

# **Financial inclusion, income inequality and macroeconomic stabilities – Exploring the links**

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# Central banks and macrostabilities

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- Price stability
- Output stability
- Financial stability

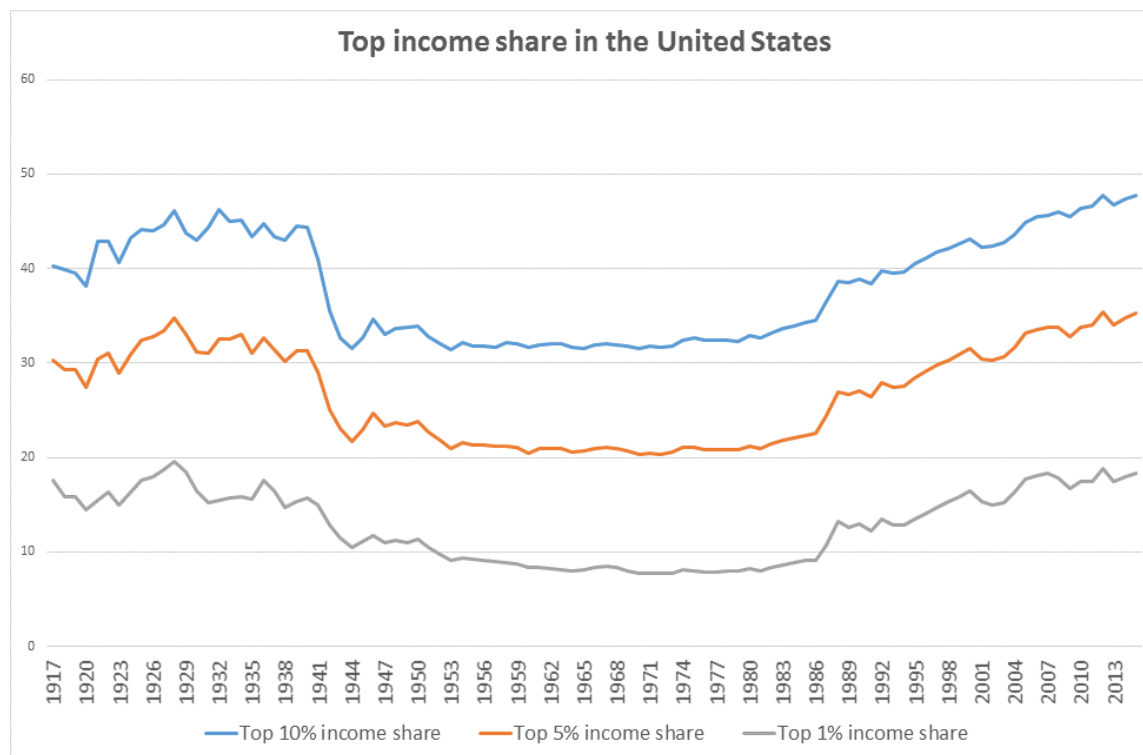
# Financial inclusion and income inequality

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- Financial inclusion: access to and use of formal financial services
- Corollary: financial exclusion implies limited asset market participation (LAMP)
- Limited asset participation and income inequality are closely linked

# High income inequality: an uncharted territory

- Income inequality is growing and sometimes at historical high



- What are the potential consequences for macrostabilities?

# Financial inclusion and financial stability

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- On average, financial inclusion and financial stability are negatively correlated
- Nonetheless, while tradeoffs dominate the inclusion-stability nexus, synergies also arise
- When disaggregating by type of service and risk concept
  - Use of credit by individuals can create tail risks: be more correlated with unexpected losses of the financial system and ultimately be associated with banking crises
  - Conversely, financial inclusion could produce synergies and mitigate expected losses of the financial sector

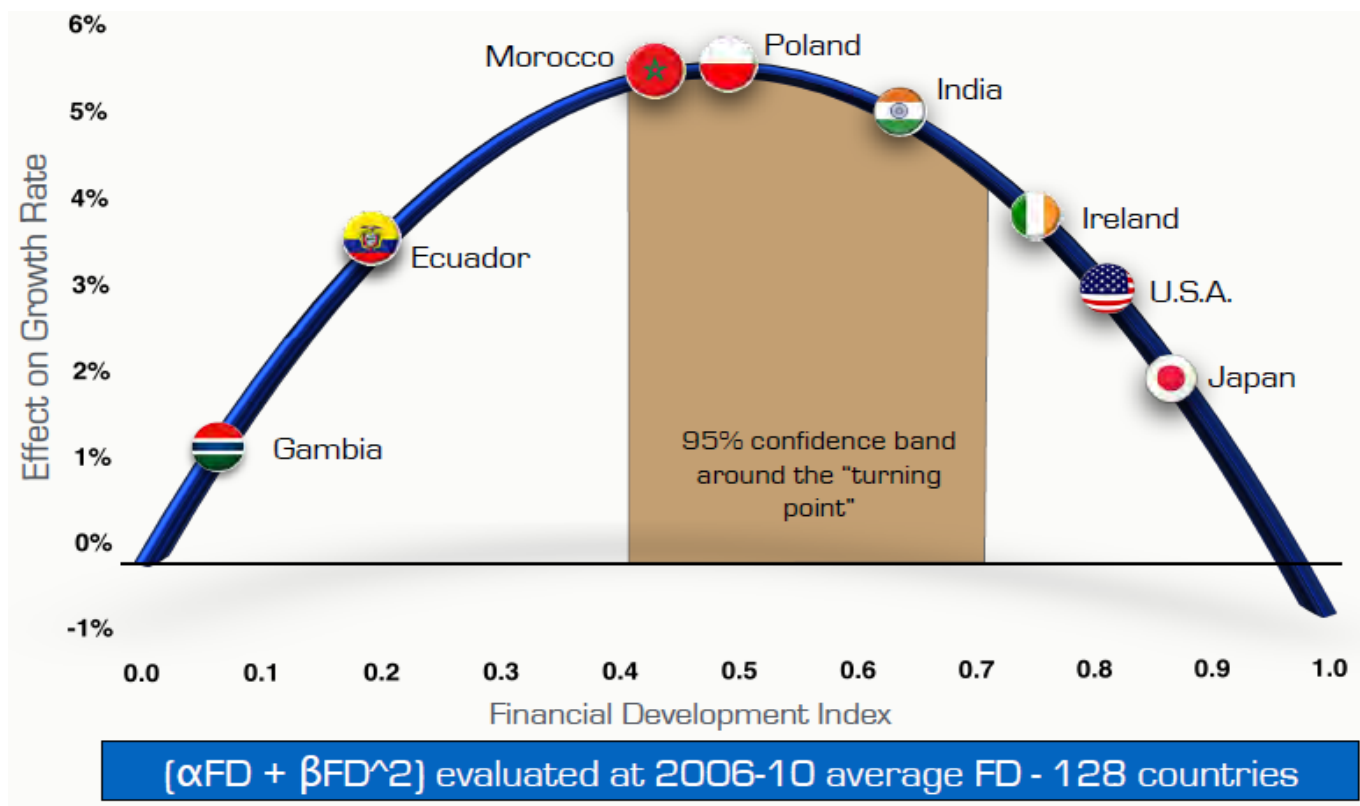
# Income inequality and financial stability

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- Rajan (2010): rising inequality forced low and middle-income households to borrow more than reasonably in order to maintain their relative consumption levels. Excess borrowing paved the way for the financial crisis.
- Kumhof and Ranci re (2010): higher demand for credit by low income to maintain their consumption level, which is met by higher supply of loans by wealthy, leading to excess credit and a weakening of the financial system, potentially triggering a financial crisis.

# Financial inclusion and output growth

- Recent empirical evidence: financial deepening helps growth, up to a point



Source: IMF Staff Discussion Note 15/08

# Income inequality and output growth

	Dependent Variable: growth rate of per capita GDP			
	Baseline	Baseline + controls		
	(1)	(2)	(3)	(4)
Log(initial income)	-0.0069** (0.0034)	-0.0081** (0.0035)	-0.0140*** (0.0037)	-0.0135*** (0.0046)
Net inequality	-0.1435*** (0.0444)	-0.0914*** (0.0336)	-0.0739*** (0.0266)	-0.1057** (0.0492)
Redistribution	0.0046 (0.0492)	0.0258 (0.0516)	0.0109 (0.0428)	0.0530 (0.0494)
Log(investment)		0.0241*** (0.0077)	0.0250*** (0.0084)	0.0076 (0.0125)
Log(population growth)		-0.0159 (0.0182)	-0.0215 (0.0174)	-0.0084 (0.0160)
Log(total education)			0.0206*** (0.0073)	0.0164* (0.0099)
Large negative terms of trade shock				-0.0424*** (0.0158)
Political institutions				-0.0011 (0.0008)
Openness				0.0091 (0.0082)
Debt liabilities				-0.0198*** (0.0059)
Constant	0.1262*** (0.0389)	0.0718 (0.0456)	0.0965** (0.0389)	0.1687*** (0.0573)
Number of observations	828	828	751	558

Source: IMF Staff Discussion Note 14/02



# Income inequality and monetary policy

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- Limited asset market participation shut down the interest rate transmission channel (Bilbiie 2008, Areosa-Areosa 2016, Ko 2016)
- Agents excluded from financial market are only indirectly affected by monetary policy through its effects on real economic activity (Kaplan, Moll, Violante 2016)

# Income inequality and monetary policy

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- Income distribution affects monetary policy transmission channel through the covariance between income and marginal propensity to consume (Auclert 2016)
- Romanian example (Voinea, Lovin, Cojocaru 2016)
  - transmission of monetary policy is more efficient for middle income households, which are more indebted and have adjustable rates
  - Low income households respond mainly to budgetary policies (direct real economic activity effect)
  - Top income quintile reacts more to monetary policy than bottom quintile, but less than middle income quintiles.

# Income inequality and the Phillips Curve

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- The Phillips Curve (e.g. Blanchard 2015)

$$\pi_t = \alpha + \theta (u_t - u_t^*) + \beta \pi_t^e + \varepsilon_t$$

- The New Keynesian Phillips Curve (e.g. Woodford 2003)

$$\pi_t = \alpha + \theta (y_t - y_t^*) + \beta \pi_t^e + \varepsilon_t$$

- The Inequality-Augmented New Keynesian Phillips Curve (e.g. Areosa and Areosa 2016)

$$\pi_t = \alpha + \theta (y_t - y_t^*) + \beta \pi_t^e + \mu \Omega_t + \varepsilon_t$$

# Intuition

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- Closed sub-economy

$$\pi_j = \alpha_j + \theta_j \hat{y}_j + \beta \pi_j^e + \varepsilon_j$$

$$\pi_j = \alpha_j + \theta_j (\hat{y} + \epsilon_j) + \beta \pi_j^e + \varepsilon_j$$

- Averaging over all sub-economies

$$\pi = \alpha + \theta \hat{y} + Cov(\theta_j, \epsilon_j) + \beta \pi^e + \varepsilon$$

# Intuition

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- Parameters as function of income distribution

$$\theta_j = \mu \epsilon_j$$

- Implying

$$\pi = \alpha + \theta \hat{y} + \mu \text{Var}(\epsilon_j) + \beta \pi^e + \varepsilon$$

- Or more generally

$$\pi = \alpha + \theta \hat{y} + \mu \Omega + \beta \pi^e + \varepsilon$$

# Empirical methodology

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- Panel estimation

$$\pi_{t,i} = \alpha_i + \theta \hat{y}_{t,i} + \mu \Omega_{t,i} + \beta \pi_{t,i}^e + \varepsilon_{t,i}$$

- Data for 52 US states
- From 1998 to 2012

# Results

Table 5: fixed effect estimation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	inf	inf	inf	inf	inf	inf	inf
ln_output_l	1.757 (1.50)	1.744 (1.49)	1.271 (1.07)	0.686 (0.57)	0.748 (0.63)	0.657 (0.55)	1.145 (0.97)
infexp	0.828*** (6.35)	0.804*** (5.41)	0.667*** (4.49)	0.583*** (3.94)	0.588*** (4.02)	0.575*** (3.89)	0.643*** (4.45)
top10		0.0104 (0.33)					
top5			0.0692* (2.24)				
top1				0.112*** (3.41)			
top01					0.152*** (3.50)		
top05						0.123*** (3.53)	
top001							0.197** (2.92)
_cons	7.551 (1.48)	7.108 (1.34)	3.657 (0.68)	1.599 (0.30)	2.590 (0.49)	1.761 (0.33)	4.678 (0.90)
<i>N</i>	780	780	780	780	780	780	780
<i>R</i> <sup>2</sup>	0.054	0.054	0.060	0.069	0.070	0.070	0.065
adj. <i>R</i> <sup>2</sup>	-0.015	-0.016	-0.010	-0.001	0.000	0.001	-0.005

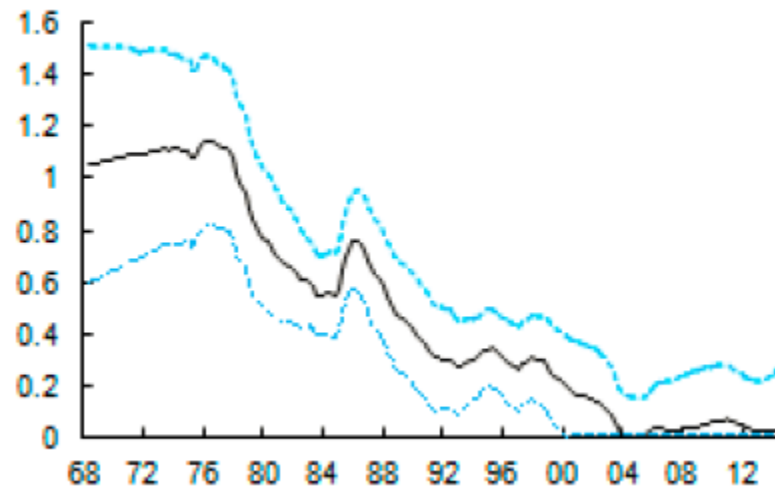
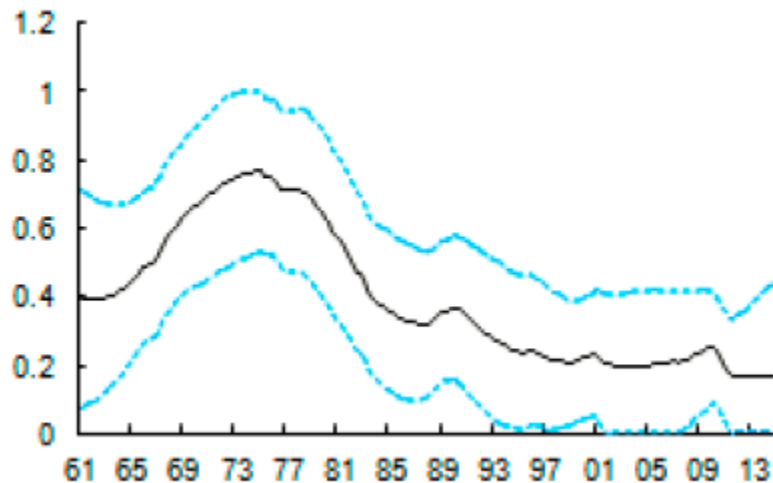
*t* statistics in parentheses

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

# Possible interpretation

- Blanchard, Cerruti and Summers (2015) : effect of unemployment gap on inflation has substantially decreased since the 1970s

Slope of Phillips Curve ( $\theta$ ) (dotted blue line +/- 1 standard deviation)





# Possible interpretation

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- But if income distribution plays a role, BCS equation is misspecified: its residuals are correlated with income inequality
- The decrease of unemployment gap coefficient might reflect the bias introduced by “forgetting” the impact of increasing income inequality

# Conclusion

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- Is increasing income inequality a new challenge for central banks?
- Financial stability: first insights point to yes
- Output stability: stronger empirical evidence that more inequality might be detrimental to growth
- Price stability: maybe a link with inequality through the Philipps curve
- Monetary policy transmission channel: definitely yes