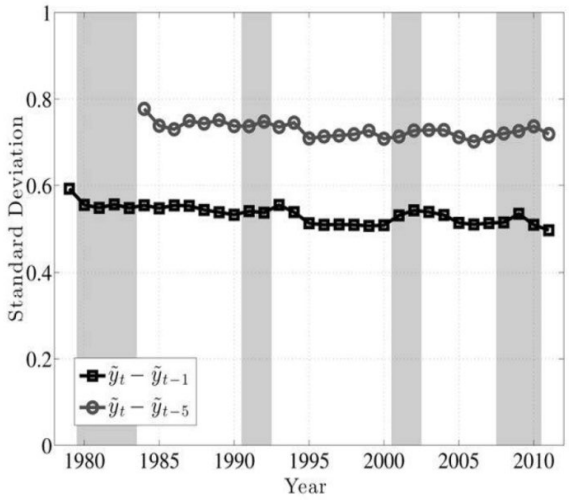
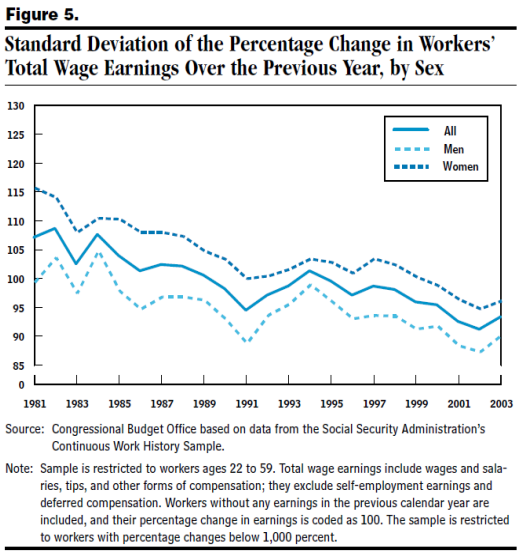


FIG. 5.—Standard deviation of transitory and persistent earnings growth

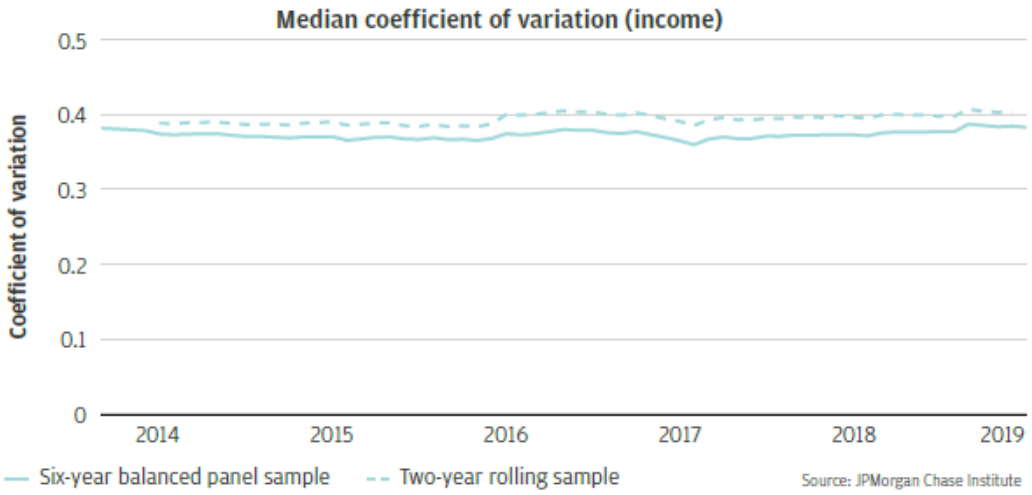
Source: Guvenen, Ozkan, and Song (2014)

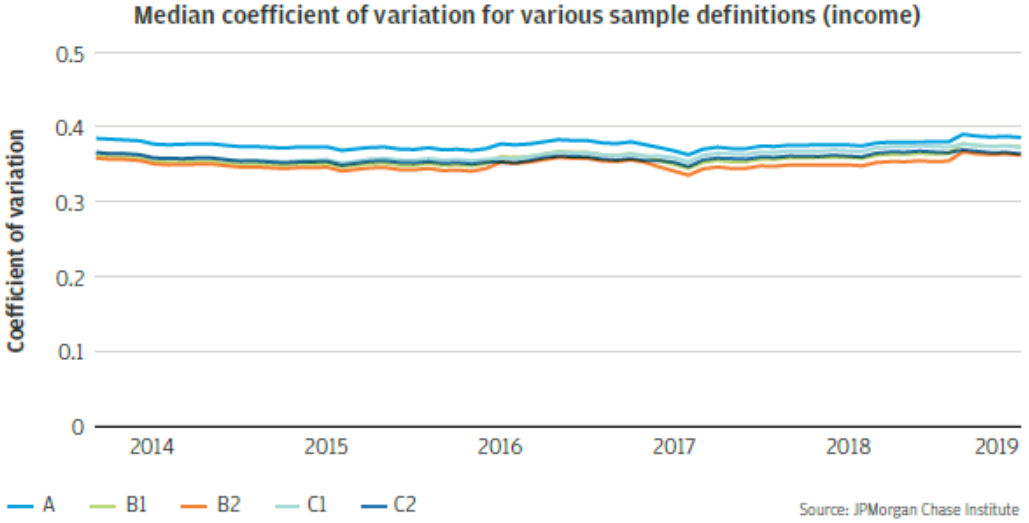


Source: CBO (2007)

Among less restrictive samples, volatility trend during the past five years remains stable.

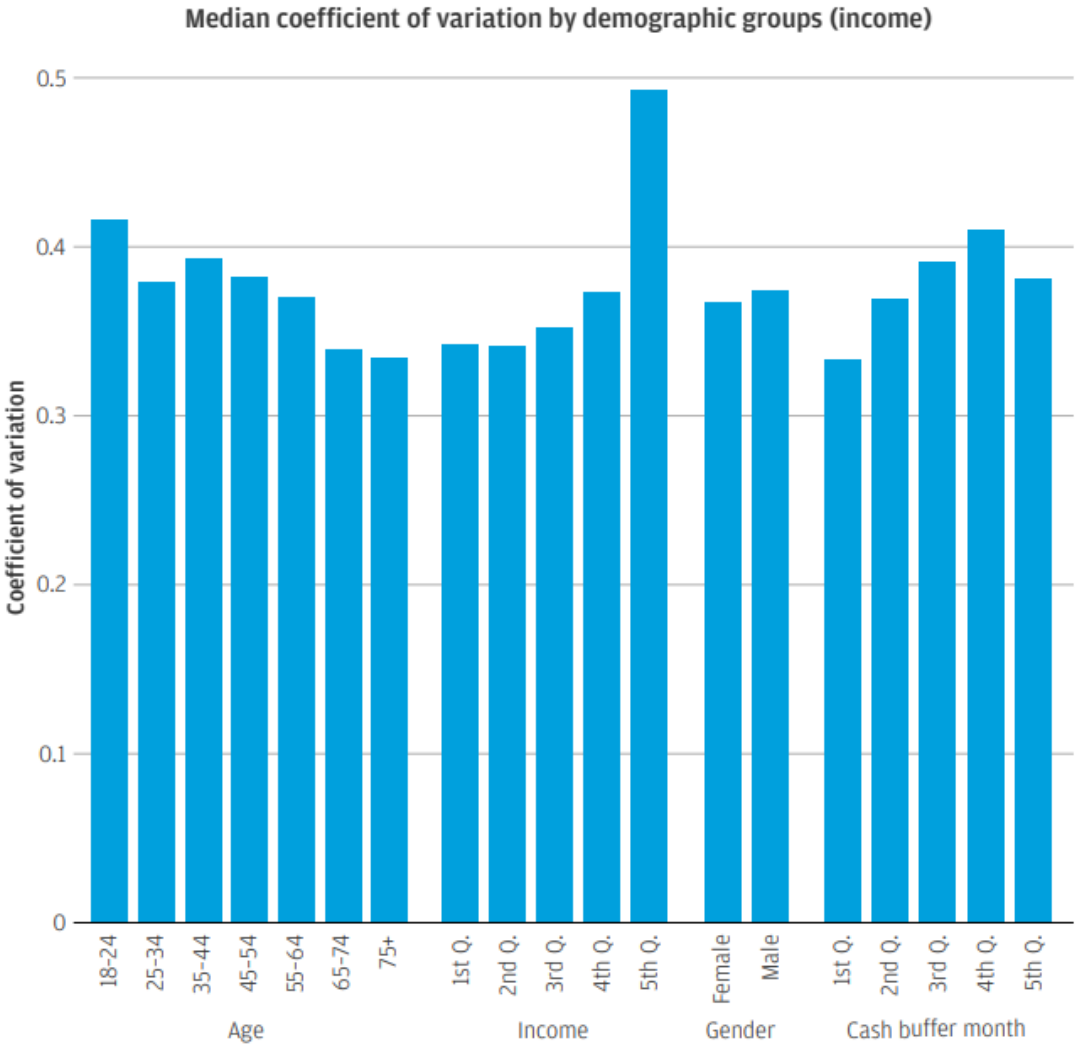
- We provide two robustness checks on the trends of income volatility measured by CV.
  - First, we measure volatility trends for a less restrictive sample than the balanced six-year panel.
  - Second, we measure volatility trends for samples with higher percentages of income from identifiable sources.





Sample	Definition
A	$400 average monthly income on a rolling 12-month basis (original sample)
B1	$400 average monthly income from identifiable sources only on a rolling 12-month basis
B2	At least 50% of total income come from identifiable sources
C1	B1 + positive annual labor income
C2	B2 + positive annual labor income

Income volatility is greatest amongst the young and the high income.



Notes: (1) Cash buffer month is calculated as the average ratio of monthly account balances (checking and savings) to monthly expenses within a year. (2) We calculate income and cash buffer month quintiles by year. For simplicity, we note the cutoff points by quintile across all years: Income quintile ranges: Quintile 1: < $29K, Quintile 2: $29K-$43K, Quintile 3: $43K-$61K, Quintile 4: $61K-$95K, Quintile 5: >$95K. Cash buffer month quintile ranges: Quintile 1: <0.24, Quintile 2: 0.24-0.47, Quintile 3: 0.47-0.92, Quintile 4: 0.92-2.35, Quintile 5: >2.35. (3) We report statistics by gender of the primary account holder for roughly 80 percent of account holders for whom gender could be reasonably inferred.

Source: JPMorgan Chase Institute

Most families do not have sufficient savings to a simultaneous income dip and expenditure spike. Middle-income families age 35-54 have a savings gap of $3,000.