Monetary Policy and Redistribution in Open Economies

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The views in this paper are those of the authors and do not reflect those of the Bank of Canada.

Motivation

- **Redistributional** effects of globalization has featured prominently in policy debates
  - Increasingly influential view, "*Globalization and its Discontents*" Stiglitz 02,17 :
  - international integration has **asymmetric effects** on households
  - macro policies can amplify the resulting inequality
- Large academic advances in trade & labor e.g. Goldberg Pavcnik (07), Autor Dorn Hanson (16)
  - Less known in international macro

This paper:

- **Distributional effects** of external shocks in open economies w/ **uneven integration**
- How does **monetary policy** affect the distributional effects?

Key Takeaways from a Small Open-economy HANK Model

1. How "macro matters for inequality":
   - Heterogeneity in hhs' integration **key source of unequal C responses** to external shocks
   - C of hhs working in tradable sectors more sensitive to external demand shocks
   - C of hhs with holdings of foreign securities more sensitive to foreign monetary policy

2. How "inequality matters for macro":
   - Trade-off btw **aggregate stabilization & inequality** for MP facing external shocks
   - Fixed-exchange-rate **amplifies agg C response** but leads to **less unequal C responses**

Related Literature

1. **Monetary policy in open economies**
   - Obstfeld Rogoff (00), Clarida Gali Gertler (01), Chari Kehoe McGrattan (02), Devereux Engel (03), Corsetti Pesenti (05), Gali Monacelli (05)
   - Engel (06), Gopinath Itskhoki Rigobon (10), Corsetti Dedola Leduc (10), Burstein Gopinath (14), Gopinath et al (20), Mukhin (20), Egorov Mukhin (20)
   - Schmitt-Grohe Uribe (11), Gabaix Maggiori (15), Rey (15), Hassan Mertens Zhang (16), Giovanni Kalemli-Ozcan Ulu Baskaya (17), Gourinchas (18), Itskhoki Mukhin (19,20), Arellano Bai Mihalache (20)
2. **Consumption inequality & redistributive effects of macro policies**
   - Attanasio Battistin Ichimura (04), Doepke Schneider (06), Krueger Perri (06), Aguiar Bills (15), Quadrini Rios-Rull (15), Ahn et al (18), Auclert (19), Kaplan Moll Violante (18)
3. **Households' heterogeneity in open economies**
   - De Ferra Mitman Romei (20), Cugat (20), Auclert Rognlie Souchier Straub (20), Zhou (20), Guntin Ottonello Perez (20)

Model

Households: Decision Problem

Choices: labor (l), consumption (c), and saving/borrowing ($\mathbf{b}' \equiv [b'_D, b'_E]$)

- Consumption: home (c_{H}), foreign (c_{F}), and non-tradable (c_{N}) Gali Monacelli (05)
  - Synthesized through CES aggregators: $c_{\mathrm{T}} = \mathcal{C}_{\mathrm{HF}}(c_{\mathrm{H}}, c_{\mathrm{F}})$, $c = \mathcal{C}_{\mathrm{TN}}(c_{\mathrm{T,N}})$
- Saving/borrowing: domestic (b'_D) and external assets (b'_E)

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Recursive problem:

$$V_t(\mathbf{b}, z, o_R, o_F) = \max_{c_{\mathrm{H}}, c_{\mathrm{F}}, c_{\mathrm{N}}, l, \mathbf{b}' \in \mathcal{B}(o_F)} u(c, l) + \beta \mathbb{E}_t \left[V_{t+1}(\mathbf{b}', z', o'_R, o'_F) \right]$$

$$\text{s.t. } \sum_{a \in \{D,E\}} b_a + \underbrace{z(1-\tau_t) W_t(o_R) l}_{\text{labor income}} + T_t(z) = \underbrace{\sum_{s \in \{\mathrm{H,F,N}\}} P_{st} c_s}_{\text{consumption expenditure}} + \underbrace{\sum_{a \in \{D,E\}} q_{at} \cdot b'_a}_{\text{savings in local currency}} + \underbrace{\Phi(\mathbf{b}', o_F)}_{\text{portfolio adj. cost}}$$

- $W_t(o_R)$, τ_t, $T_t(z)$: nominal wage, labor income tax, transfers (government & firms)

Households: 3 Sources of Heterogeneity

Real integration: work in tradable or non-tradable sectors

- $o_R = \{$integrated (**tradable**), non-integrated (**non-tradable**)$\}$
- Exogenous transition [extension: endogenous transition]

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Households: 3 Sources of Heterogeneity

Financial integration: the access to domestic and external bond

- $o_F = \{$integrated (**both types of bond**), non-integrated (**only domestic bond**)$\}$
- Exogenous transition [extension: endogenous transition; foreign currency denomination]

Recursive problem:

$$V_t(\mathbf{b}, z, o_R, \mathbf{o_F}) = \max_{c_{\mathrm{H}}, c_{\mathrm{F}}, c_{\mathrm{N}}, l, \mathbf{b}' \in \mathcal{B}(\mathbf{o_F})} u(c, l) + \beta \mathbb{E}_t \left[V_{t+1}(\mathbf{b}', z', o'_R, o'_F) \right]$$

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$\mathbf{o_F}$	Portfolio option set $\mathcal{B}(o_F)$	Portfolio adj. cost $\Phi(\mathbf{b}', o_F)$
Integrated	$q_{Et} \cdot b'_E + q_{Dt} \cdot b'_D \geq \underline{b}$	$\frac{\psi}{2} \cdot \left(b'_D / (b'_D + b'_E) - \alpha \right)^2 \cdot \lvert b'_D + b'_E \rvert$
Non-Integrated	$b'_E = 0, \; q_{Dt} \cdot b'_D \geq \underline{b}$	0

Households: 3 Sources of Heterogeneity

Idiosyncratic productivity: z

- Feature realistic income distribution
- Heterogeneity in MPCs (by including borrowing constraint)

Recursive problem:

$$V_t(\mathbf{b}, \mathbf{z}, o_R, o_F) = \max_{c_{\mathrm{H}}, c_{\mathrm{F}}, c_{\mathrm{N}}, l, \mathbf{b}' \in \mathcal{B}(o_F)} u(c, l) + \beta \mathbb{E}_t \left[V_{t+1}(\mathbf{b}', z', o_R', o_F') \right]$$

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- $T_t(\mathbf{z})$: transfer of firms' profit proportional to z Kaplan, Moll and Violante (18)

Firms

Final goods producers:

- Produce H & NT goods w/ CES technology & intermediate inputs

Intermediate goods producers:

- Produce intermediate goods in H and NT sector w/ CRS technology & labor
- Monopolistic competition: face demand from final good producers
- Set prices in local currency, w/ adj costs à la Rotemberg [extension: pricing in dollars]

Government & Rest of the World

Government:

- Taylor rule for domestic interest rate, determines price of domestic nominal bonds

$$q_{Dt} = \frac{1}{1 + i_t}$$

- Fixed domestic bond issuance, spending, and transfer; variable labor tax rate τ_t
  [extension: alternative fiscal policies]

Rest of the world:

- International interest rate, determines price of external nominal bonds

$$q_{Et} = \frac{1}{1 + i_t^* + \mathbb{E}_t \frac{\mathcal{E}_{t+1}}{\mathcal{E}_t}}$$

- Completely elastic supply of F goods; downward-sloping demand for H goods $(\frac{P^*_{\mathrm{H}t}}{P^*_{\mathrm{F}t}})^{-\eta} Y^*_{\mathrm{F}t}$

Shocks and Exchange-rate Regimes

Aggregate shocks: one domestic and two external

1. Domestic monetary policy shock $\Rightarrow i_t$
2. Foreign demand shock $\Rightarrow Y^*_{F,t}$
3. Foreign monetary policy shock $\Rightarrow i^*_t$

Alternative exchange-rate regimes:

1. Flexible (benchmark)
2. Fixed

Calibration

Calibration Strategy

1. **Standard pre-determined parameters** (hhs preferences, govermment, firms) ▸ Parameters
2. **Idiosyncractic risk** ▸ Parameters ▸ Income dynamics moments ▸ Average MPC by wealth
   - Process for z: match high-order moments of income dynamics
   - Borrowing constraint $\underline{b}$: match median MPC of 15%
3. **International integration**
   - Transition probabilities: match the share of integrated hhs and the persistence of their status
   - Home bias α: match the avg. portfolio choice of financially integrated hhs
4. **Aggregate responses** ▸ Parameters ▸ Conditional moments
   - Target responses of agg variables to macro shocks

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Calibrate Households' Integration : Extensive and Intensive Margins

Measure the international integration of Canadian households ▸ Real: StatCan ▸ Fin.: OSFI-GQ+CFM

- **Real**: 37% working in tradable sectors, qtr persistence 96% Loungani and Rogerson (89)
- **Financial**: 33% w/ foreign asset share above avg (10%), annual persistence 73.5%
  - Household-level portfolio: Canadian Financial Monitor (survey data)
  - Financial-institute-level foreign asset share: GQ Return (regulatory filing data)

  ⇒ Financially integrated hhs hold 21% of their portfolio in foreign bond on average.

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Calibrate $\alpha = 1 - 21\%$ and the transition probabilities of integration status ▸ Parameters

- Independent Markov processes ⇒ avg share of integrated hhs and their persistence

Results

Focusing on Foreign Demand Shock

1. Dispersion of C Responses: Size, Source, and Mechanism
2. How does Exchange-rate Regime Shape the Dispersion?

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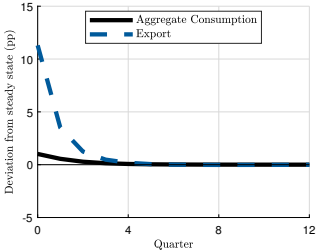
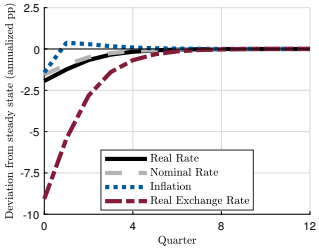
Higher Foreign Demand ⇒ Agg C ↑, Currency Appreciation, C Dispersion

(a) Agg Quantities



(b) Interest Rates and Inflation



1. Higher demand for H goods ⇒ output ↑ and wage ↑ in T sector ⇒ agg demand ↑
2. Currency appreciation and expenditure switching

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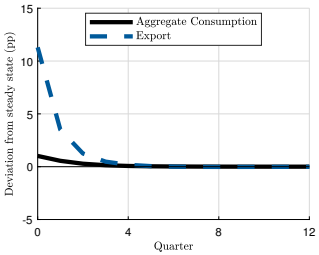

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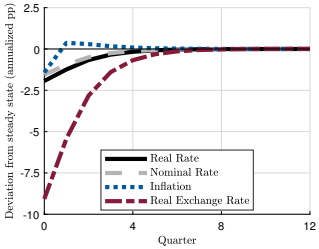
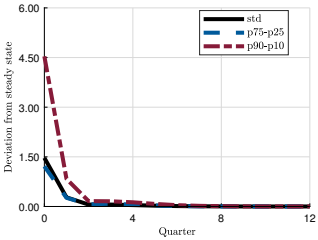


(c) C Dispersion



1. Higher demand for H goods ⇒ output ↑ and wage ↑ in T sector ⇒ agg demand ↑
2. Currency appreciation and expenditure switching
3. Sizable dispersion: std. of individual C responses $\approx 1.5\times$ agg C response

Key Source of C Response Dispersion: International Integration

Share of C Dispersion Explained (%)	
Real integration	**54.4**
Financial integration	0.8
Net wealth	2.8
Idiosyncratic income	0.4

▸ More details

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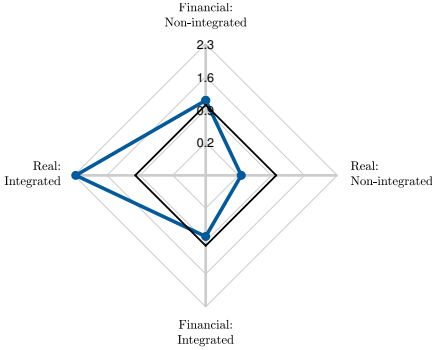
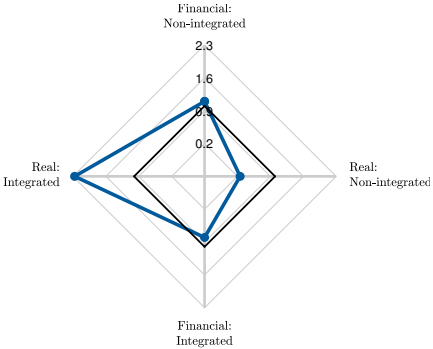
C Response: Integrated vs. Non-integrated



Key Channel for C Response Dispersion: Exposure to Different Prices

C Response: Integrated vs. Non-integrated



By Real Integration	Non-Int.	Integrated
C (relative to agg)	0.26	2.26
Decomposition by Channels		
Real interest rate	0.42	0.42
Labor income	**-0.27**	**1.74**
Others	0.10	0.10

- Why is wealth not the most relevant dimension of heterogeneity?

Results

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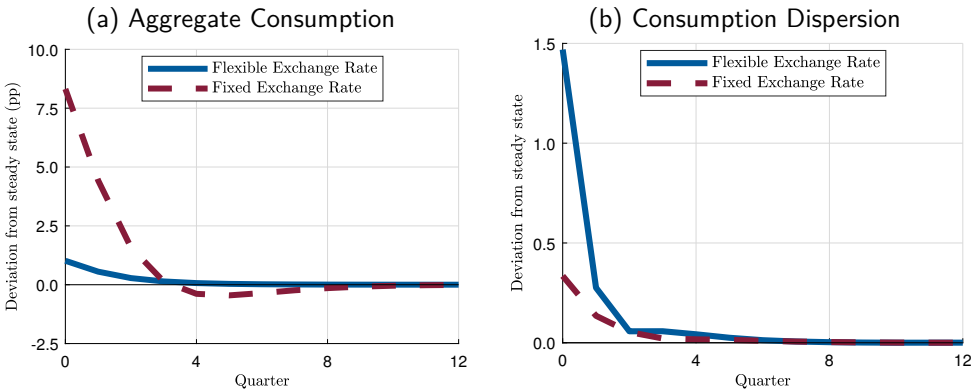
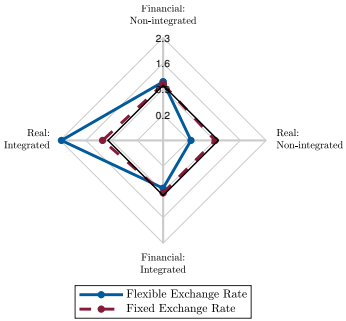
2. How does Exchange-rate Regime Shape the Dispersion?

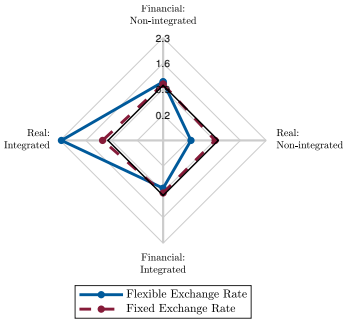
Exchange-rate Regimes: Trade-off btw Agg Stabilization & Inequality



Fixed ER: More Equal C Responses



Fixed ER: More Equal C Responses due to Less Different W Responses



	Flexible		Fixed	
Real Integration	Non-Int.	Int.	Non-Int.	Int.
Cons (relative to agg)	0.26	2.26	0.91	1.15
Decomposition by Channels				
Real interest rate	0.42	0.42	0.44	0.44
Labor income	**-0.27**	**1.74**	**0.28**	**0.51**
Others	0.10	0.10	0.19	0.19

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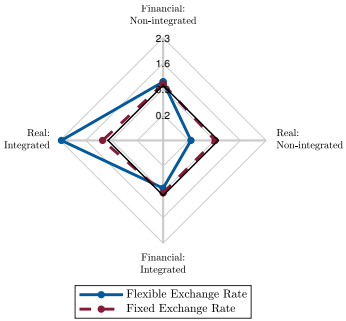

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- Wage response diff. $\frac{\Delta w_H}{\Delta w_N}$: $\frac{5.7\%}{-0.8\%} \approx \mathbf{-7}$ vs. $\frac{13.3\%}{6.8\%} \approx \mathbf{2}$ ▸ Agg prices
- Fixed-rate regime:
  - Monetary authority lowers interest rate to avoid currency appreciation
  - Stimulated aggregate demand increases the real wage in non-tradable sector

Extensions and Robustness Checks

Extensions ▸ Details

1. Endogenous transitions for international integration
2. Dollar pricing for tradable firms
3. Foreign asset denominated in foreign currency
4. Financially integrated households w/o home bias

Robustness Checks

1. Correlation between international integration and level of net wealth ▸ Details
2. Role of international integration ▸ Details
3. Comparison with open-economy RANK & closed-economy HANK ▸ Details

Conclusion

Conclusion

We study how monetary policy shapes asymmetric effects of external shocks in open economies

- HHs' international integration relevant for asymmetric responses to external shocks
- Trade-off btw maintaining aggregate stability & reducing income, cons inequalities

Appendix

Calibration: Fixed Parameters

Return

Parameter	Description	Value
Households		
ξ	Exit rate	$\frac{1}{82.5\times 4}$
$1/\nu_c$	Intertemporal elasticity of substitution	1
$1/\nu_l$	Frisch elasticity of labor supply	1
ψ	Disutility of labor	3.46
β	Discount factor	0.96
Government		
τ	Income tax rate	0.20
T_{ss}	Total transfer	0.12
B_{ss}	Government debt	0.86
i^*_{ss}	Steady-state international interest rate, annualized	0.01
Firms		
ϵ	Elasticity of substitution for final goods aggregator	10
θ	Adjustment cost of goods price	100

Notes: The values for T_{ss} and B_{ss} are expressed in the unit of households' quarterly average labor income in steady state.

Calibration: Idiosyncratic Risk

Return

- Idio. prod. as a sum of two Markov processes: $\ln z = z_1$ (persistent) $+z_2$ (transitory)
  - z_1 and z_2 constructed using Rouwenhorst method

Parameter	Description	Value
ρ_1	Persistent idiosyncratic income, autocorrelation	0.75
σ_1	—, unconditional standard deviation	0.78
$skew_1$	—, unconditional skewness	-4.07
ρ_2	Transitory idiosyncratic income, autocorrelation	0.25
σ_2	—, unconditional standard deviation	0.31
$skew_2$	—, unconditional skewness	-2.05
$\underline{b}$	Borrowing constraint	-0.21

Notes: The value of $\underline{b}$ is expressed in the unit of households' quarterly average labor income in steady state.

Labor Income Dynamics: Model vs. Data

Return

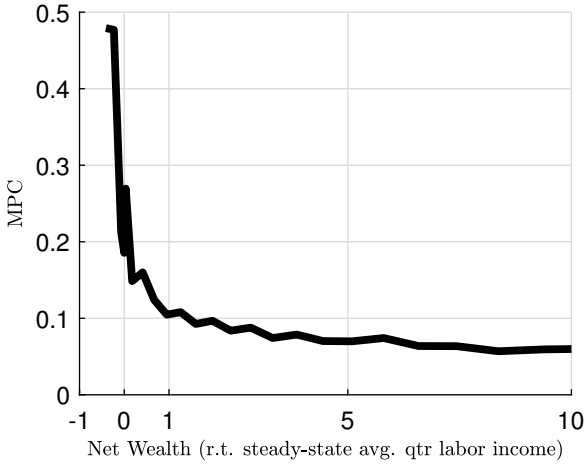
Targeted Moments for Log Annual Earnings

	1-year Change		5-year Change	
	Model	Data	Model	Data
Variance	0.47	0.49	0.71	0.69
Skewness	-0.27	-0.81	-0.29	-0.71
Kurtosis	15.56	15.55	13.33	10.33

Notes: Data moments from Bowlus, Gouin-Bonenfant, Liu, Lochner and Park (2020).

Average MPC Conditional on Net Wealth in Model

Return



Calibration: International Integration

Return

Parameter	Description	Value
Transition Probability of Integration Status		
λ_F^1	Financial integration, probability of remaining integrated	92%
λ_F^0	—, probability of remaining nonintegrated	96.06%
λ_R^1	Real integration, probability of remaining integrated	96%
λ_R^0	—, probability of remaining integrated	97.65%
Preferences (steady state with equalized wage)		
ω_T	Fraction of tradable goods in consumption basket	0.33
ω_H	Fraction of home goods in tradable goods consumption basket	0.60

Calibration: Aggregate Responses

Return

Parameter	Description	Value
Households and government		
ψ	Portfolio adjustment cost	0.80
η	Intratemporal elasticity of substitution	6.19
ϕ_π	Taylor rule, coefficient of inflation	1.10
ϕ_i	—, coefficient of lagged nominal interest rate	0.87
Aggregate shocks		
ρ_m	Domestic monetary shock, persistence	0.68
σ_m	—, std.	0.25%
ρ_{m^*}	Foreign monetary shock, persistence	0.81
σ_{m^*}	—, std.	0.25%
ρ_{y^*}	Foreign demand shock, persistence	0.50
σ_{y^*}	—, std.	15%

Aggregate Conditional Moments

Return

Targeted Moments for Aggregate Impulse Responses (%)

	Data	Model
Response to Domestic Monetary Shock		
Consumption	[0.5, 1.5]	0.54
Nominal Interest Rate	[-1.2, -0.5]	-0.03
UIP Deviation	[-1.4, 0.5]	-0.44
Relative Price	[-1.5, 1.0]	-0.06
Response to Foreign Demand Shock		
Consumption	[0.8, 1.6]	1.02
Exchange Rate	[-4, -2]	-2.62
Export	[8, 12]	11.30

Notes: The reported 65% confidence interval of peak responses are from Champagne and Sekkel (2018) and Charnavoki and Dolado (2014).

Measurement of Real Integration

Return

- Non-tradable sectors
  - Utilities; real estate, rental, and leasing; construction; transportation and warehousing
  - Accommodation and food services; retail trade; other private services; public administration
- Tradable sectors
  - Agriculture, mining and energy; manufacturing
  - Information, culture and recreation; finance and insurance; professional and technical services; wholesale trade

Share of Tradable Sectors in Canadian Economy (%)

Employment	GDP	Labor Compensation
37	45	42

Source: Statistics Canada

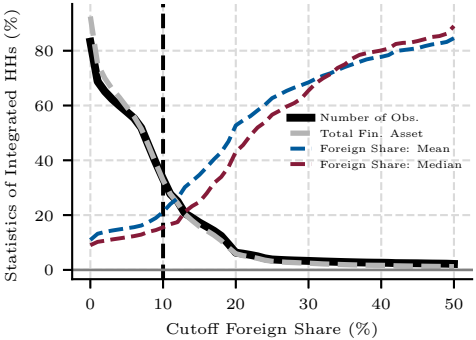
Measurement of Financial Integration

Return

Data Source (2014Q4-2018Q4)

1. Canadian Financial Monitor
   - Monthly survey of households' portfolio
   - Key information: hhs' asset by financial institutes
2. GQ Return
   - Quarterly regulatory filing of financial institutes' asset
   - Key information: financial institutes' asset by geographical location

Integrated hhs at Different Cutoffs



Variance Decomposition

Return

Share of Dispersion Explained by Source of Heterogeneity

	Domestic Monetary Shock	Foreign Demand Shock	Foreign Monetary Shock
Real Integration	1.1	**54.5**	16.7
Financial Integration	1.5	0.9	**31.7**
Net Wealth	**36.5**	2.8	17.2
Idiosyncratic Labor Income	33.9	0.4	0.7

International Spillovers: Decomposing C Response by Channels

Return

	Foreign Demand Shock				Foreign Monetary Shock			
	By Real Int.		By Fin. Int.		By Real Int.		By Fin. Int.	
	N	I	N	I	N	I	N	I
Cons (relative to agg)	0.26	2.27	1.11	0.79	1.92	-0.56	-0.47	3.99
Real interest rate channel	0.42	0.42	**0.53**	**0.21**	1.70	1.70	**0.23**	**4.69**
Labor income channel	**-0.27**	**1.74**	0.47	0.47	**0.33**	**-2.14**	-0.59	-0.58
Others channels	0.10	0.10	0.10	0.10	-0.12	-0.12	-0.12	-0.12

Foreign Demand Shock: Decomposing C Response by Channels

Return

	By Real Int.			By Fin. Int.			By Net Wealth		
	N	I	Diff	N	I	Diff	Low	High	Diff
Cons (relative to agg)	0.26	2.27	**-2.01**	1.11	0.79	**0.32**	1.23	0.86	**0.37**
Real interest rate channel	0.42	0.42	0	0.53	0.21	**0.32**	0.18	0.57	**-0.39**
Labor income channel	-0.27	1.74	**-2.01**	0.47	0.47	0	0.93	0.20	**0.73**
Others channels	0.10	0.10	0	0.10	0.10	0	0.12	0.09	0.03

Extension: Endogenous Transition of Integration Status

Return

- Setup:
  - Fixed cost to adjust their type of integration
  - Preference shocks following extreme value dist. $\Rightarrow$ Logit model conditional on adjustment

Consumption Responses to Aggregate Shocks: Baseline vs. Extension

	Domestic Monetary		Foreign Demand		Foreign Monetary	
	Baseline	Extension	Baseline	Extension	Baseline	Extension
Aggregate (%)	0.51	0.51	1.10	1.08	0.06	0.06
Diff. by Real Int.	0.03	0.03	**-1.93**	**-1.84**	0.94	0.94
Diff. by Fin. Int.	0.35	0.34	0.80	0.78	**-5.78**	**-5.64**

Extension: International Pricing

Return

- Setup: price adjustment cost based on the price in foreign currency

Consumption Responses to Aggregate Shocks: Baseline vs. Extension

	Domestic Monetary		Foreign Demand		Foreign Monetary	
	Baseline	Extension	Baseline	Extension	Baseline	Extension
Aggregate (%)	0.51	0.37	1.10	2.80	0.06	0.10
Diff. by Real Int.	0.03	1.00	**-1.93**	**-2.46**	0.94	-0.62
Diff. by Fin. Int.	0.35	0.26	0.80	0.78	-5.78	-3.08

Extension: Model with Capital and Investment

Return

- Setup: representative capital producer transforming foreign goods into capital goods

Consumption Responses to Aggregate Shocks: Baseline vs. Extension

	Domestic Monetary		Foreign Demand		Foreign Monetary	
	Baseline	Extension	Baseline	Extension	Baseline	Extension
Aggregate (%)	0.51	0.29	1.10	0.80	0.06	0.20
Diff. by Real Int.	0.03	-1.55	**-1.93**	**-0.55**	0.94	0.94
Diff. by Fin. Int.	0.35	-0.14	0.80	-0.05	-5.78	-9.06

Comparison between RANK, HANK and OHANK

Return

Consumption Responses to Domestic Monetary Shock in Alternative Models

	Open-economy HANK	Closed-economy HANK	Open-economy RANK
Aggregate (%)	0.51	0.58	0.25
Std.	0.29	0.23	-
Diff. by Net Wealth	0.38	0.29	-
Decomposition of Aggregate Consumption Response (%)			
Real Interest Rate	36	37	83
Labor Income	54	48	19
Others	10	15	-2

Role of Intnl Integration: Less integration → more inequality in C responses

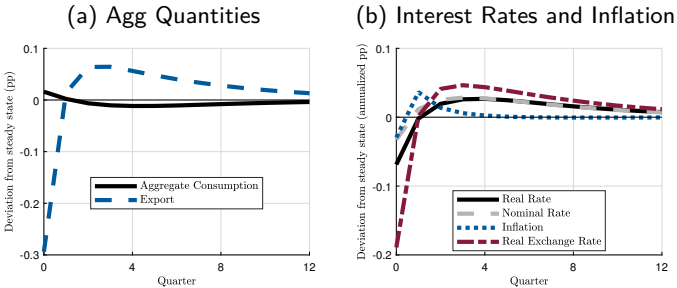
▸ Return

	Canada intnl int. (36%,18%)	Lower intnl int. (15%,5%)
Aggregate cons responses		
Domestic monetary shock	0.51	0.55
Foreign demand shock	1.09	0.16
Foreign monetary shock	0.06	0.01
Dispersion of cons responses		
Domestic monetary shock	0.29	0.26
Foreign demand shock	**1.18**	**2.53**
Foreign monetary shock	**2.39**	**8.56**

- Weaker agg rsp to external shocks → weaker policy and GE rsp to mitigate the price gaps

▸ Financial integration ▸ Real integration

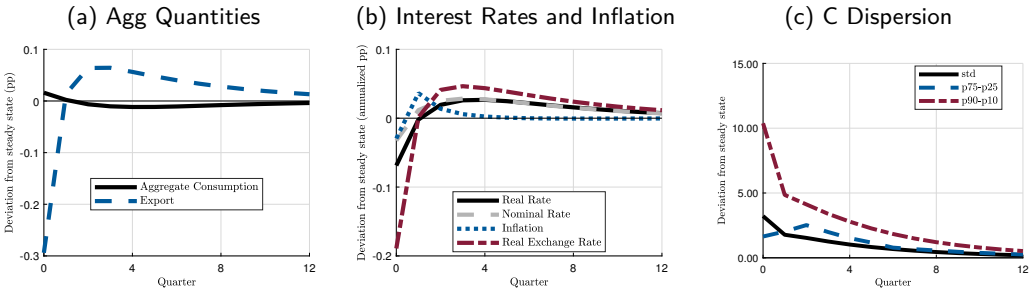
Expansionary Foreign Mon Pol Shock ⇒ Agg C↑, Appreciation, C Dispersion



a Lower intnl interest rate ⇒ C of fin. integrated hhs ↑ ⇒ agg demand ↑

b Currency appreciation and expenditure switching

Expansionary Foreign Mon Pol Shock ⇒ Agg C↑, Appreciation, C Dispersion



a Lower intnl interest rate ⇒ C of fin. integrated hhs ↑ ⇒ agg demand ↑

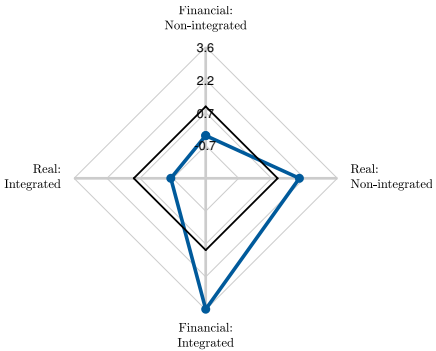
b Currency appreciation and expenditure switching

c Sizable dispersion: std. of individual C responses $\approx 3\times$ agg C response

Key Source of C Response Dispersion: International Integration

Share of C Dispersion Explained (%)	
Real integration	16.7
Financial integration	31.7
Net wealth	17.2
Idiosyncratic income	0.7

C Response: Integrated vs. Non-integrated

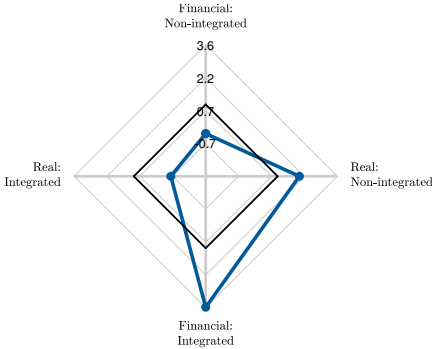


More details

Key Channel for C Response Dispersion: Exposure to Different Prices

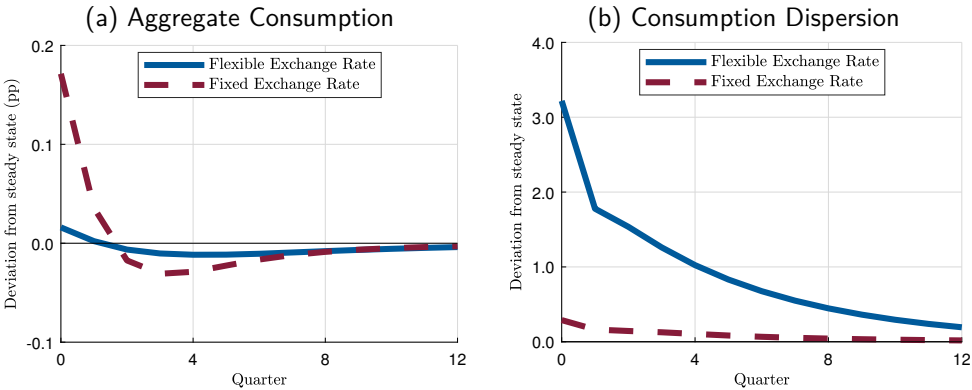
By Real Integration	Non-Int.	Integrated
C (relative to agg)	-0.47	3.99
Decomposition by Channels		
Real interest rate	**0.23**	**4.69**
Labor income	-0.59	-0.58
Others	-0.12	-0.12

C Response: Integrated vs. Non-integrated

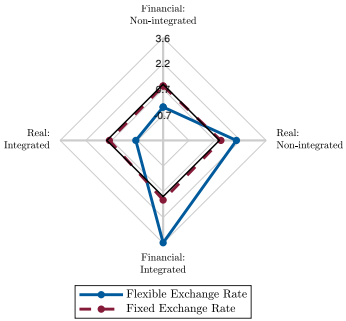


More details

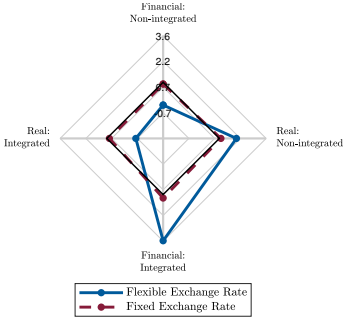
Exchange-rate Regimes: Trade-off btw Agg Stabilization & Inequality



Fixed ER: More Equal C Responses

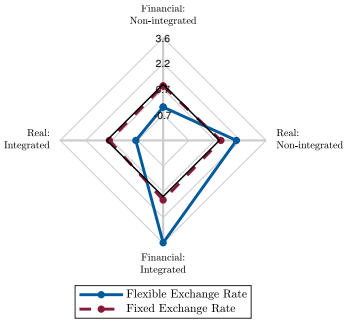


Fixed ER: More Equal C Responses due to Less Different W Responses



	Flexible		Fixed	
Real Integration	Non-Int.	Int.	Non-Int.	Int.
Cons (relative to agg)	-0.47	3.99	0.88	1.24
Decomposition by Channels				
Real interest rate	**0.23**	**4.69**	**0.47**	**0.83**
Labor income	-0.59	-0.58	0.17	0.17
Others	-0.12	-0.12	0.25	0.25

Fixed ER: More Equal C Responses due to Less Different W Responses



	Flexible		Fixed	
Real Integration	Non-Int.	Int.	Non-Int.	Int.
Cons (relative to agg)	-0.47	3.99	0.88	1.24
Decomposition by Channels				
Real interest rate	**0.23**	**4.69**	**0.47**	**0.83**
Labor income	-0.59	-0.58	0.17	0.17
Others	-0.12	-0.12	0.25	0.25

- Interest rate response diff. $\frac{\Delta(i^*+\mathbb{E}[d\mathcal{E}']-\mathbb{E}[\pi'])}{\Delta(i-\mathbb{E}[\pi'])}$: $\frac{-1.1\%}{-0.03\%} \approx \mathbf{36}$ vs. $\frac{-1.0\%}{-0.4\%} \approx \mathbf{3}$ ▸ Agg prices
- Fixed-rate regime:
  - Monetary authority lowers interest rate to avoid currency appreciation
  - Lower domestic interest rate stimulates fin. non-int. hhs' consumption

Extensions

Return

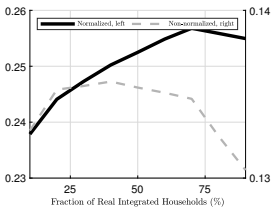
	Baseline	Endogenous Transition	International Pricing	Foreign Denomination	No Home Bias
			Domestic Monetary Shock		
Agg C	0.54	0.54	0.41	0.54	0.45
C Dispersion	0.24	0.25	0.56	0.24	0.34
Gap by Real Int.	0.08	0.09	0.83	0.10	-0.05
Gap by Fin. Int.	0.08	0.08	0.07	0.08	0.34
			Foreign Demand Shock		
Agg C	1.27	1.26	3.48	1.26	1.01
C Dispersion	0.95	0.91	1.36	0.99	1.36
Gap by Real Int.	-1.55	-1.48	-2.05	-1.60	-2.13
Gap by Fin. Int.	0.14	0.12	0.14	0.15	0.70
			Foreign Monetary Shock		
Agg C	0.02	0.02	0.03	0.02	0.12
C Dispersion	2.47	2.40	1.61	2.51	1.59
Gap by Real Int.	0.68	0.50	-0.75	0.71	0.86
Gap by Fin. Int.	-4.78	-4.63	-2.95	-4.83	-2.81

International Integrations

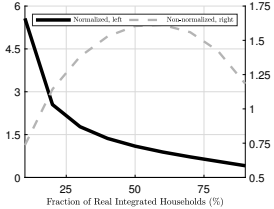
Return

Dispersion of Consumption Responses under Alternative Degrees of Real Integration

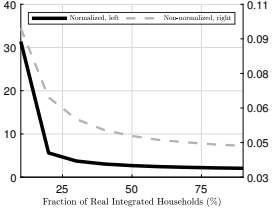
(a) Domestic Monetary Shock



(b) Foreign Demand Shock

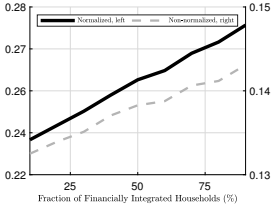


(c) Foreign Monetary Shock

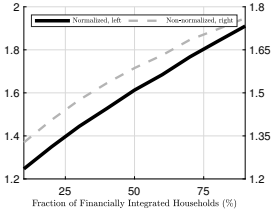


Dispersion of Consumption Responses under Alternative Degrees of Financial Integration

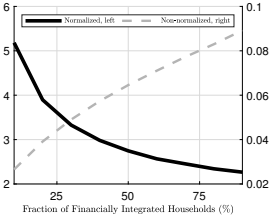
(d) Domestic Monetary Shock



(e) Foreign Demand Shock



(f) Foreign Monetary Shock

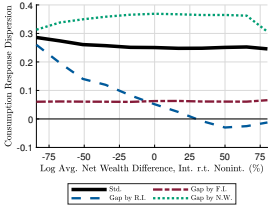


Correlation between International Integration and Wealth

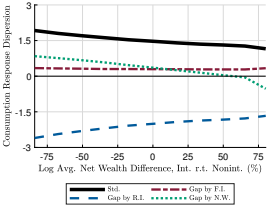
Return

Dispersion of Consumption Responses when Real Integration Correlates with Net Wealth

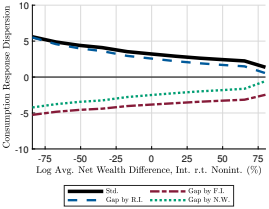
(a) Domestic Monetary Shock



(b) Foreign Demand Shock

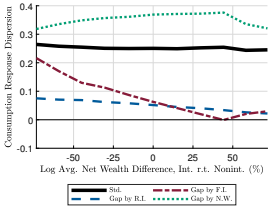


(c) Foreign Monetary Shock

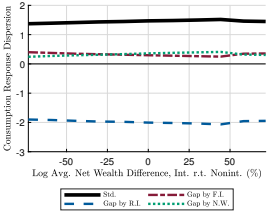
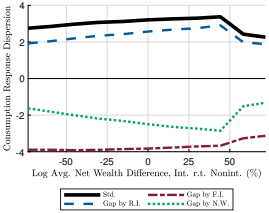


Dispersion of Consumption Responses when Financial Integration Correlates with Net Wealth

(d) Domestic Monetary Shock



(e) Foreign Demand Shock



(f) Foreign Monetary Shock