λ	ρ_R	α_π	α_y	$\alpha_{\Delta y}$	τ	ω
			Superinertial rule			
0.25	1.2987	0.0313	0.0022	0.0166	0.3405	0.0491
1.1769	5	1.5372	0.0150	0.9426	0.0700	0.0196
∞	5	4.1027	0.0000	0.0000	0.0000	0.4024
			Implementable rule			
0.25	1	0.0595	0.0000	\	0.5590	0.0727
1.1769	1	0.1177	0.0000	\	0.2248	0.0857
∞	1	0.4618	0.0000	\	0.0000	0.5945

Table 6: Robustness to alternative optimized monetary policy rule

becomes more mobile; ii) the welfare losses with respect to the Ramsey policy are smaller with respect to the price-level rules; iii) crucially, the negative relationship between labor mobility and the optimal weight on durables inflation survives.

We then replace rule (33) with an interest rate rule that responds only to inflation and the deviation of output from its steady state. Following Schmitt-Grohe and Uribe (2007) this type of interest rate rule is typically labelled *implementable rule* and, after the appropriate reparametrization, reads as follows:

$$\log\left(\frac{R_t}{\bar{R}}\right) = \rho_r \log\left(\frac{R_{t-1}}{\bar{R}}\right) + \alpha_\pi \log\left(\frac{\tilde{\Pi}_t}{\tilde{\Pi}}\right) + \alpha_y \log\left(\frac{Y_t}{\bar{Y}}\right), \tag{36}$$

where $\alpha_\pi \equiv (1-\rho_r)\,\rho_\pi$, $\alpha_y \equiv (1-\rho_r)\,\rho_y$. The lower panel of Table 6 demonstrates that despite these modifications, the choice towards a price-level rule and the inverse relationship between labor mobility and the optimal weight on durables inflation still hold true. In addition, the implied welfare losses are similar to the baseline model.

5 Conclusion

As the New-Keynesian literature on two-sector models has demonstrated, setting the appropriate weights to sectoral inflations is a crucial task for a central bank in order to achieve its objectives. We look at this issue from an angle the literature has so far overlooked. In particular, we study the relation between the degree of sectoral labor mobility and the optimal weight the central bank should assign to inflation in the sector with relatively more flexible prices (durables). We first estimate the model with Bayesian methods and find evidence of a limited sectoral labor mobility. Then, we exploit the estimated model to perform optimal monetary policy analysis. Under the Ramsey policy, the optimal responses to structural shocks are significantly altered by different degrees of sectoral labor mobility. Preventing labor from moving freely between sectors dramatically changes the optimal path of the policy rate, thus leading to different effects on sectoral and aggregate variables, as well as on welfare.

We then let the central bank optimize the parameters of a simple monetary policy rule along with the weight on inflation in the durables sector for different degrees of labor mobility. Our main result is that conditional on the intensity of price stickiness in the durables sector, an inverse relationship between labor mobility and the optimal weight on the sector with relatively more flexible prices arises: a lower weight is assigned to durables inflation as the degree of labor mobility increases. Intuitively, with more mobile labor, adjustments to shocks easily occur through quantities (via the reallocation of labor itself) rather than prices, and the the central bank finds it optimal to focus more on the sector with the higher price stickiness.

Wage stickiness also plays an important role on the optimal weight of durables inflation. Via the pass-through on marginal costs it always implies a higher weight on durables inflation with respect to the case of flexible wages. In the design of optimal monetary policy, we also find that the central bank chooses to implement a price-level rule by introducing desirable history dependence in the model to reduce the volatility of prices, thus confirming results the literature has found in one-sector models.

These results are confirmed by various robustness checks and point to a non-negligible role of sectoral labor mobility for the conduct of monetary policy.

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Appendix

A Data

We define the durables sector as the a composite of durable goods and residential investments whereas the nondurables sector comprises nondurables goods and services.

Series	Definition	Source	Mnemonic
DUR^N	Nominal Durable Goods	BEA	Table 2.3.5 Line 3
RI^N	Nominal Residential Investment	BEA	Table 1.1.5 Line 13
ND^N	Nominal Nondurable Goods	BEA	Table 2.3.5 Line 8
S^N	Nominal Services	BEA	Table 2.3.5 Line 13
P_{DUR}	Price Deflator, Durable Goods	BEA	Table 1.1.9 Line 4
P_{RI}	Price Deflator, Residential Investment	BEA	Table 1.1.9 Line 13
P_{ND}	Price Deflator, Nondurable Goods	BEA	Table 1.1.9 Line 5
P_S	Price Deflator, Services	BEA	Table 1.1.9 Line 6
Y^N	Nominal GDP	BEA	Table 1.1.5 Line 1
P_Y	Price Deflator, GDP	BEA	Table 1.1.9 Line 1
FFR	Effective Federal Funds Rate	FRED	FEDFUNDS
N	Nonfarm Business Sector: Average Weekly Hours	FRED	PRS85006023
W	Nonfarm Business Sector: Compensation Per Hour	FRED	COMPNFB
POP	Civilian Non-institutional Population, over 16	FRED	CNP16OV
CE	Civilian Employment, 16 over	FRED	CE16OV

Table A.1: Data Sources

A.1 Durables and Residential Investments

1. Sum nominal series: $DUR^N + RI^N = DR^N$
2. Calculate sectoral weights of deflators: $\omega^D = \frac{DUR^N}{DR^N}$; $\omega^{RI} = \frac{RI^N}{DR^N}$
3. Calculate Deflator: $P_D = \omega^D P_{DUR} + \omega^{RI} P_{RI}$

4. Calculate Real Durable Consumption: $D = \frac{DUR^N + RI^N}{P_D}$

A.2 Nondurables and Services

1. Sum nominal series: $ND^N + S^N = NS^N$
2. Calculate sectoral weights of deflators: $\omega^{ND} = \frac{ND^N}{NS^N}$; $\omega^S = \frac{S^N}{NS^N}$
3. Calculate Deflator: $P_C = \omega^{ND} P_{ND} + \omega^S P_S$
4. Calculate Real Nondurable Consumption: $C = \frac{ND^N + S^N}{P_C}$

A.3 Data transformation for Bayesian estimation

Variable	Description	Construction
POP_{index}	Population index	$\frac{POP}{POP_{2009:1}}$
CE_{index}	Employment index	$\frac{CE}{CE_{2009:1}}$
Y^o	Real per capita GDP	$\ln\left(\frac{\frac{Y^N}{P_Y}}{POP_{index}}\right)100$
I_D^o	Real per capita consumption: durables	$\ln\left(\frac{D}{POP_{index}}\right)100$
C^o	Real per capita consumption: nondurables	$\ln\left(\frac{C}{POP_{index}}\right)100$
W^o	Real wage	$\ln\left(\frac{W}{P_Y}\right)100$
N^o	Hours worked per capita	$\ln\left(\frac{H \times CE_{index}}{POP_{index}}\right)100$
Π_C^o	Inflation: nondurables sector	$\Delta(\ln P_C)100$
Π_D^o	Inflation: durables sector	$\Delta(\ln P_D)100$
R^o	Quarterly Federal Funds Rate	$\frac{FFR}{4}$

Table A.2: Data transformation - Observables

B Symmetric equilibrium

$$X_t = Z_t^{1-\alpha} D_t^{\alpha} \quad (37)$$

$$Z_t = C_t - \zeta S_{t-1} \quad (38)$$

$$S_t = \rho_c S_{t-1} + (1-\rho_c) C_t \quad (39)$$

$$U\left(X_t, N_t\right) = log\left(X_t\right) - \nu \frac{N_t^{1+\varphi}}{1+\varphi} \quad (40)$$

$$U_{Z,t} = \frac{(1-\alpha)}{Z_t} \quad (41)$$

$$U_{D,t} = \frac{\alpha}{D_t} \quad (42)$$

$$U_{N,t} = -\nu N_t^{\varphi} \quad (43)$$

$$N_t = \left[\left(\chi^C\right)^{-\frac{1}{\lambda}} \left(N_t^C\right)^{\frac{1+\lambda}{\lambda}} + \left(1-\chi^C\right)^{-\frac{1}{\lambda}} \left(N_t^D\right)^{\frac{1+\lambda}{\lambda}}\right]^{\frac{\lambda}{1+\lambda}} \quad (44)$$

$$N_t^C = \chi^C \left(\frac{w_t^C}{w_t}\right)^{\lambda} N_t \quad (45)$$

$$N_t^D = \chi^D \left(\frac{w_t^D}{w_t}\right)^{\lambda} N_t \quad (46)$$

$$\Lambda_{t,t+1} \equiv \beta \frac{U_{Z,t+1}}{U_{Z,t}} \frac{e_{t+1}^B}{e_t^B} \quad (47)$$

$$\begin{aligned} \left[1 - e_t^W \eta\right] + \frac{e_t^W \eta}{\tilde{\mu}_t} &= \vartheta^W \left(\Pi_t^W - \Pi^C\right) \Pi_t^W + \\ &+ E_t \left[\Lambda_{t,t+1} \vartheta^W \left(\Pi_{t+1}^W - \Pi^C\right) \Pi_{t+1}^W \frac{w_{t+1} N_{t+1}}{w_t N_t}\right] \end{aligned} \quad (48)$$

$$\tilde{\mu}_t = -\frac{U_{Z,t}}{U_{N,t}} w_t \quad (49)$$

$$Q_t \psi_t = \frac{U_{D,t}}{U_{Z,t}} + (1-\delta) E_t \left[\Lambda_{t,t+1} Q_{t+1} \psi_{t+1}\right] \quad (50)$$

$$\begin{aligned} 1 &= \psi_t e_t^I \left[1 - S\left(\frac{I_t^D}{I_{t-1}^D}\right) - S'\left(\frac{I_t^D}{I_{t-1}^D}\right) \frac{I_t^D}{I_{t-1}^D}\right] + \\ &+ E_t \left\{\Lambda_{t,t+1} \psi_{t+1} \frac{Q_{t+1}}{Q_t} e_{t+1}^I \left[S'\left(\frac{I_{t+1}^D}{I_t^D}\right) \left(\frac{I_{t+1}^D}{I_t^D}\right)^2\right]\right\} \end{aligned} \quad (51)$$

$$S\left(\frac{I_t^D}{I_{t-1}^D}\right) = \frac{\phi}{2}\left(\frac{I_t^D}{I_{t-1}^D}-1\right)^2 \tag{52}$$

$$S'\left(\frac{I_t^D}{I_{t-1}^D}\right) = \phi\left(\frac{I_t^D}{I_{t-1}^D}-1\right) \tag{53}$$

$$1 = E_t\left[\Lambda_{t,t+1}\frac{R_t}{\Pi_{t+1}^C}\right] \tag{54}$$

$$\Pi_t^D = \Pi_t^C\frac{Q_t}{Q_{t-1}} \tag{55}$$

$$\Pi_t^W = \frac{w_t}{w_{t-1}}\widetilde{\Pi}_t \tag{56}$$

$$Y_t^C = e_t^A N_t^C \tag{57}$$

$$Y_t^D = e_t^A N_t^D \tag{58}$$

$$\begin{aligned}\left(1-e_t^C\epsilon_c\right)+e_t^C\epsilon_c MC_t^C &= \vartheta_c\left(\Pi_t^C-\Pi^C\right)\Pi_t^C- \\ &\quad -\vartheta_c E_t\left[\Lambda_{t,t+1}\frac{Y_{t+1}^C}{Y_t^C}\left(\Pi_{t+1}^C-\Pi^C\right)\Pi_{t+1}^C\right]\end{aligned} \tag{59}$$

$$MC_t^C = \frac{w_t}{e_t^A} \tag{60}$$

$$\begin{aligned}\left(1-e_t^D\epsilon_d\right)+e_t^D\epsilon_d MC_t^D &= \vartheta_d\left(\Pi_t^D-\Pi^D\right)\Pi_t^D- \\ &\quad -\vartheta_d E_t\left[\Lambda_{t,t+1}\frac{Q_{t+1}}{Q_t}\frac{Y_{t+1}^D}{Y_t^D}\left(\Pi_{t+1}^D-\Pi^D\right)\Pi_{t+1}^D\right]\end{aligned} \tag{61}$$

$$MC_t^D = \frac{w_t}{e_t^A Q_t} \tag{62}$$

$$\widetilde{\Pi}_t = \left(\Pi_t^C\right)^{1-\tau}\left(\Pi_t^D\right)^{\tau} \tag{63}$$

$$\log\left(\frac{R_t}{\bar{R}}\right) = \left[\rho_\pi\log\left(\frac{\Pi_t}{\bar{\Pi}}\right)+\rho_y\log\left(\frac{Y_t}{\bar{Y}}\right)\right]+e_t^M \tag{64}$$

$$Y_t^C = C_t+e_t^G+\frac{\vartheta_c}{2}\left(\Pi_t^C-\Pi^C\right)^2Y_t^C \tag{65}$$

$$Y_t^D = \left[D_t-(1-\delta)D_{t-1}\right]+\frac{\vartheta_d}{2}\left(\Pi_t^D-\Pi^D\right)^2Y_t^D \tag{66}$$

$$Y_t = Y_t^C+Q_tY_t^D+\frac{\vartheta^W}{2}\left(\Pi_t^W-\Pi^C\right)^2w_tN_t \tag{67}$$

C Steady state

In the deterministic steady state all expectation operators are removed and for each variable it holds that $x_t = x_{t+1} = x$. Moreover, the stochastic shocks are absent. The steady-state inflation rate in the nondurables sector is the optimal under the Ramsey policy and is denoted by Π^C_{opt} . C solves equation (65) whereas all other variables can be found recursively from the following relationships:

$$\Pi^D = \Pi^C_{\text{opt}} \tag{68}$$
$$\tilde{\Pi} = \Pi^C_{\text{opt}} \tag{69}$$
$$\Pi^W = \Pi^C_{\text{opt}} \tag{70}$$
$$\Lambda = \beta \tag{71}$$
$$R = \frac{1}{\beta} \tag{72}$$
$$MC^C_t = \frac{\epsilon_c - 1}{\epsilon_c} \tag{73}$$
$$w^C = MC^C e^A \tag{74}$$
$$w^D = w^C \tag{75}$$
$$w = w^D \tag{76}$$
$$MC^D_t = \frac{\epsilon_d - 1}{\epsilon_d} \tag{77}$$
$$Q = \frac{w^D}{MC^D e^A} \tag{78}$$
$$S = 0 \tag{79}$$
$$S' = 0 \tag{80}$$
$$\psi = 1 \tag{81}$$
$$\tilde{\mu} = \frac{\eta}{\eta - 1} \tag{82}$$
$$S = C \tag{83}$$
$$Z = (1 - \zeta)\, C \tag{84}$$
$$U_Z = \frac{(1 - \alpha)}{Z} \tag{85}$$
$$U_D = U_z Q \psi \left[1 - (1 - \delta)\, \beta\right] \tag{86}$$
$$D = \frac{\alpha}{U_D} \tag{87}$$