Are transfer payments stimulative? - Sometimes*

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Abstract

This paper investigates the stimulative effects of transfer payments on personal income and gross domestic product using impulse response functions and forecast error variance decomposition in state-dependent time series econometric models. It is shown that under symmetric response assumptions, positive transfer payment impulses lead to positive and relatively long-lasting effects on personal income and gross domestic product. However, when an asymmetry linked to economic conditions is used, it is found that transfer payment effects are asymmetric and have significant positive effects on personal income and gross domestic product during times of economic weakness but are not very stimulative during strong economic times. A deeper analysis shows that this result is not due to unemployment insurance transfers but is mostly due to the recent special programs undertaken during the Great Recession and the more recent COVID-19 recession. These results indicate that policy which uses transfer payments as economic stimulus for the economy during expansionary economic conditions will not lead to large gains in personal income and gross domestic product. Furthermore, policy expansions for unemployment benefits do not result in large economic regardless of the economic conditions. The primary stimulative benefit to personal income and gross domestic product from transfer payment policy expansions comes from special programs enacted during contractionary economic conditions.

JEL Codes: E21, E62, H55

Keywords: Transfer payments, local projection, state-dependent time series econometric model

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This paper investigates the stimulative effects of transfer payments on personal income and gross domestic product using impulse response functions and forecast error variance decomposition in state-dependent time series econometric models. It is shown that under symmetric response assumptions, positive transfer payment impulses lead to positive and relatively long-lasting effects on personal income and gross domestic product. However, when an asymmetry linked to economic conditions is used, it is found that transfer payment effects are asymmetric and have significant positive effects on personal income and gross domestic product during times of economic weakness but are not very stimulative during strong economic times. A deeper analysis shows that this result is not due to unemployment insurance transfers but is mostly due to the recent special programs undertaken during the Great Recession and the more recent COVID-19 recession. These results indicate that policy which uses transfer payments as economic stimulus for the economy during expansionary economic conditions will not lead to large gains in personal income and gross domestic product. Furthermore, policy expansions for unemployment benefits do not result in large economic regardless of the economic conditions. The primary stimulative benefit to personal income and gross domestic product from transfer payment policy expansions comes from special programs enacted during contractionary economic conditions.

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1 Introduction

U.S. Government transfer payments are a significant federal expenditure, making up about 40 percent of total spending. Most transfer payment programs are motivated by their benefits to the recipients of the payments, but their effects on the macroeconomy are also important. A considerable body of research has focused on how total government spending affects the economy.[1] More recently, the effects of transfer payments in isolation have garnered attention.[2] Here, we also study the impact of transfer payments on the macro economy using modern time series econometric methods to tease out the macroeconomic consequences of transfer payment impulses.[3] We further investigate whether there are asymmetric effects of transfer payments where the asymmetry depends on the state of the business cycle. In addition, we apply these methods to several subseries of the transfer payment series to isolate the origin of the transfer payment macroeconomic effects. Using broadly defined transfer payment data, we do find stimulative effects from transfer payments, particularly during times of economic weakness. However, the subseries analysis shows that most of these stimulative effects are due to one particular subseries which includes many of the special programs initiated during the two most recent economic downturns. Removing that subseries from the broad transfer payment series, or focusing on data prior to the Great Recession, shows that positive transfer payment impulses have much smaller positive effects and are not as asymmetric over the course of the business cycle.

To provide some background and insight for understanding these results, Figure 1 plots several series, including Personal Current Transfer Receipts (PCTR), which is the total amount of transfer payments, Personal Current Transfer Receipts - Other (PCTROTHER), which is a subseries of PCTR and is a catch-all residual category that includes transfer payment programs that do not fit into one of the main categories, and Personal current transfer receipts - Government social benefits to persons: Unemployment insurance (PCTRUNIN).[4] Prior to the

[1] These effects were central to the older Keynesian models. More recent New Classical models questioned these effects and modern time series econometric methods have sought to resolve these differences. Notable recent contributions include Blanchard and Perotti (2002), Perotti (2007), Mountford and Uhlig (2009), Barro and Redlick (2011), Ramey (2011a,b), Auerbach and Gorodnichenko (2012a,b, 2013), Ramey and Zubairy (2018) and Auerbach et al. (2022).

[2] Romer and Romer (2016), and Rodríguez (2018) use a narrative approach to isolate transfer payment shocks and study the consequences of these shocks.

[3] Time series methods have some advantages over narrative methods, which tend to focus on a few expansionary events, because the time series methods use information from the full spectrum of transfer payment experiences to determine their consequences.

[4] These quarterly data series were obtained from the Federal Reserve Bank of St. Louis (FRED) data bank. The abbreviations given in parenthesis are the notations used in FRED. These series are reported in nominal form

2008 Great Recession, the series had fairly stable trends. However, significant transfer payment expansionary programs were implemented during the Great Recession and the COVID-19 recession. These programs included the American Recovery and Reinvestment Act (ARRA) of 2009, the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020, and the Consolidated Appropriations Act of 2021, and can be seen as the large spikes in transfer payments during each of the economic downturns.[5] It is these spikes which largely account for the asymmetry in the macroeconomic effects of transfer payments. Since the spikes are a recent phenomena, isolating the analysis to data prior to the fourth quarter of 2007, results in no asymmetry.

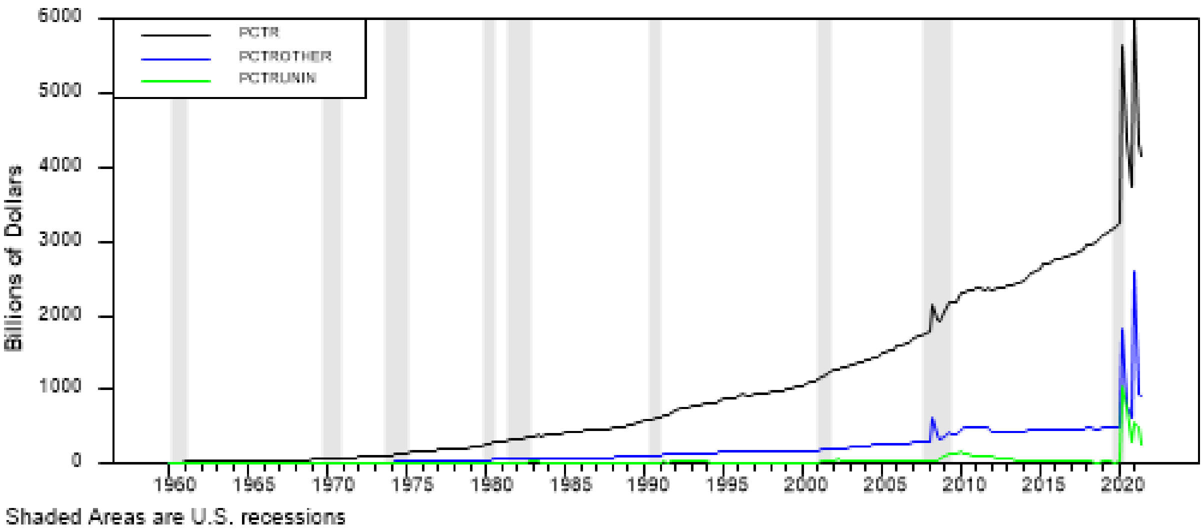

Figure 1: Personal current transfer receipts and selected subseries

Also notable in Figure 1 is that the spikes for PCTR are almost entirely due to the spikes in the two subseries PCTROTHER and PCTRUNIN, so subseries analysis proved to be useful for teasing out the source of the effects. Like the primary series, PCTR, the subseries PCTROTHER produces strong asymmetric macroeconomic responses. Interestingly, PCTRUNIN does not produce either strong positive responses or asymmetries. We interpret this result

and for our analysis, the data was left in that form. Other subseries for PCTR include, Personal current transfer receipts - Government social benefits to persons: Social Security (W823RC1), Personal current transfer receipts - Government social benefits to persons: Medicare (W824RC1), Personal current transfer receipts: Government social benefits to persons - Medicaid (W729RC1), and Personal current transfer receipts: Government social benefits to persons - Veterans' benefits (W826RC1). These four components exhibit smooth growth and were not included in Figure 1 to preserve clarity for the series of interest.

[5] Related work includes Chodorow-Reich et al. (2012) who study the impact of ARRA on state Medicaid programs and the implications for employment. Oh and Reis (2012) also focus on the Great Recession stimulus, but with a broader focus than just the US program and Kim (2021) focus on the Korean stimulus to these recent events.

to arise from the automatic nature of unemployment insurance which tends to commove with macroeconomic variables as part of the business cycle, thus not producing much of an independent effect on its own. So, despite the large spikes in unemployment insurance during the COVID-19 recession, these spikes were largely consistent with the sizes of the economic declines so as to not to imply an asymmetric effect the way PCTROTHER did. Finally, subtracting the subseries PCTROTHER from PCTR removes most of the spikes from the recessionary programs and running the analysis on that constructed subseries shows no asymmetry and only small stimulative effects from positive impulses.

Our analysis uses modern time series econometric methods, including impulse response functions (IRF) and forecast error variance decompositions (FEVD). We investigate both symmetric and asymmetric models. For the asymmetric models, we base the asymmetry on the Sahm (2019) rule economic series, which is an indicator series designed to capture the strength of the economy over the business cycle.[6] Because of its flexibility for asymmetric model applications, we use the local projection method described in Jordà (2005) to compute these IRF and FEVD under the different economic conditions. These methods are well suited for state-dependent time series models and have advantages over the traditional Vector Autoregression (VAR) methods, and have been applied in similar settings by Auerbach and Gorodnichenko (2012a,b, 2013, 2016), Ramey and Zubairy (2018), Owyang et al. (2013), Ahmed and Cassou (2016, 2021), and Ahmed et al. (2022).

There are several policy implications for these results. First, these results indicate that using transfer payments as economic stimulus for the economy during expansionary economic conditions does not lead to large gains in personal income and gross domestic product. Second, expansions in unemployment benefits do not result in large gains in personal income and gross domestic product regardless of the economic conditions. The primary stimulative benefit to personal income and gross domestic product from transfer payments expansions comes from special programs that are enacted during contractionary economic conditions, such as those enacted during the Great Recession and the COVID-19 recession.

The paper is organized as follows. Section 2 describes the empirical methods. Section 3 presents the results for the PCTR series and undertakes a deeper analysis of the subseries to determine the origin of the results. Section 4 undertakes some robustness exercises, including

[6] The original purpose of the Sahm rule was to provide a signal that could be used to automatically provide stimulus payments when the economy weakens. However, the rule has proved to be useful for other purposes, such as ours here, as it is a good indicator of economic strength.

using alternative measures for economic weakness and introducing a monetary policy variable into the model.

2 Empirical methodology

The baseline empirical models use three variables, Personal Income (PI), Gross Domestic Product (GDP), and either total transfer payments (PCTR) or a subseries of total transfer payments, denoted as pi_t, y_t, and tr_t respectively in the time series model below. For models using the full set of data, the series are quarterly series from 1960:01 to 2021:03 and were obtained from the Federal Reserve Bank of St. Louis (FRED) data bank. The various transfer payment series used in this study include the three plotted series in Figure 1, while the PI and GDP data were also downloaded from FRED and the abbreviations used here are the same as those used by FRED. The transfer payment series are reported in nominal terms, and we preserved those measurement units. This means that the PI and GDP data were also used in nominal form to ensure consistency. Dividing each series by a price index such as the GDP deflator does not change the results.

We consider two types of empirical models. The first is a simple linear or symmetric model with no threshold or switching behavior. Because a comparison between symmetric and asymmetric models is undertaken, we use the local projection method suggested by Jordà (2005) because of its ease of application for state-dependent time series models.[7] We begin by describing how to apply this method to a symmetric model and then later extend it to the threshold situation.

The local projection method produces IRFs by running a series of forecast models given by

$$x_{t+s} = \alpha^s + \sum_{i=1}^{p} B_i^{s+1} x_{t-i} + \varepsilon_{t+s}^s \qquad s = 0, 1, ..., h, \tag{1}$$

where $x_t = [pi_t \quad tr_t \quad y_t]'$ is a vector of the model variables which we wish to forecast s steps ahead for h different forecast horizons using a forecasting model consisting of p lags of the variables in the system. The parameter notations in the model are commonly used, with α^s

[7] In discussing the IRF, we use the traditional interpretation that these represent how variables respond to one unit impulses in a structural shock. An alternative interpretation for the impulse response function under a Cholesky ordering is to note that it is the revision to the conditional forecast for a variable due to a one standard deviation impulse in one of the structural shocks. See Hamilton (1994) pages 318-23 for this approach. To avoid confusion, we stick to the traditional interpretation here.

denoting a 3 × 1 vector of constants, and B_i^{s+1} denoting 3 × 3 square matrices of parameters corresponding to the ith lag, x_{t-i}, in the s step ahead forecasting model, and ε^s_{t+s} is a moving average of the forecast errors from time t to time $t+s$. As noted by Jordà (2005), the local projection technique is robust to situations with nonstationary or cointegrated data, so this application, which uses level data, will have no issues.

Jordà (2005) shows that IRFs generated by the local projections are equivalent to those calculated from VAR methods when the true data generating process (DGP) is a VAR, but that the IRFs for other DGPs that are not true VARs are better estimated using this local projection method. The IRFs are defined as

$$\widehat{IR}(t, s, d_i) = B_1^s d_i \qquad\qquad s = 0, 1, ..., h \tag{2}$$

where $B_1^0 = I$, and d_i is an n × 1 column vector that contains the mapping from the structural shock for the ith element of x_t to the experimental shocks.[8] We construct this mapping matrix using methods suggested by Jordà (2005), which essentially follows methods used in the traditional VAR literature and begins by estimating a linear VAR and applying a Cholesky decomposition to the variance-covariance matrix. For our baseline ordering, we assumed that GDP can contemporaneously affect transfer payments, but not the other way.[9] We also assumed that both GDP and transfer payments can contemporaneously affect PI while PI has no contemporaneous effect on the other series. This resulted in PI ordered last, transfer payments second, and GDP first. However, alternative orderings discussed in the robustness section, were also investigated.

Next, using the local projection technique, one can compute confidence bands using estimates of the standard deviations for the impulses. One issue that needs to be recognized in doing this is that because the DGP is unknown, there could be serial correlation in the error term of (1) induced by the successive leads of the dependent variable. We address this issue by using Newey and West (1987) standard errors which correct for heteroskedasticity and autocorrelation (HAC). Letting, $\widehat{\sum}_s$ be the estimated HAC corrected variance-covariance matrix of the coefficients $\widehat{B}_1^s$, a 68% (or a one standard deviation) confidence interval for each element of the IRF at horizon s can be constructed by $\widehat{IR}(t, s, d_i) \pm \sigma(d_i^{\prime} \widehat{\sum}_s d_i)$, where σ is a n × 1 column

[8]Here, we use Jordà's experimental shock terminology, but the terminology reduced form shock is also appropriate.

[9]This assumption reflects the automatic stabilizer nature of many transfer payment programs.

vector of ones.

Our extension of the baseline model is to incorporate threshold behavior to the impulse response structure that allows the possibility that the IRF may differ depending on whether the economy is in a recession or not. We define our extension to (1) by

$$x_{t+s} = I_{t-1}\left[\alpha_R^s + \sum_{i=1}^{p} B_{i,R}^{s+1} x_{t-i}\right] + (1 - I_{t-1})\left[\alpha_E^s + \sum_{i=1}^{p} B_{i,E}^{s+1} x_{t-i}\right] + \varepsilon_{T,t+s}^s \qquad s = 0, 1, ..., h \quad (3)$$

where most of the notation carries over from above, but subscripts of R or E have been added to the various parameters to indicate whether the economy is in a recession or an expansion, respectively, and we use a different notation of $\varepsilon_{T,t+s}^s$ to denote the error process for this model where the added subscript indicates the error for the threshold model. The threshold dummy variable, denoted by I_t and defined more completely below, indicates the distinction between recessionary and expansionary economic conditions.

By analogy to (3), we define the IRFs for the two states of the economy by

$$\widehat{IR}^R(t, s, d_i) = B_{1,R}^s d_i \qquad s = 0, 1, ..., h \quad (4)$$

and

$$\widehat{IR}^E(t, s, d_i) = B_{1,E}^s d_i \qquad s = 0, 1, ..., h \quad (5)$$

with normalizations $B_{1,R}^0 = I$ and $B_{1,E}^0 = I$. The confidence bands for the impulse responses of the threshold model are simple extensions of the methodology discussed above.

Our baseline threshold indicator is based on the Sahm's rule described in Sahm (2019). Sahm's rule identifies real-time signals related to changes in the business cycle based on whether the three-month moving average of the unemployment rate rises by 0.50 percentage point or more relative to its low during the past twelve months. Based on this rule, we constructed our policy switches according to

$$I_{t-1} = \begin{cases} 1 & \text{for } S_{t-1} \geq 0.5 \\ 0 & \text{for } S_{t-1} < 0.5 \end{cases} \quad (6)$$

where we use S_t to denote Sahm's data series. An alternative indicator is to use the NBER recession date series. We explore this as well as a number of other things in the robustness section below. There we show that Sahm's rule works better for our exercise as the rule is by construction a real-time series and is better at anticipating changes in the business cycle than the NBER recession date series.

Finally, we conclude this section by noting that the primary advantage of the local projection method over the standard VAR approach is that each forecast horizon is computed separately from the others so that it can handle richer econometric specifications. This can be understood by reviewing the IRF computation from the typical VAR model. The VAR approach uses the VAR parameters to generate the moving average form from which the IRFs are generated at each horizon. Thus, the IRFs at all horizons are directly connected to these VAR parameters. On the other hand, the local projection method computes the IRFs from a different forecast equation (here (1) or (3)), and thus the structure of the IRFs can vary over the horizon. This allows flexibility when the DGP is nonlinear. So for instance, if the DGP is given by the highly nonlinear structure in (3), the linear VAR structure will not be able to handle this as well as the local projection approach which imposes less structure on the IRF. The local projection method is also attractive relative to methods proposed by Auerbach and Gorodnichenko (2012b).[10] In the Smooth Transition Vector Autoregression (STVAR) approach suggested by Auerbach and Gorodnichenko (2012b), it is assumed that the economy stays in the current state over the horizon in which the impulse responses are calculated. For example, Ramey and Zubairy (2018) argue that this type of assumption is inconsistent with the fact that the average NBER recession period typically lasts 3.3 quarters, much shorter than the horizons over which one estimates the IRFs. On the other hand, the local projection approach estimates parameters that are based on data that can be in either state of the world. Thus, these parameters have an averaging effect, and the projections based on these estimates can be interpreted as weighted averages of the two separate state IRFs.

3 Results

Since our interest is transfer payments' impact on other economic variables, we only present the responses to transfer payment impulses. Figure 2 shows the linear model and the threshold model impulse responses in a side-by-side set of plots, with the linear model results on the left side and the threshold model on the right side. For the linear model, we plot several things

[10] See Ramey and Zubairy (2018), for details. Also see Auerbach and Gorodnichenko (2013, 2016).

in each subplot, including the actual impulse response indicated by a gray line, a sixty-eight percent standard error band, given by the dark blue region and a ninety percent standard error band given by the additional light blue region.[11] Focusing on the bottom row of the linear model, we see that a one percent impulse to transfer payments is relatively long lived, remaining significantly different from zero even after twelve quarters. Next, looking at the top and middle rows, we see that the responses to the transfer payment impulses on PI and GDP are positive and somewhat long lasting, remaining significantly different from zero for six to seven quarters.

Next, focusing on the threshold model in the right panel, we see that the economic state becomes important. To interpret these plots, we have arranged them in the same order as in the linear model. Furthermore, for each subplot, the results for the expansionary economic state and the contractionary economic state, as governed by the Sahm's rule, are plotted. To distinguish between the two states, we use the convention of plotting the contractionary state using the same shading convention as the linear model, while for the expansionary state, we plot the responses using a solid black line and then the same two standard error bands are marked with dashed black lines with the narrow set of dashed lines representing the sixty-eight percent band and the wider set representing the ninety percent band. The bottom row again shows that a one percent impulse to transfer payments is relatively long lived in both expansionary and contractionary states. Furthermore, transfer payment responses follow similar and mostly overlapping patterns for both the expansionary and contractionary states. However, the effects of the impulse on PI and GDP are quite different and depend on whether one is in an expansionary or recessionary state. Both top rows show that during the contractionary state, the transfer payment impulse has a significantly positive effect on both PI and GDP for the entire twelve-quarter horizon. Furthermore, during the expansionary state, there are smaller positive and significant responses for about the first six quarters and then the responses become insignificant, like they did in the linear model. Similar state-dependent results were found by Auerbach et al. (2022) for Department of Defense spending during the Covid-19.

3.1 The origin of the asymmetry

The U.S. Bureau of Economic Analysis decomposes the Personal Current Transfer Receipts series into seven subseries. Refining the analysis to focus on these subseries can reveal much about

[11] A popular convention is to only present the sixty-eight percent, or one standard error bands.

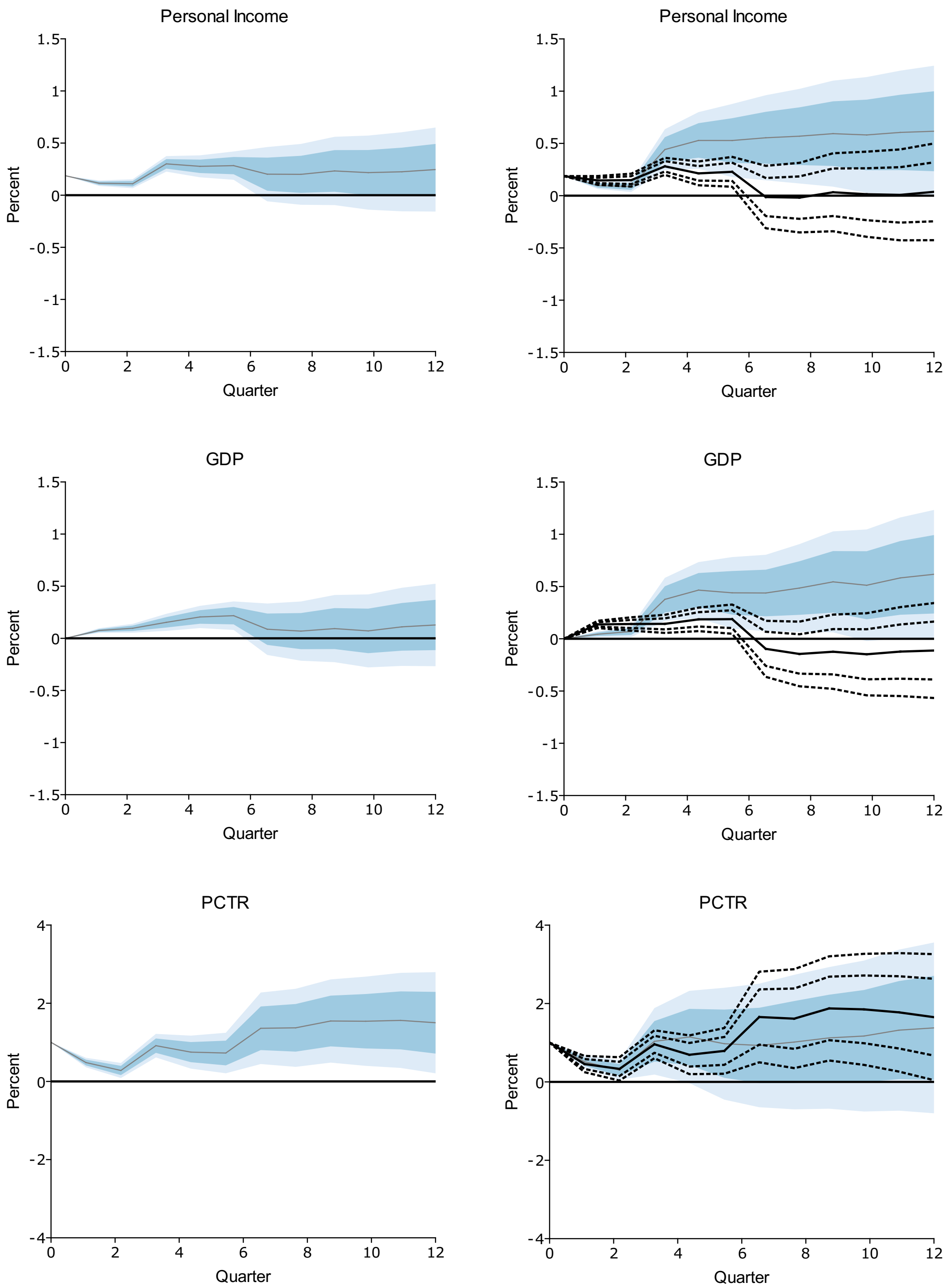

Figure 2: Response function to PCTR impulse

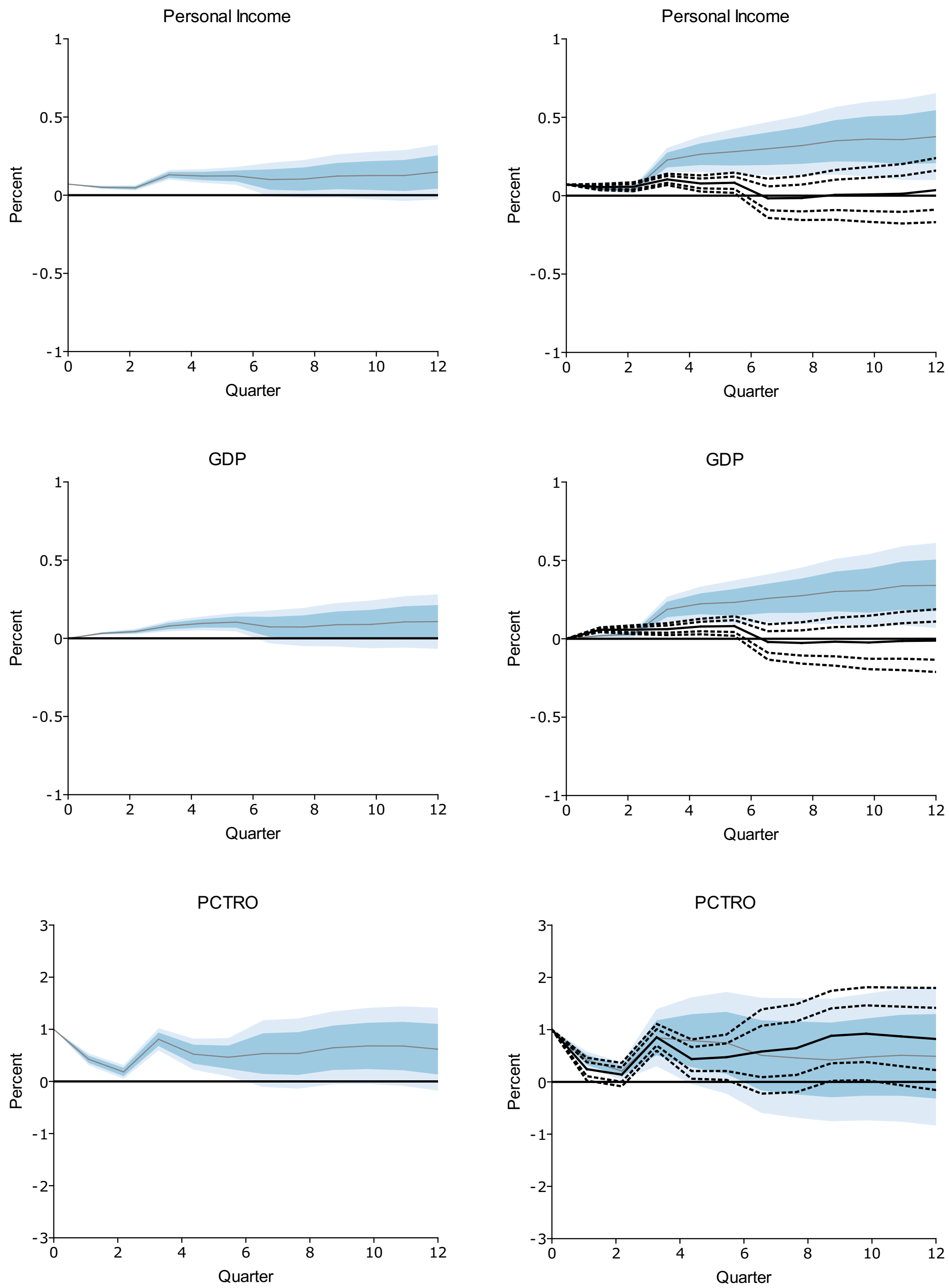

Figure 3: Response function to PCTRO impulse

the origin of the asymmetry seen in Figure 2. In Figure 1, we highlighted two subseries which also have rather pronounced spikes during recessionary periods. These include PCTROTHER, which we have shortened to PCTRO in the graphs and tables below, and PCTRUNIN.[12] Figures 3 - 5 show impulse responses to one percent impulses in three different series with Figure 3 showing the responses to PCTRO, while Figure 4 shows response to PCTRUNIN and Figure 5 shows impulse responses to PCTR with the component PCTRO removed. In these figures we have adopted the same plotting conventions as were used in Figure 2.

A quick glance at the three figures shows that the only figure that shows the significant state differences seen in Figure 2, is Figure 3. In particular, impulses to PCTRO lead to significant long-term gains in PI and GDP during recessionary states, while during expansionary states the effects are small and relatively short-lived, looking very much like the linear model responses. Although some further investigation is warranted before concluding this as the source of the responses seen in Figure 2, it is useful to mark this fact as noteworthy and one that we will come back to as we investigate other possibilities.

Figure 4 plots the responses to PCTRUNIN. Interestingly, and surprisingly, an impulse to PCTRUNIN does not result in much asymmetry. The impulses do result in relatively small and short-lived positive responses, but these responses are the same, regardless of whether the economy is in an expansion or a contraction. This symmetry occurs despite the outsized increases in PCTRUNIN that occurred during the Great Recession and the COVID-19 recession that were noted earlier in Figure 1. We interpret this symmetry as arising because of the automatic nature of unemployment insurance which moves with the economic cycle. So, even though unemployment insurance programs are often expanded and extended during economic downturns, these expansions and extensions are in line with the needs of the downturn and thus do not produce responses that are markedly different than seen in other settings.

Next, Figure 5 plots the responses to a series of our own construction. Here, we subtracted the series PCTRO from PCTR and used a minus notation in the graph.[13] As Figure 5 indicates, a good amount of the asymmetry goes away. The constructed series does produce short-lived positive responses which die off about the sixth quarter, but the confidence bands largely overlap during the expansionary and contractionary states indicating that the asymmetry is now insignificant.

[12] The shorter notation of PCTRO is useful in some of the results presented below as it allows for more compact tables.

[13] This minus notation can be mistaken for a dash, so we re-emphasize its meaning here.

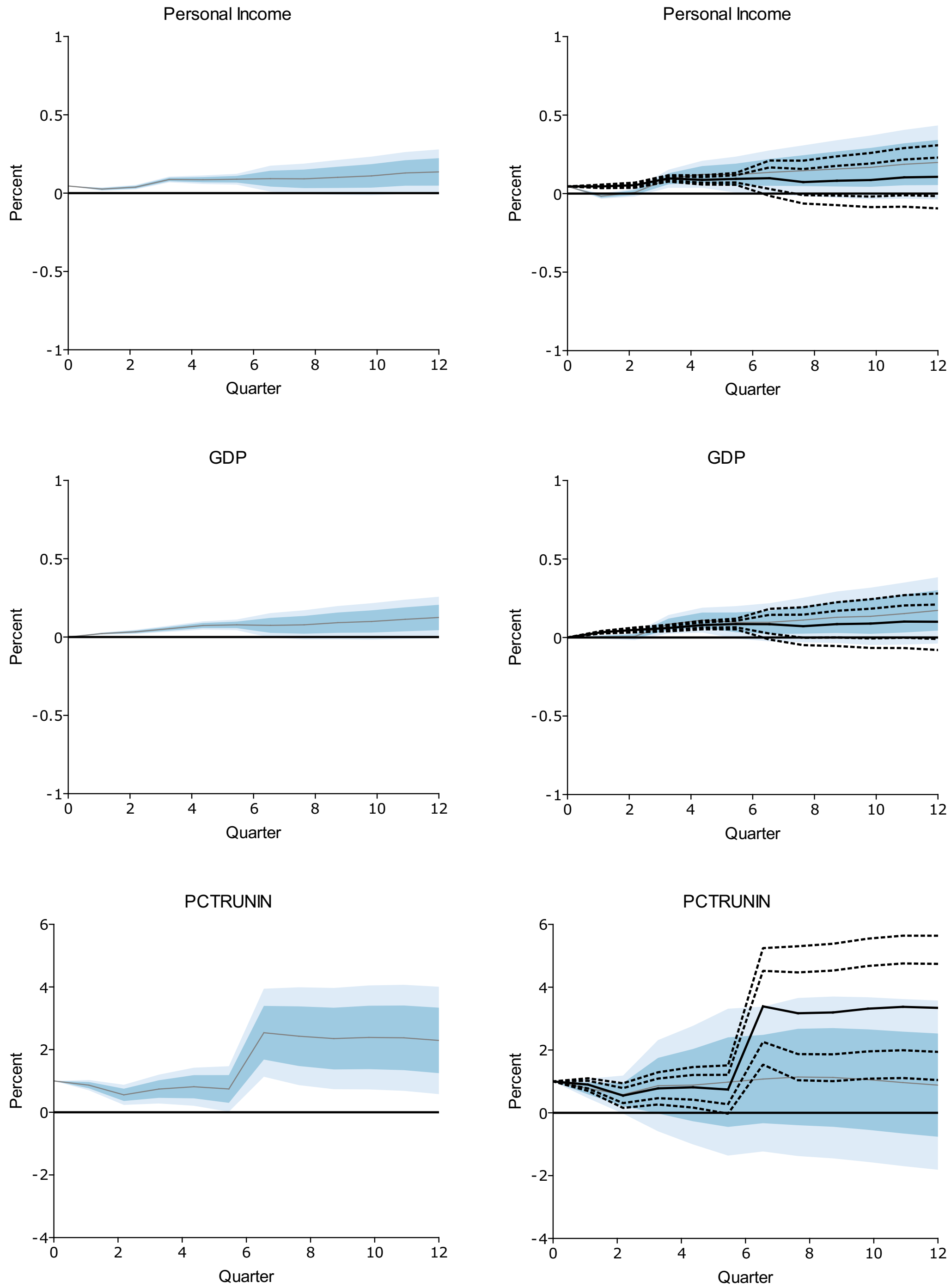

Figure 4: Response function to PCTRUNIN impulse

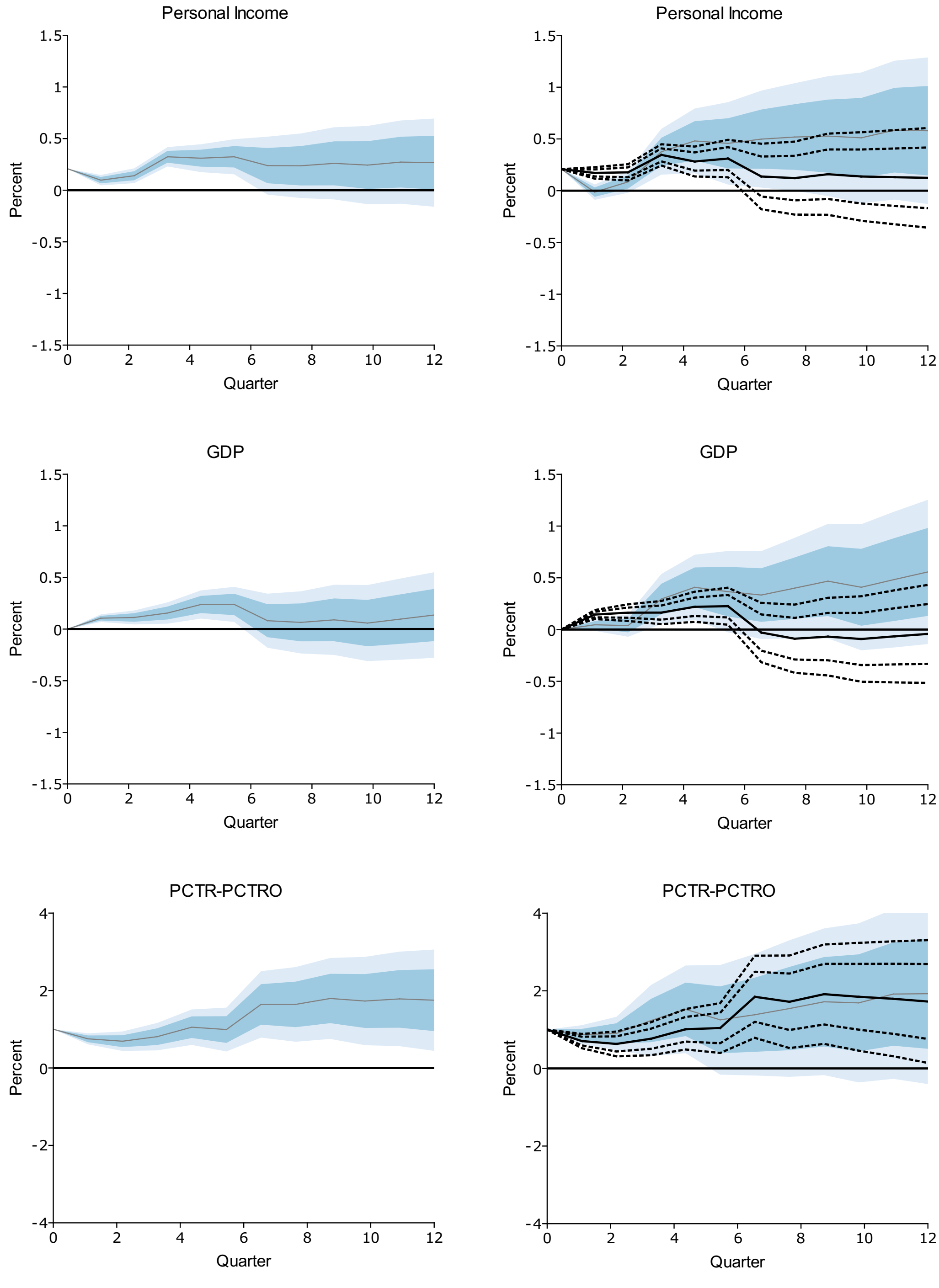

Figure 5: Response function to PCTR-PCTRO impulse

Finally, we undertake another exercise to show that the special programs undertaken during the 2008-09 and 2020 recessions are the source of the asymmetric responses. To do this, we focus on a subsample which excludes these recent recessions. Figures 6 and 7 show the same set of impulse response exercises as in Figures 2 and 3 respectively, over the interval 1960:1 to 2007:4. These figures show that the asymmetry has largely gone away and thus indicate that it is only the recent special programs implemented during the two recent recessions that are contained in the PCTRO series that generate the asymmetric responses.

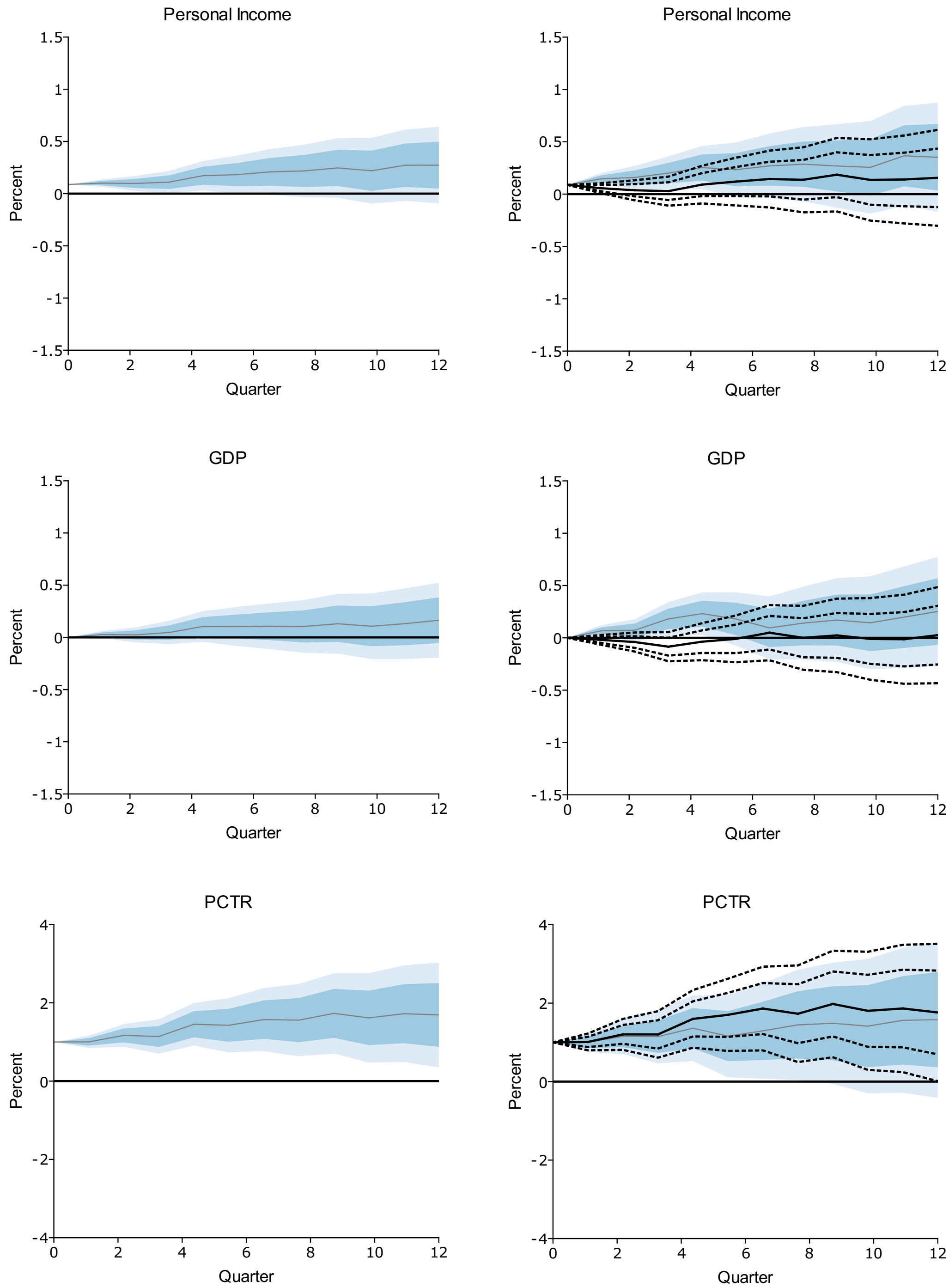

Figure 6: Response function to PCTR impulse - 1960:1 to 2005:4

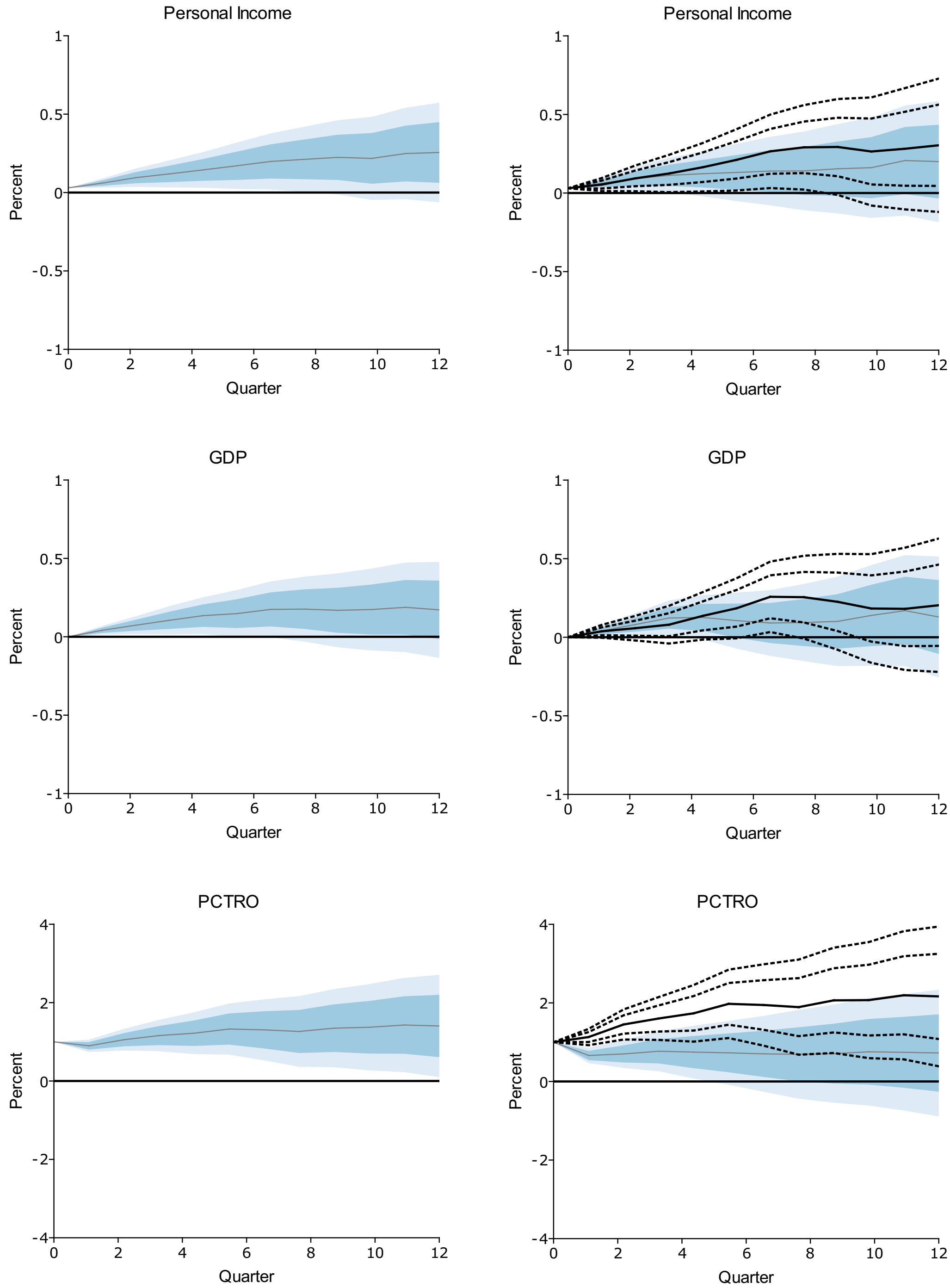

Figure 7: Response function to PCTRO impulse - 1960:1 to 2005:4

4 Forecast error variance decomposition results

Another useful time series econometric tool for revealing data patterns is the FEVD. Table 1 shows a number of FEVD results arranged in four vertical panels. Each vertical panel reports FEVD for three different forecast horizons in three horizontal panels. Here, we focus on only that part of the forecast error variance due to transfer payments and ignore the forecast error variance due to other components in the model. Each vertical panel consists of three columns. Three of the vertical panels, listed to the left of Table 1, use the full set of data, while one panel, listed to the right of Table 1, uses the subsample 1960:01 to 2007:04. For the full data set, the FEVD are computed with each of the three transfer payment series discussed earlier: PCTR, PCTRO, and PCTR-PCTRO.

Focusing on the PCTR vertical panel, we see three columns, PI, GDP, and PCTR, and then running down the rows of the table, we see FEVD information computed at one-year ahead, two-year ahead, and three-year ahead horizons. For each horizon, three rows are provided with the first row showing the portion of the forecast variable listed at the column head that is due to transfer payments at the one-year horizon for the linear model. Similarly, the next two rows show the portion of the forecast error for the variable listed at the column head that is due to transfer payments at the one-year horizon in the asymmetric model for both the contractionary and expansionary states.

At the one-year horizon, the linear model shows that PCTR explains 54.18% of the forecast error variance for PI, 16.03% of the forecast error variance for GDP, and 74.32% of the forecast error variance for itself. Without noting the numbers, the next two rows show that PCTR explains a large percentage of the forecast error variance for PI and GDP during contractionary states and a considerably smaller percentage of the variance during expansionary states. This pattern of greater accounting of the forecast error variance to PCTR during contractionary states continues down through the two-year and three-year ahead horizons.

Next, moving to the second vertical panel, with the results for PCTRO, we see that PCTRO also shows strong asymmetric results, with the percentage of the forecast error attributable to PCTRO for PI and GDP of similar magnitude to those from PCTR at each of the forecast horizons. Now, moving to the third vertical panel, with the results for PCTR-PCTRO, we see the asymmetry has been mitigated in much the same way as we saw in Figure 5. Finally, the last vertical panel which focuses on the early data period shows no asymmetry, like the results in Figures 6 and 7.[14]

[14] The results for PCTRUNIN are not presented here to save space, but they are also consistent with the results of Figure 4 and do not show an asymmetry.

Table 1: FEVD of transfer payment shocks

	Full sample (1960:01-2021:03)									Subsample (1960:01-2007:04)		
	PCTR			PCTRO			PCTR-PCTRO			PCTRO		
States	PI	GDP	PCTR	PI	GDP	PCTRO	PI	GDP	PCTR-PCTRO	PI	GDP	PCTRO
Forecast horizon of one-year ahead												
Linear	54.18	16.03	74.32	56.8	23.85	83.65	23.48	7.06	73.19	8.77	4.75	93.22
Contractionary	80.31	72.78	83.15	90.28	81.82	93.36	15.58	13.54	67.29	18.85	10.16	90.65
Expansionary	49.53	16.29	68.85	35.96	14.99	68.45	40.84	11.61	77.6	6.07	2.07	93.8
Forecast horizon of two-year ahead												
Linear	53.48	24.1	84.07	54.52	36.23	85.26	26.42	11.11	80.15	14.83	18.12	90.24
Contractionary	91.75	89.68	85.53	96.07	94.53	91.22	26.9	23.56	72.33	32.56	20.68	80.87
Expansionary	25.74	12.94	78.46	16.54	10.87	73.24	29.44	9.32	84.35	17.89	14.34	90.03
Forecast horizon of three-year ahead												
Linear	50.58	20.01	89.89	54.81	39.08	88.026	26.23	8.69	80.13	24.74	20.31	80.34
Contractionary	91.82	90.45	88.5	96.1	95.3	90.12	30.39	24.72	65.84	45.96	33.7	79.74
Expansionary	11.72	8.69	87.24	7.53	5.52	76.5	16.03	5.15	82.59	21.69	16.2	78.9

Overall, the FEVD analysis confirms the results seen in the IRF analysis. The FEVD indicates an asymmetry in the economic responses of PI and GDP to both PCTR and PCTRO at all three horizons given in the table. Furthermore, if one removes the PCTRO series from PCTR, or if one focuses on the pre 2008 data, the asymmetry goes away.

5 Robustness

Several robustness checks were conducted. These include using the NBER recession dates as the threshold indicator, ordering the variables differently in the VAR and considering a four-variable model that adds the Federal Funds Rate as an explanatory variable. In the subsections below, we describe these exercises in further detail. An appendix with additional IRF plots is also available from the authors upon request.

5.1 Threshold based on the NBER recession dates

Sahm's rule is designed to show the presence of economic weakness. An alternative measure of economic weakness is the NBER recession date series. With this threshold indicator, it was found that earlier results held up, with both PCTR and PCTRO showing positive effects in the linear models. In contrast, the asymmetric models showed weak stimulative effects during strong economic periods and strong stimulative effects during weak economic periods. However, the asymmetric model results with this alternative threshold indicator are not as strong as the baseline results. One reason could be that the Sahm rule is designed to anticipate forthcoming economic weakness or forthcoming economic strength. These results show that the different states depend partly on anticipation and not just actual experience. Furthermore, the asymmetries went away with the PCTRUNIN data and the constructed series, PCTR-PCTRO.

5.2 Model in which transfer payments is ordered first

A traditional approach for modeling government policy regards policy as being exogenous.[15] This view would put transfer payments before GDP in the Cholesky ordering. We also investigated this ordering in which transfer payments are ordered first, GDP is ordered second and

[15] This was the ordering used in Blanchard and Perotti (2002) in their analysis which focused more on spending than on transfer payments.

PI is ordered last. With this alternative ordering, the results described above were found to be present again.

5.3 Model with monetary policy

The previous models only included fiscal policy. One could argue that an important missing variable is a monetary policy variable. So as another check, the Federal Funds Rate was added to the model. We followed common practice in the macroeconomic literature, which is to order monetary policy last, so that monetary policy could respond to other variables contemporaneously, but the monetary policy could not affect other variables contemporaneously. This extended model again showed that there are important positive effects from the extended transfer payment series only during economic weakness.

6 Conclusion

This paper investigated the stimulative effects of transfer payments on PI and GDP impulse response functions and forecast error variance decompositions. It is shown that under symmetric response assumptions, positive transfer payment impulses lead to positive stimulative effects for PI and GDP lasting about six quarters. The origin of this result was investigated using asymmetric models and exploring the subseries of the transfer payment series. It was found that the stimulative effects were asymmetric. During economic weakness, the stimulative effects are relatively lengthy, lasting up to twelve quarters. However, during economic strength the stimulus was small and not very long-lived. Breaking transfer payments into its subseries showed that much of the asymmetry is due to the special programs of the Great Recession and the COVID-19 recession. Removing the special programs from the transfer payment data shows a reduced asymmetry but does continue to show greater stimulus during economic weakness. Focusing on data prior to these recent recessions shows much smaller stimulative effects and no asymmetry in the responses. Interestingly, even with the recent recessionary unemployment insurance expansions, unemployment insurance programs do not show any asymmetry, but they do show small stimulative effects.

These results indicate that using transfer payments as economic stimulus for the economy during expansionary economic conditions does not lead to large gains in personal income and gross domestic product. In addition, regardless of economic conditions, expansions in unemployment benefits do not result in large gains in personal income and gross domestic product. Policy intended to stimulate personal income and gross domestic product through transfer payments will have its greatest impact during contractionary economic conditions and through special programs such as those enacted during the Great Recession and the COVID-19 recession.

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Appendices

These appendices are not intended for publication

A Robustness exercises - Some alternative models

This appendix shows the graphical results for each of the robustness exercises described earlier.

A.1 Threshold based on NBER recession dates

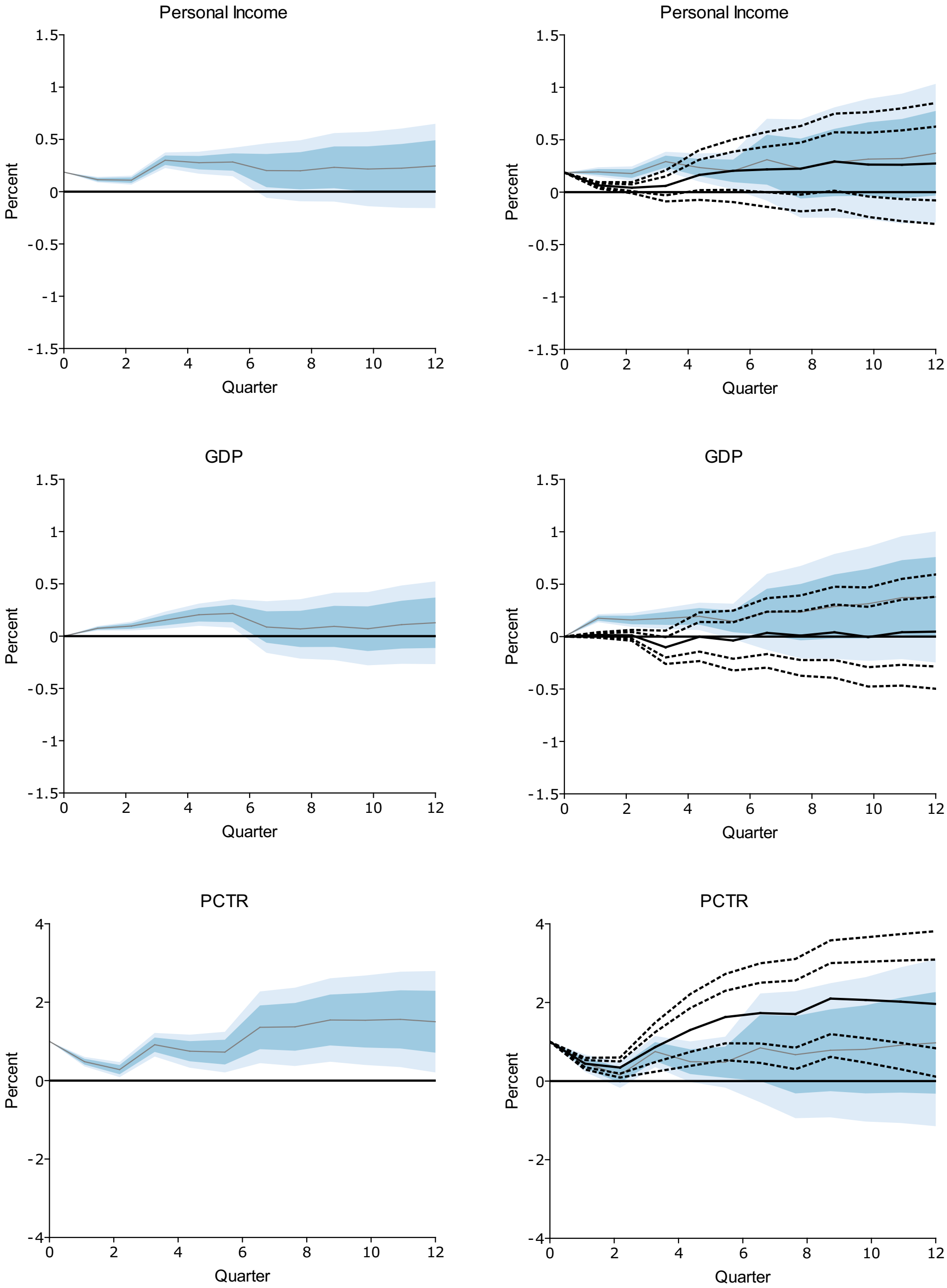

Figure 8: Response function to PCTR impulse using NBER recession dates as a threshold indicator.

A.2 Transfer payments ordered first

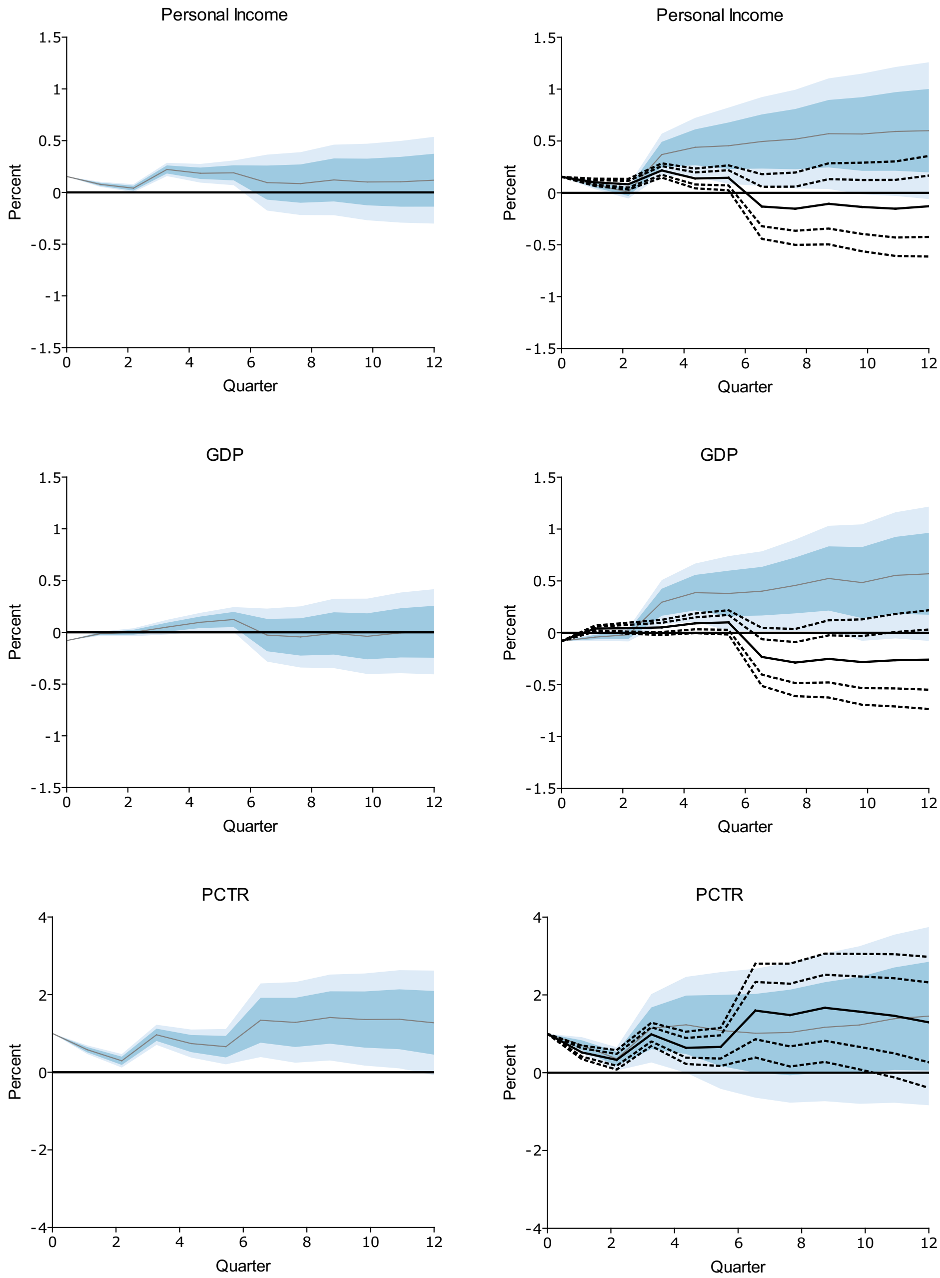

Figure 9: Response function to PCTR impulse with PCTR ordering first, followed by GDP and personal income.

A.3 Model with monetary policy

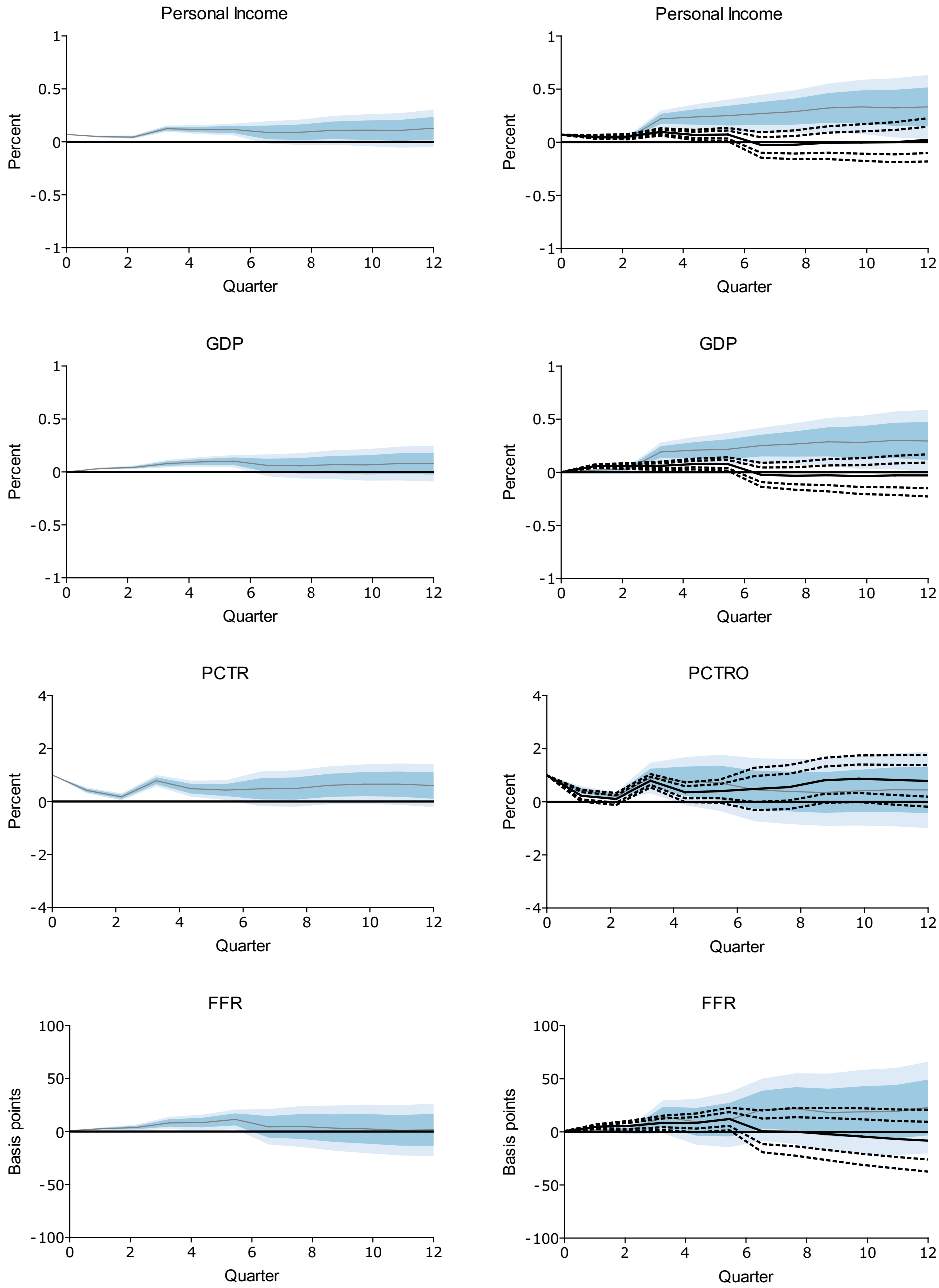

Figure 10: Response function to PCTRO impulse in an extended VAR including the monetary policy variable.

B FEVD for PCTRUNIN payment shocks

FEVD of PCTRUN shocks

Full sample (1960:Q1-2021:Q3)

PCTRUN			
States	PI	GDP	PCTRUN
Forecast horizon of one-year ahead			
Linear	41.20	18.94	36.31
Recessionary	34.41	32.56	46.15
Expansionary	53.28	24.25	36.67
Forecast horizon of two-year ahead			
Linear	44.13	36.65	54.63
Recessionary	46.70	42.86	59.40
Expansionary	44.53	35.24	54.84
Forecast horizon of three-year ahead			
Linear	65.82	47.05	65.82
Recessionary	50.67	45.89	66.98
Expansionary	33.55	35.66	66.02

C Data

Column 1 - Year

Column 2 - Quarter

Column 3 - Real Personal Income (RPI), from FRED. Original source: U.S. Bureau of Economic Analysis.

Column 4 - Real GDP (GDPC1), from FRED. Original source: U.S. Bureau of Economic Analysis.

Column 5 - Nominal Personal Income (PINCOME), from FRED. Billions of dollars, seasonally adjusted annual rate. Quarterly average. Original source: U.S. Bureau of Economic Analysis.

Column 6 - Nominal GDP (GDP), from FRED. Billions of dollars, seasonally adjusted annual rate. Quarterly average. Original source: U.S. Bureau of Economic Analysis.

Column 7 - Personal Current Transfer Reciepts (PCTR), from FRED. Billions of dollars, seasonally adjusted annual rate. Quarterly average. Original source: U.S. Bureau of Economic Analysis.

Column 8 - Personal current transfer receipts: Government social benefits to persons: Other (W827RC1), from FRED. Billions of dollars, seasonally adjusted annual rate. Quarterly average. Original source: U.S. Bureau of Economic Analysis.

Column 9 - Federal Funds Effective Rate (FEDFUNDS), from FRED. Original source: Board of Governors of the Federal Reserve System (US).

Column 10 - Unemployment Rate (UNRATE), from FRED. Original source: U.S. Bureau of Labor Statistics.

Column 11 - NBER based Recession Indicators for the United States from the Peak through the Trough (USRECQM), from FRED. Source is listed as the Federal Reserve Bank of St. Louis.

Column 12 - Real-time Sahm Rule Recession Indicator (SAHMREALTIME), from FRED. Original source Claudia Sahm.

Column 13 - Inflation

Column 14 - ffr_wuxia

Column 15 - Consumer Price Index for All Urban Consumers: All Items in U.S. City Average (CPIAUCSL), from FRED. Original source: U.S. Bureau of Labor Statistics.

Column 16 - Personal Consumption Expenditures (PCE), from FRED. Original source: U.S. Bureau of Economic Analysis.

Column 17 - GDP Implicit Price Deflator in United States (USAGDPDEFQISMEI), from FRED. Original source: Organization for Economic Co-operation and Development.

Column 18 - Personal current transfer receipts: Government social benefits to persons: Unemployment insurance (W825RC1), from FRED. Original source: U.S. Bureau of Economic Analysis.