Appendix to: Time Variation in the Dynamics of Worker Flows: Evidence from North America and Europe

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1 Bayesian Econometric Methods

In this section we provide additional details about our estimation of the VAR and heteroskedastic TVP-VAR. The homoskedastic TVP-VAR is the same as the heteroskedastic TVP-VAR except the treatment of its error covariance matrix model is the same as the VAR. Complete details on posterior inference in all those models is given in, among other places, Koop and Korobilis (2009).

As described in the paper, the basic VAR can be written as

$$y_t = Z_t\theta + \varepsilon_t, \tag{1}$$

and the TVP-VAR extends this into

$$y_t = Z_t\theta_t + \varepsilon_t, \tag{2}$$

where

$$\theta_t = \theta_{t-1} + \eta_t. \tag{3}$$

In a heteroskedastic TVP-VAR, ε_ts are assumed to be independent $N(0, H_t)$. Following Primiceri (2005), we use a triangular decomposition to model H_t:

$$H_t = A_t^{-1}\Sigma_t\Sigma_t^{'}(A_t^{-1})^{'}, \tag{4}$$

where Σ_t is a diagonal matrix with diagonal elements $\sigma_{j,t}$ for $j = 1, 2, ..., n$ and A_t is a lower triangular matrix with ones on the diagonal. That is, it takes the form:

$$A_t = \begin{pmatrix} 1 & 0 & ... & . & 0 \\ a_{21,t} & 1 & ... & . & . \\ . & . & ... & . & . \\ . & . & ... & 1 & 0 \\ a_{n1,t} & . & ... & a_{n(n-1),t} & 1 \end{pmatrix}$$

Let $\sigma_t = (\sigma_{1,t}, \sigma_{2,t}, ..., \sigma_{n,t})'$ and $a_t = (a_{21,t}, a_{31,t}, a_{32,t}, ..., a_{n(n-1),t})'$. These are allowed to evolve according to the following state equations:

$$log(\sigma_t) = log(\sigma_{t-1}) + u_t, \tag{5}$$

and

$$a_t = a_{t-1} + v_t. \tag{6}$$

1.1 Priors and Posteriors

The VAR given in (1) can be rewritten as:

$$Y = X\Theta + E$$

where $E = (\varepsilon_1, \varepsilon_2, ..., \varepsilon_T)'$ is the $T \times n$ matrix of error terms, $Y = (y_1, y_2, ..., y_T)'$ is the $T \times n$ matrix of observations, X is a $T \times (np+1)$ matrix with t^{th} row containing an intercept and p lags of each of the n dependent variables. Θ is the matrix of VAR coefficients with $vec(\Theta) = \theta$.

In this model, with a noninformative prior, the posterior for H^{-1} is Wishart: $W(\widehat{H}^{-1}/T, T)$ with $E(H^{-1}) = \widehat{H}^{-1}$. The posterior for θ conditional on H is $N(\widehat{\theta}, H \otimes (X'X)^{-1})$ where

$$\widehat{\Theta} = (X'X)^{-1}X'Y, \quad \widehat{H} = \frac{1}{T}(Y - X\widehat{\Theta})'(Y - X\widehat{\Theta}).$$

For the TVP-VAR defined by equations (2) to (6), MCMC methods are required. We use the same MCMC algorithm as Primiceri (2005) and the reader is referred to his paper for complete details. Briefly, conditional on all the other parameters, we draw from the posterior for θ_t (for $t = 1, .., T$) using standard Bayesian methods for state space models. We use the algorithm of Carter and Kohn (1994). The same algorithm is used to draw a_t. The algorithm of Kim, Shephard and Chib (1998), is used to draw the volatilities, $log(\sigma_t)$.

The covariance matrices of the errors in the state equations, Q, W and C are drawn from inverse-Wishart distributions (see Koop and Korobilis, 2009, Section 3.2 for precise formulae). As in Primiceri (2005), we assume C to be block diagonal with blocks C_1 and C_2.

We also use training sample priors as in Primiceri (2005) to initialize the states in the state equations and provide priors for Q, W and C. In particular, OLS estimates from a constant coefficient VAR using an initial training sample of size τ are used to calibrate the prior. Let $\widehat{\theta}_{OLS}$ and $V(\widehat{\theta}_{OLS})$ be the OLS estimate and its covariance matrix for the VAR coefficients. Similarly, the OLS estimate of the error covariance matrix can be decomposed as in (6) to provide

us with $\widehat{\sigma}_{OLS}$, $\widehat{A}_{OLS}$ and $V(\widehat{A}_{OLS})$. Primiceri (2005) uses the following prior

$$\theta_0 \sim N(\widehat{\theta}_{OLS}, 4.V(\widehat{\theta}_{OLS}))$$

$$A_0 \sim N(\widehat{A}_{OLS}, 4.V(\widehat{A}_{OLS}))$$

$$log\,(\sigma_0) \sim N(log\,(\widehat{\sigma}_0)\,, I_3)$$

$$Q \sim IW(k_Q^2 \tau V(\widehat{\theta}_{OLS}), \tau)$$

$$W \sim IW(4k_W^2 I_3, 4)$$

$$C_1 \sim IW(2k_C^2 V(\widehat{A}_{1,OLS}), 2)$$

$$C_2 \sim IW(3k_C^2 V(\widehat{A}_{2,OLS}), 3)$$

where $\widehat{A}_{1,OLS}$ and $\widehat{A}_{2,OLS}$ are the blocks of $\widehat{A}_{OLS}$ corresponding to the blocking of C into C_1 and C_2. With this setup, the complicated prior elicitation procedure for the high-dimensional TVP-VAR is reduced to the choice of τ and the scalars k_Q, k_C and k_W. Following Primceri (2005), the main results in our paper set these scalars to be 0.01, 0.1 and 0.01, respectively. For the training sample, we use the initial 5 years of data, $\tau = 20$. In a prior sensitivity analysis, we investigate the sensitivity of the prior to these choices. For the homoskedastic TVP-VAR, we require a prior for H. Given the scale of the data the following choice is centered in a sensible region, but is relatively noninformative:

$$H \sim IW(\widehat{H}_0, 4).$$

where $\widehat{H}_0$ is the OLS estimate of the error covariance matrix using the training sample.

1.2 Impulse Response Analysis Using Sign Restrictions

To estimate the impulse responses, we extend the sign restriction approach of Uhlig (2005) which was developed for the VAR to the TVP-VAR framework. Basically, the approach of Uhlig (2005) involves repeatedly simulating impulse

responses from the VAR, but omitting draws which violate the sign restrictions. With the TVP-VAR we implement this approach by calculating sign-restricted impulse responses at time t using the VAR coefficients and VAR error covariance matrix which hold at time t (i.e. θ_t and H_t). With the TVP-VAR the impulse response simulation must be done within a posterior simulation algorithm which can be computationally costly. Accordingly, we calculate sign restricted impulse responses at a few selected time periods, rather than for all t. Precise details are provided in the remainder of this section.

Suppose that ω_t is an $n \times 1$ vector of mutually independent structural innovations with $E(\omega_t \omega_t^{'}) = I_n$. The relationship between ε_t and ω_t can be written as $\varepsilon_t = G_t \omega_t$, with the only restriction that $G_t G_t^{'} = H_t$. Thus, if $\omega_{t+1} = e_j$, with e_j being an $n \times 1$ vector with zeros everywhere except for the jth entry equal 1, we have $\varepsilon_{t+1} = G_t e_j = g_{t,j}$, with $g_{t,j}$ being the jth column of G_t. Similarly, we can compute $r^h_{e_j,o,t}$, the impact responses of variable o at horizon h to a shock e_j, as $r^h_{e_j,o,t} = (\Gamma_t^h \mathbf{g}_{j,t})_o$, where $\mathbf{g}_{j,t} = (g_{j,t}^{'}, 0_{1,p(l-1)})'$, and

$$\Gamma_t = \begin{pmatrix} B_{1,t} & B_{2,t} & ... & B_{l-1,t} & B_{l,t} \\ I_n & 0 & ... & 0 & 0 \\ 0 & I_n & ... & 0 & 0 \\ ... & & ... & & ... \\ 0 & 0 & ... & I_n & 0 \end{pmatrix}$$

with the $n \times n$ matrix $B_{i,t}$, whose elements are contained in θ_t, being the parameter matrix corresponding to the ith lagged dependent variables in the TVP-VAR.

Following Uhlig (2005), we decompose H_t into $G_t = X_t \Lambda_t^{\frac{1}{2}} F_t$, where X_t is an $n \times n$ orthogonal matrix whose columns are the orthonormal eigenvectors of H_t, $\Lambda_t = diag(\lambda_{1,t}, \lambda_{2,t}, ..., \lambda_{n,t})$ is the corresponding eigenvalue matrix of Σ_t, and F_t is an $n \times n$ orthogonal matrix (i.e., $F_t F_t^{'} = I_n$). Then an impulse vector g_t can be constructed as following:

$$g_t = X_t \Lambda_t^{\frac{1}{2}} f_t \tag{7}$$

where f_t is an orthonormal vector uniformly drawn from a unit sphere. Let $\mathbf{g}_t = (g_t^{'}, 0_{1,p(l-1)})^{'}$, with l being the lag length of the TVP-VARs. We can

calculate the impact responses of variable o at horizon h to a shock at time t as $r^h_{o,t} = (\Gamma^h_t \mathbf{g}_t)_k$. By repeatedly generating a large number of g_t and imposing a set of inequality constraints on r^h_o, the impulse responses are obtained.

The sign restriction approach is incorporated in our TVP-VAR MCMC algorithm. We generate 1000 impulse response vectors, g_t, at each MCMC draw. The posteriors for our impulse responses are based only on those draws that meet the sign restrictions.

2 Empirical Results

This section contains the plots of data and full set of graphs for impulse response functions and variance decompositions, including those already appear in the paper. We keep the duplicates in hope that the readers can easily make comparisons in the empirical appendix. The rest of the section is divided into two parts, we first briefly explain how the graphs are organized, then we present the graphs.

Figures 1 to 5 plot the data. Figures 6 to 10 plot the posterior means of the standard deviations of the errors in the heteroskedastic TVP-VARs. Figures A. 1 to A. 120 present the results for benchmark models, where the future horizon k used for sign restrictions is set to be 2 quarters. To check whether the results for TVP-VAR models are sensitive to the choice of future horizon used for the sign restrictions, without making any changes in the priors, we subsequently present impulse responses of the separation and job-finding hazards, unemployment rates and vacancies using different values for k. Figures B.1 to B.40 present results when k is set to be 1 quarter, while Figures C.1 to C. 40 present results when k is set to be 4 quarters.

To see whether our empirical results are robust to the prior choices, in Figures D.1 to D.40 we present impulse responses with the following changes in priors: For the heteroskedastic TVP-VAR models the scalars k_Q, k_C and k_W are set to be 0.05, 0.1 and 0.05; For the homoskedastic TVP-VAR models the prior for H is set to be $H \sim IW(0.1I_3, 4)$. Note that in this case, the future

horizon for sign restrictions is set to be 2 quarters, the same as used for the benchmark models.

Finally, in Figures E. 1 to E. 40, we report the impulse responses for TVP-VAR models using data that are not detrended. We use the same priors and sign restrictions as in the main body of the paper, where the data are detrended.

Below is a more detailed plan of how we arrange the graphs.

- Figures 1 -5 plot the data.
- Figures 6 -10 plot the volatilities in the heteroskedastic TVP-VARs.
- Figures A.1 -A.120 present results for the benchmark models with $k = 2$. Among them,
  - Figures A.1 -A.34 are associated with the impulse response functions.
    - Figures A.1 -A.17 are for the US;
    - Figures A.18 -A.34 are for Canada;
    - Figures A.35 -A.51 are for France;
    - Figures A.52 -A.68 are for Spain;
    - Figures A.69 -A.85 are for the UK.
  - Figures A.86 -A.120 are associated with variance decompositions.
    - Figures A.86 -A.92 are for the US;
    - Figures A.93 -A.99 are for Canada;
    - Figures A.100 -A.106 are for France;
    - Figures A.107 -A.113 are for Spain;
    - Figures A.114 -A.120 are for the UK.
- Figures B.1 - B.40 present the impulse responses when $k = 1$. Among them,
  - Figures B.1 -B.8 are for the US;
  - Figures B.9 -B.16 are for Canada;
  - Figures B.17 -B.24 are for France;

- Figures B.25 -B.32 are for Spain;
- Figures B.33 -B.40 are for the UK.

- Figures C.1 - C.40 present the impulse responses when $k = 4$. Among them,
  - Figures C.1 -C.8 are for the US;
  - Figures C.9 -C.16 are for Canada;
  - Figures C.17 -C.24 are for France;
  - Figures C.25 -C.32 are for Spain;
  - Figures C.33 -C.40 are for the UK.

- Figures D.1 -D.40 present the impulse responses for prior sensitivity analysis. Among them,
  - Figures D.1 -D.8 are for the US;
  - Figures D.9 -D.16 are for Canada;
  - Figures D.17 -D.24 are for France;
  - Figures D.25 -D.32 are for Spain;
  - Figures D.33 -D.40 are for the UK.

- Figures E.1 -E.40 present the impulse responses for data that are not detrended. Among them,
  - Figures E.1 -E.8 are for the US;
  - Figures E.9 -E.16 are for Canada;
  - Figures E.17 -E.24 are for France;
  - Figures E.25 -E.32 are for Spain;
  - Figures E.33 -E.40 are for the UK.

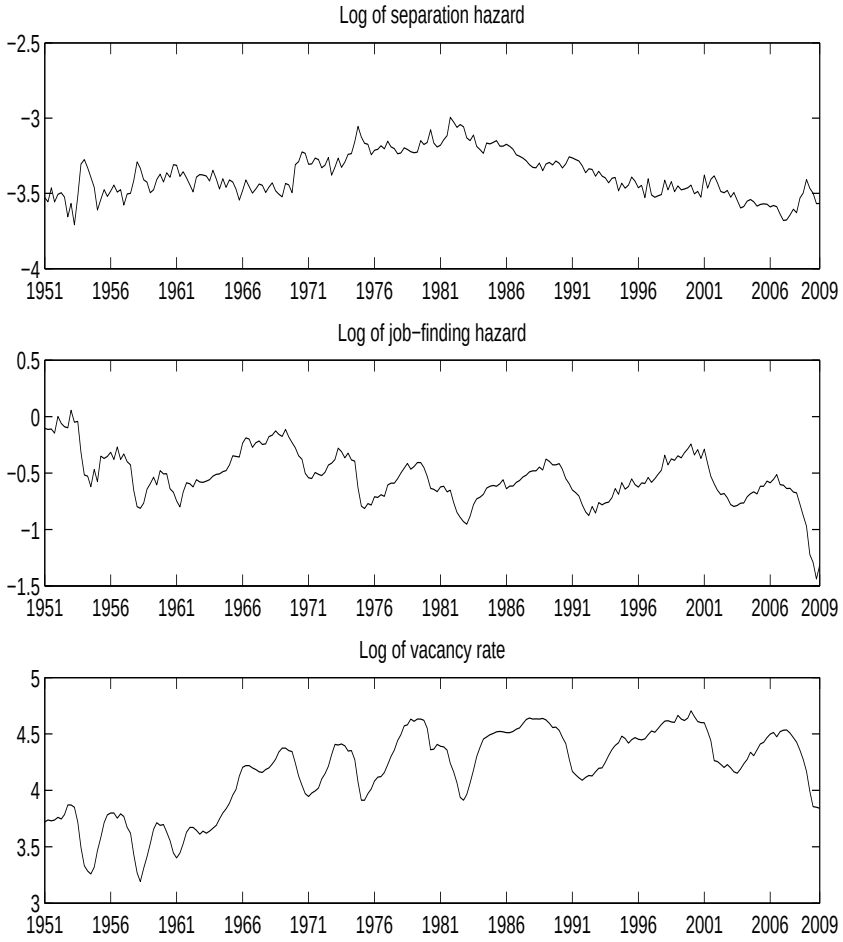


Figure 1. US Data

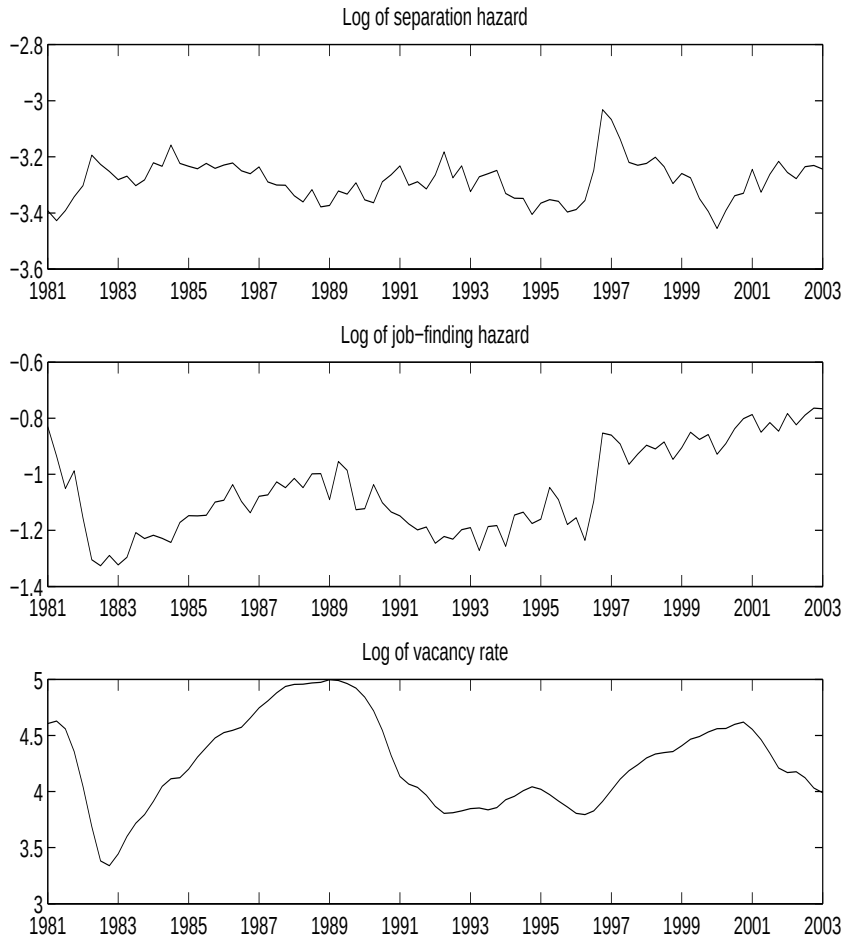


Figure 2. Canada Data

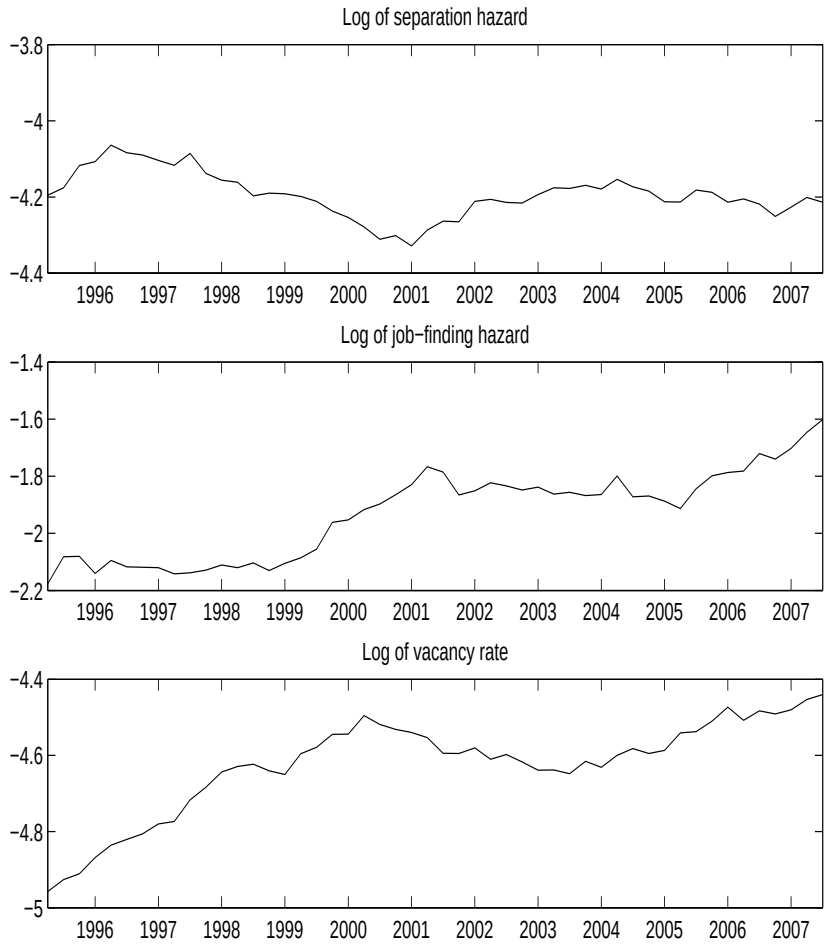


Figure 3. France Data

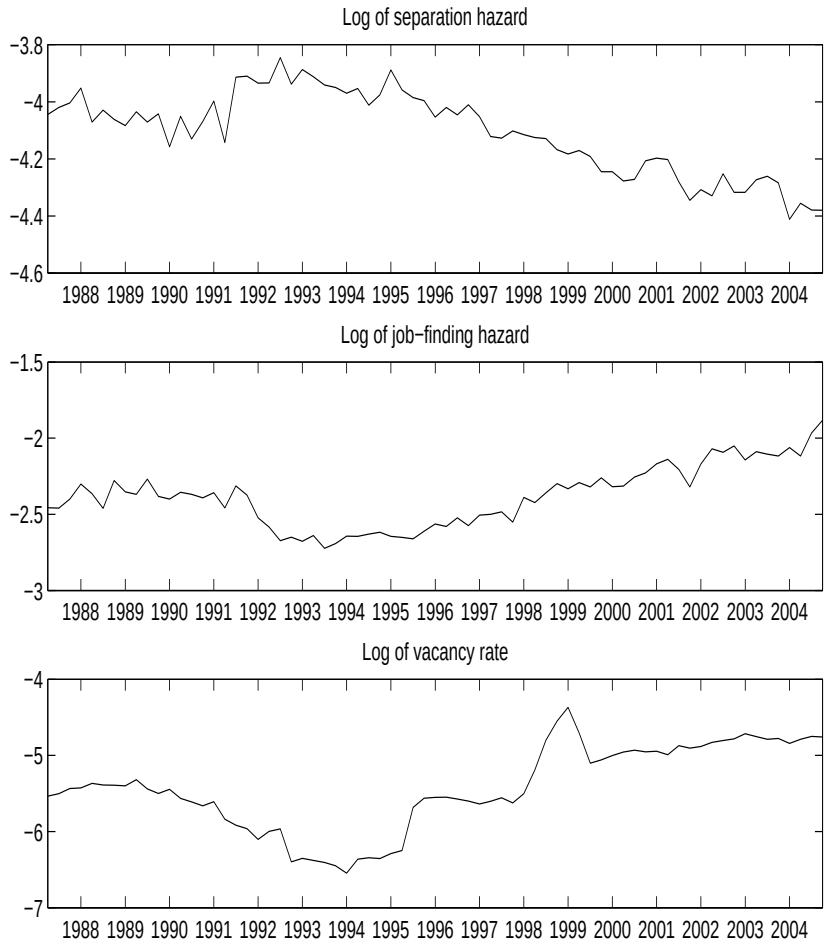


Figure 4. Spain Data

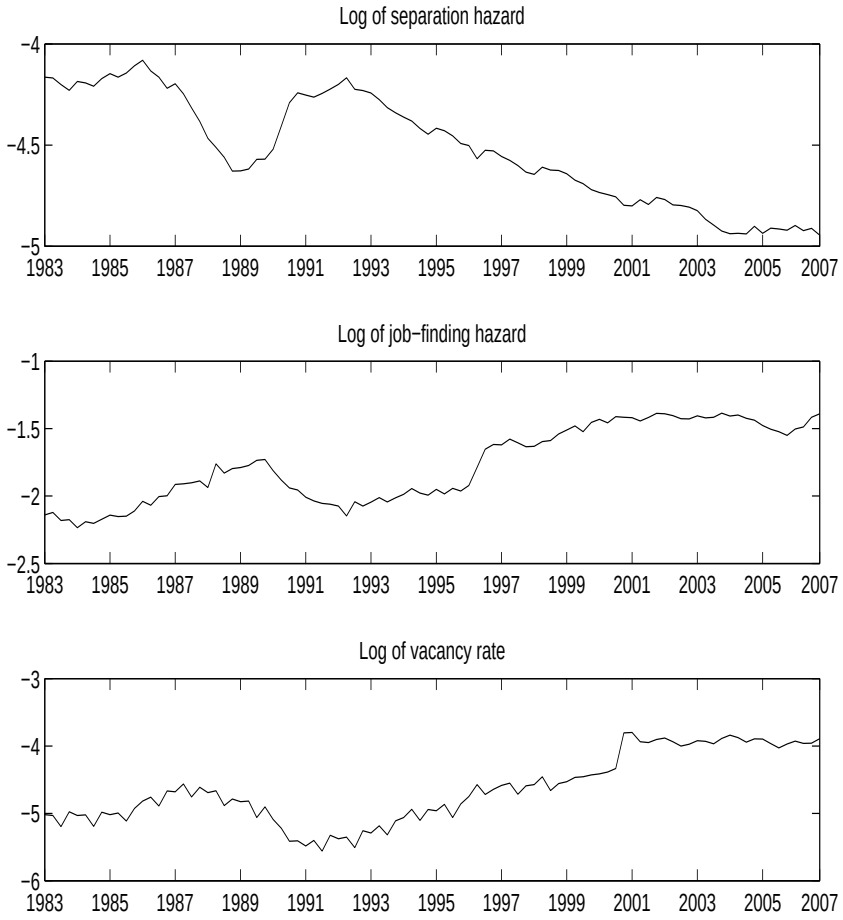


Figure 5. UK Data

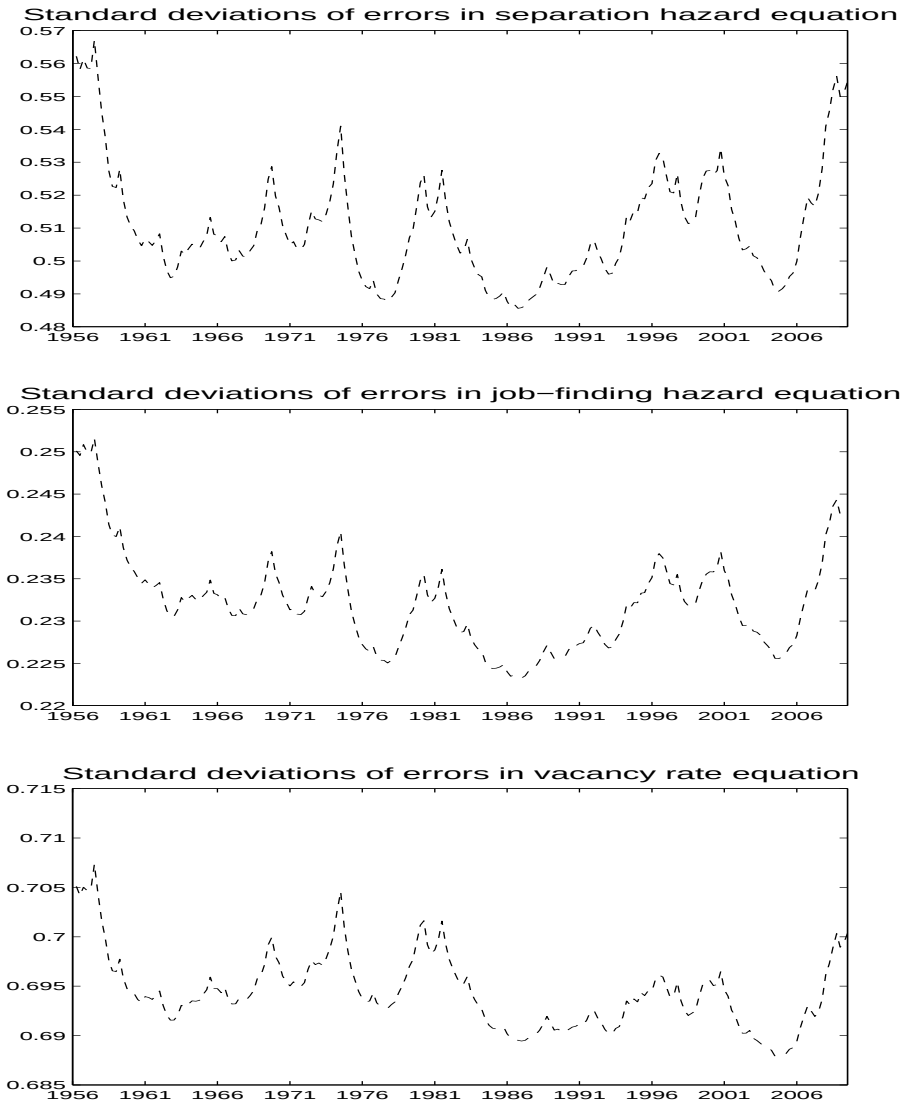


Figure 6. Standard Deviations -*Hete TVP-VAR*, US

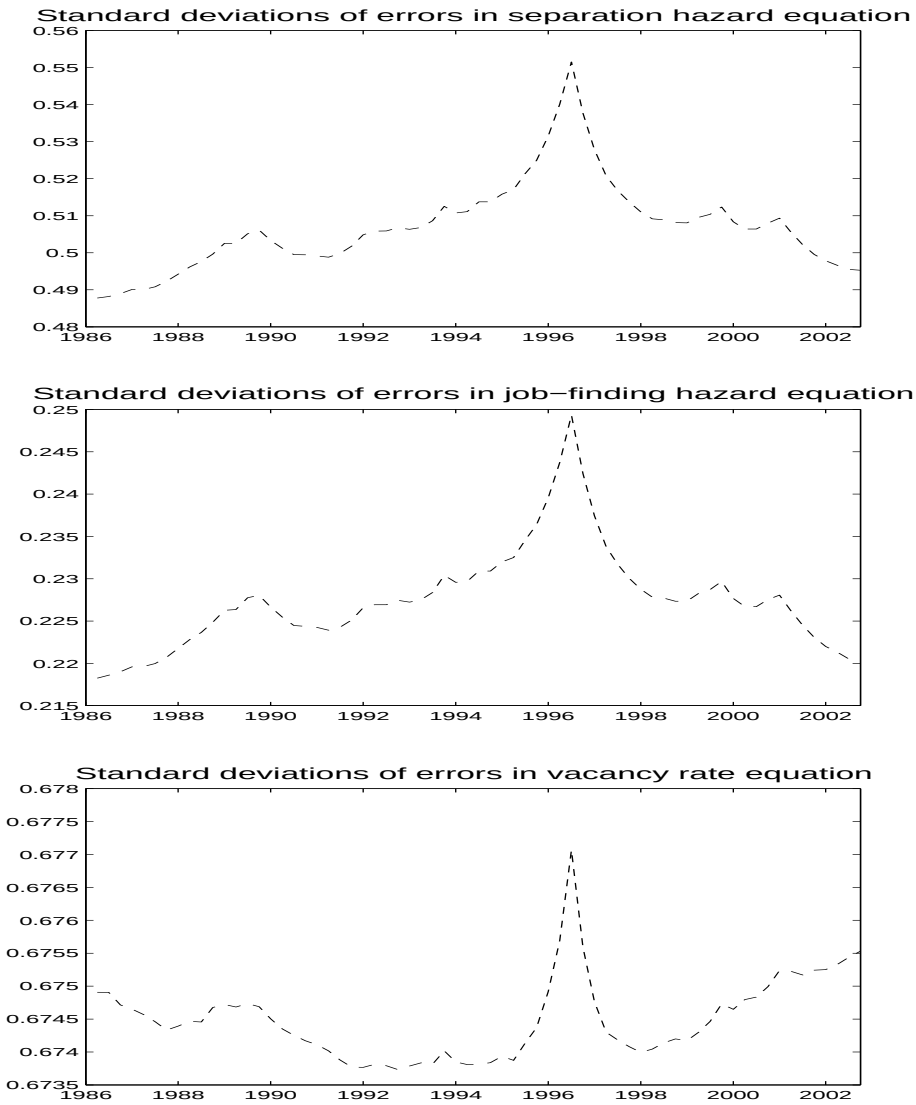


Figure 7. Standard Deviations -*Hete TVP-VAR*, Canada

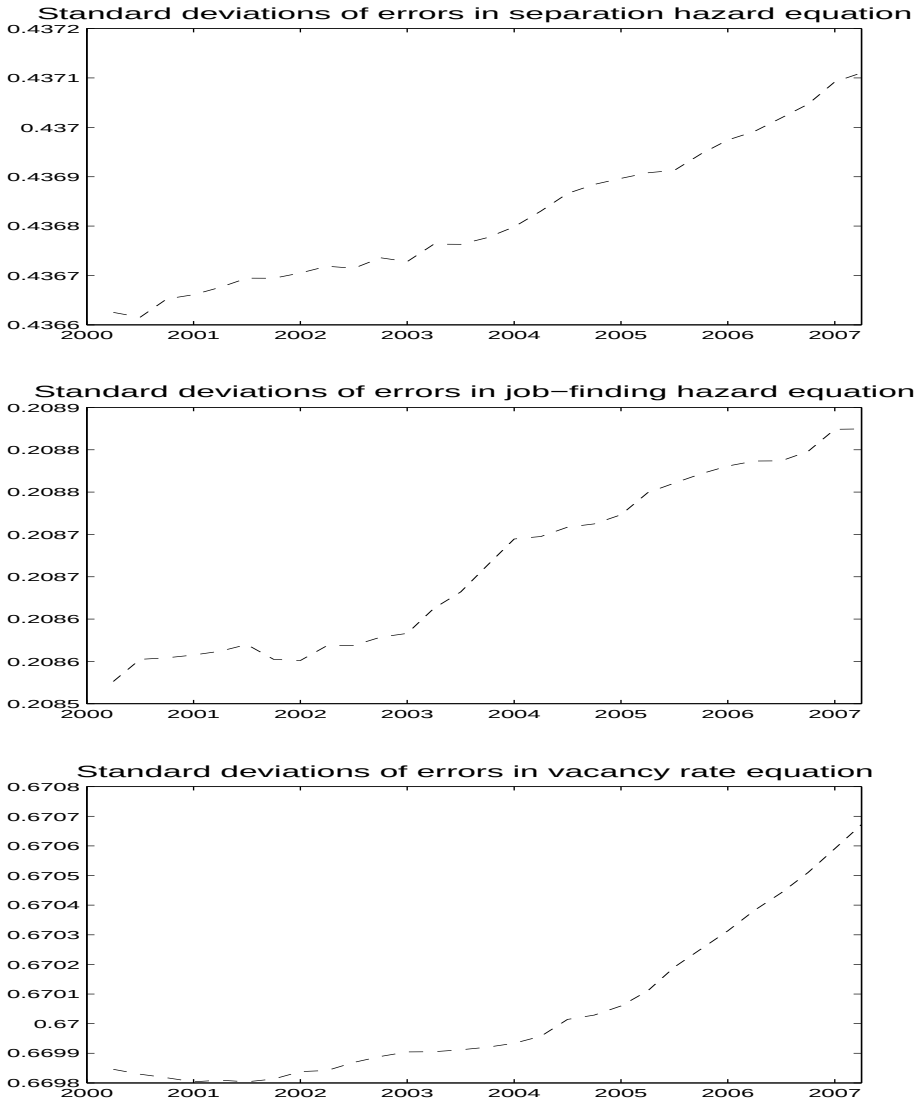


Figure 8. Standard Deviations -*Hete TVP-VAR*, France

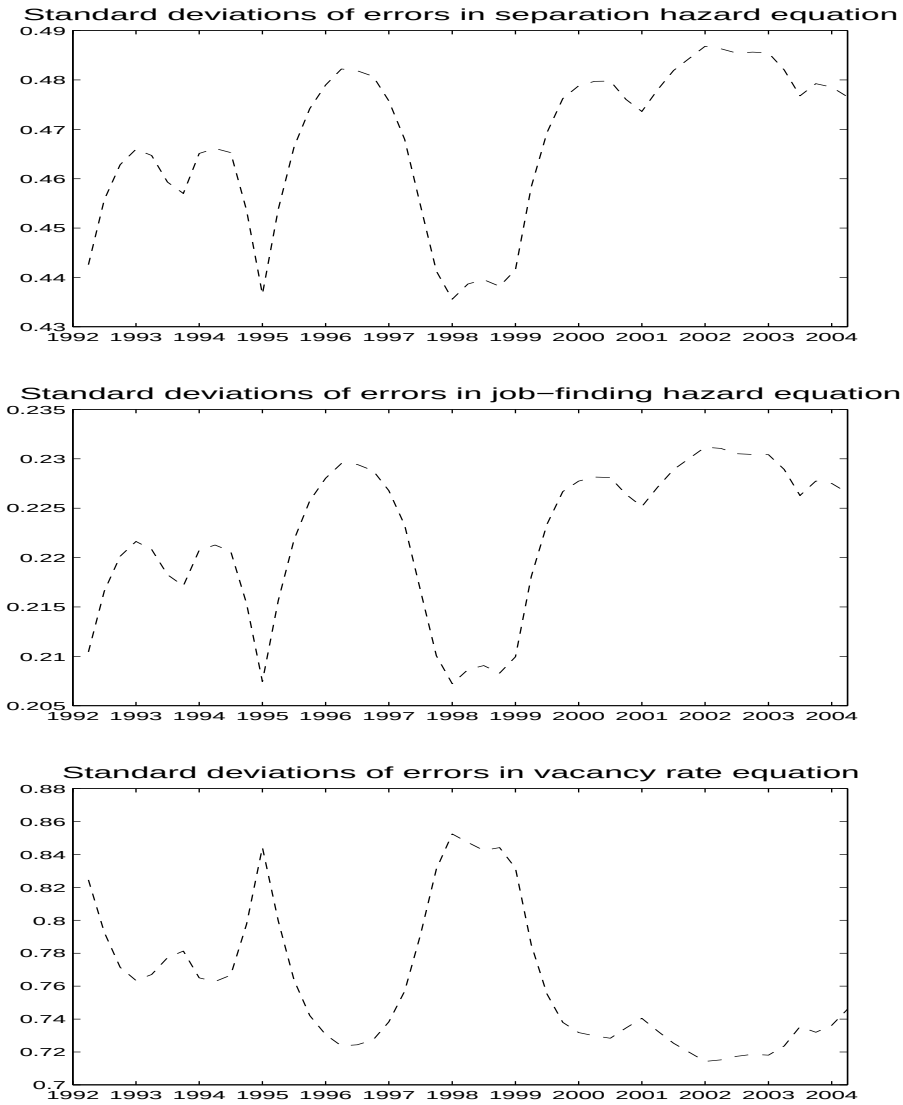


Figure 9. Standard Deviations -*Hete TVP-VAR*, Spain

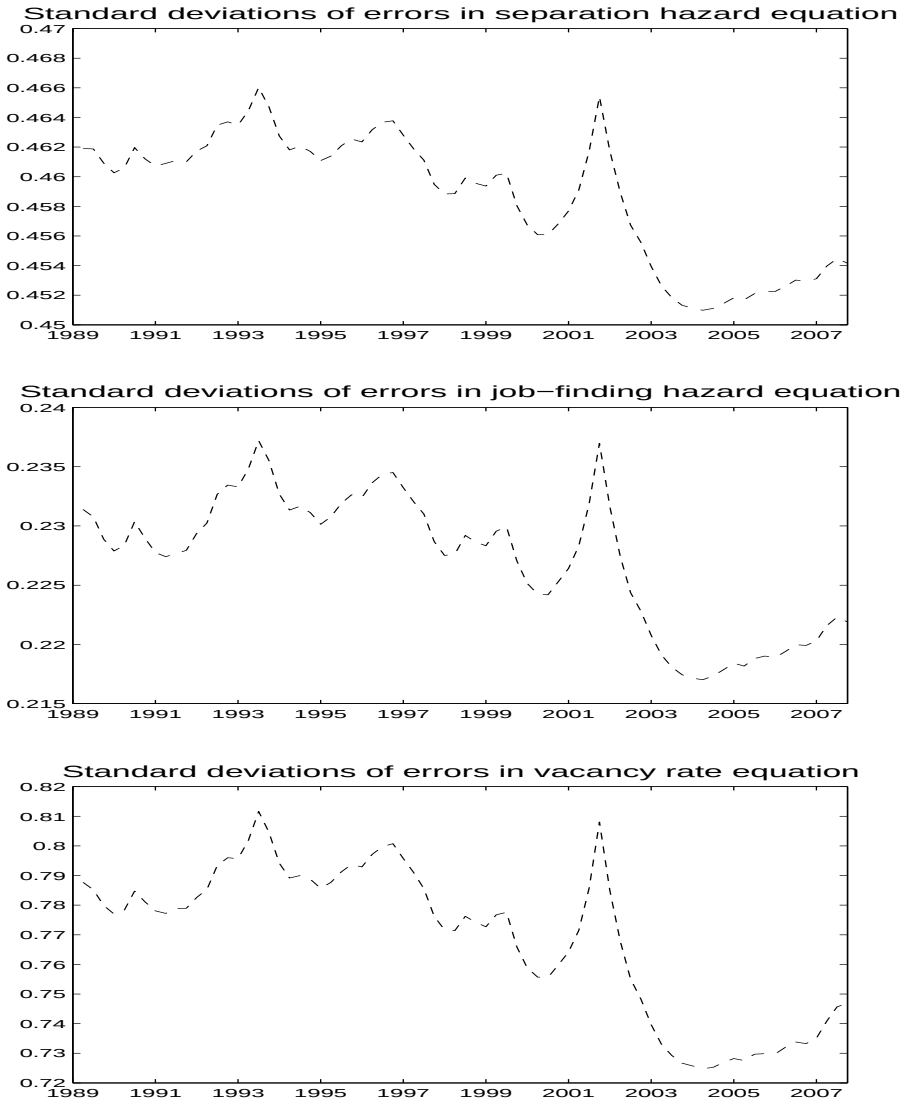


Figure 10. Standard Deviations -*Hete TVP-VAR*, UK

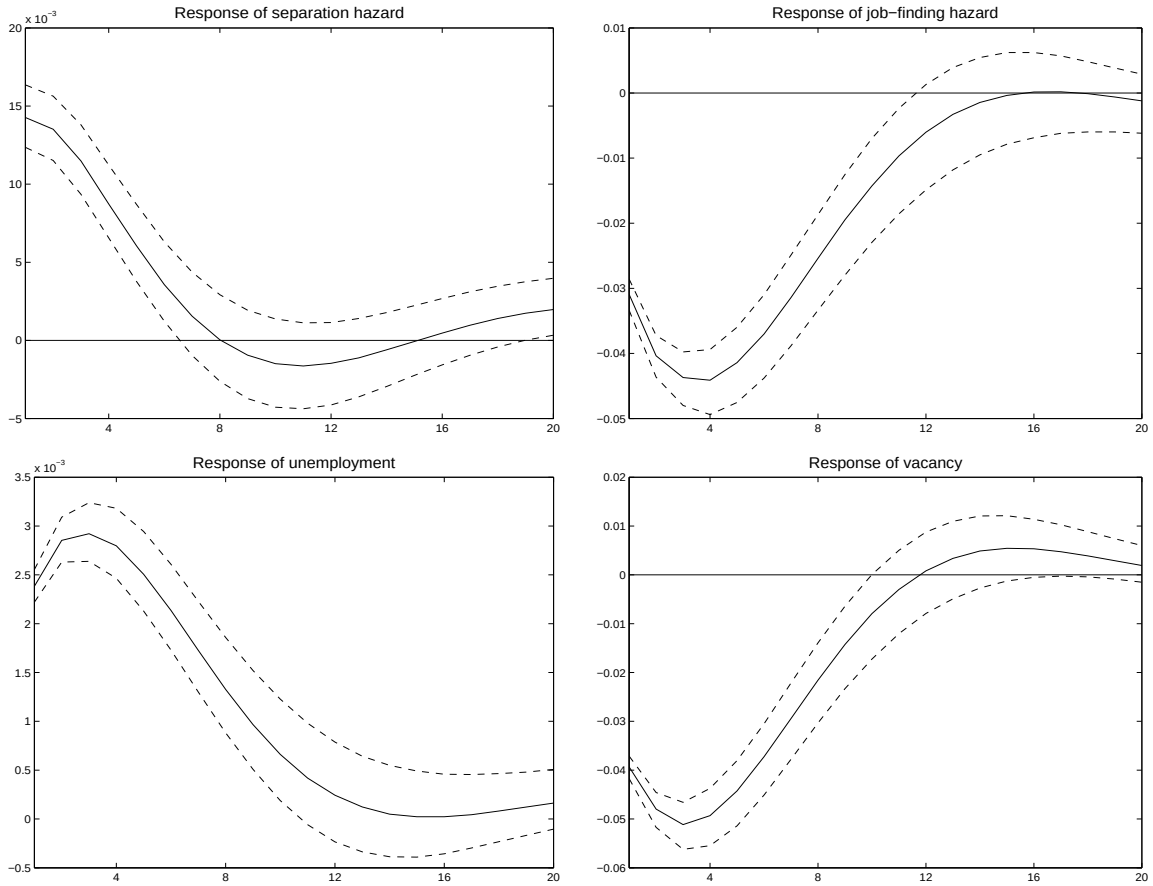


Figure A. 1. Impulse responses - VAR, US

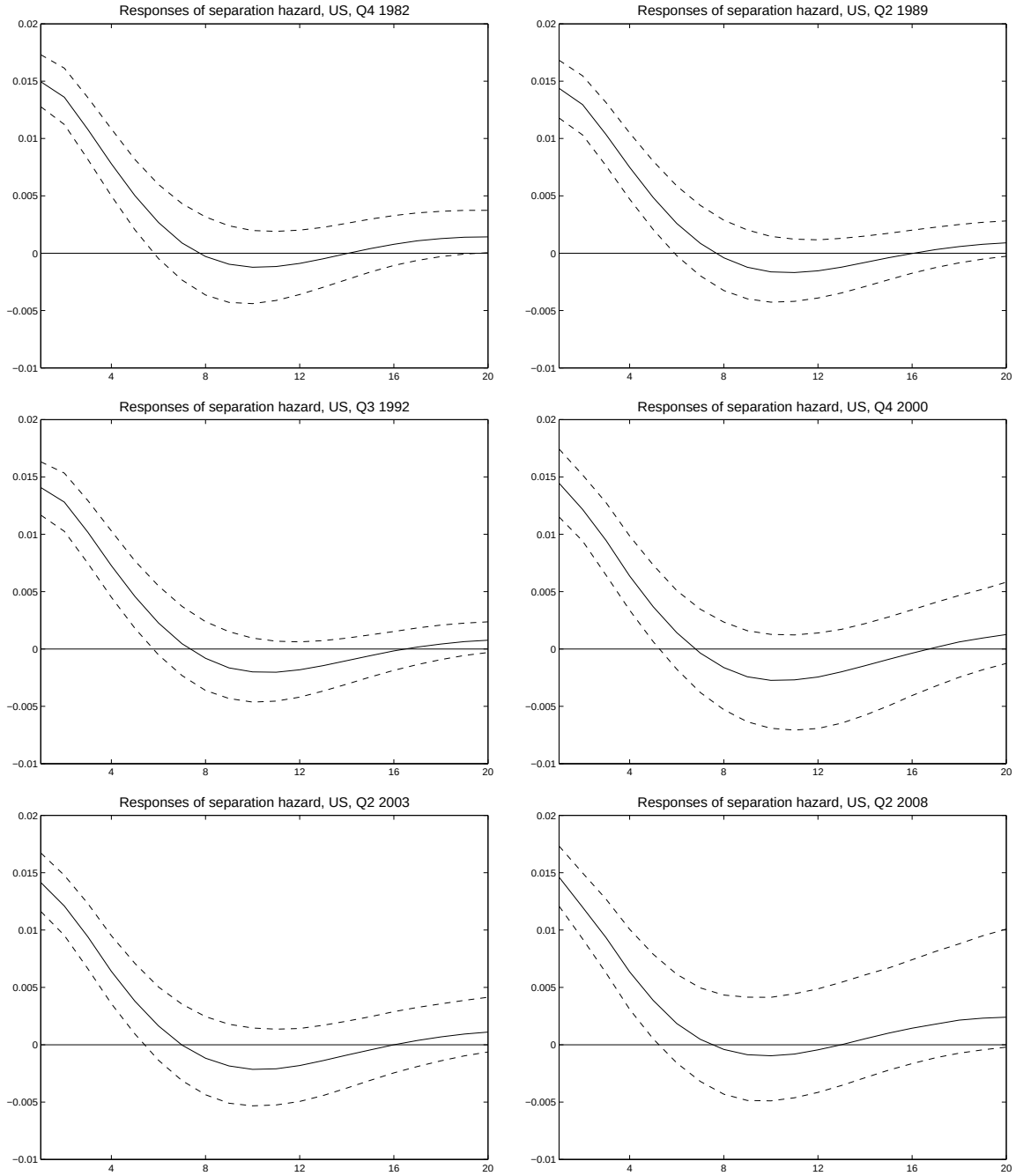


Figure A. 2. Impulse responses of separation hazards -*Homo TVP-VAR*, US

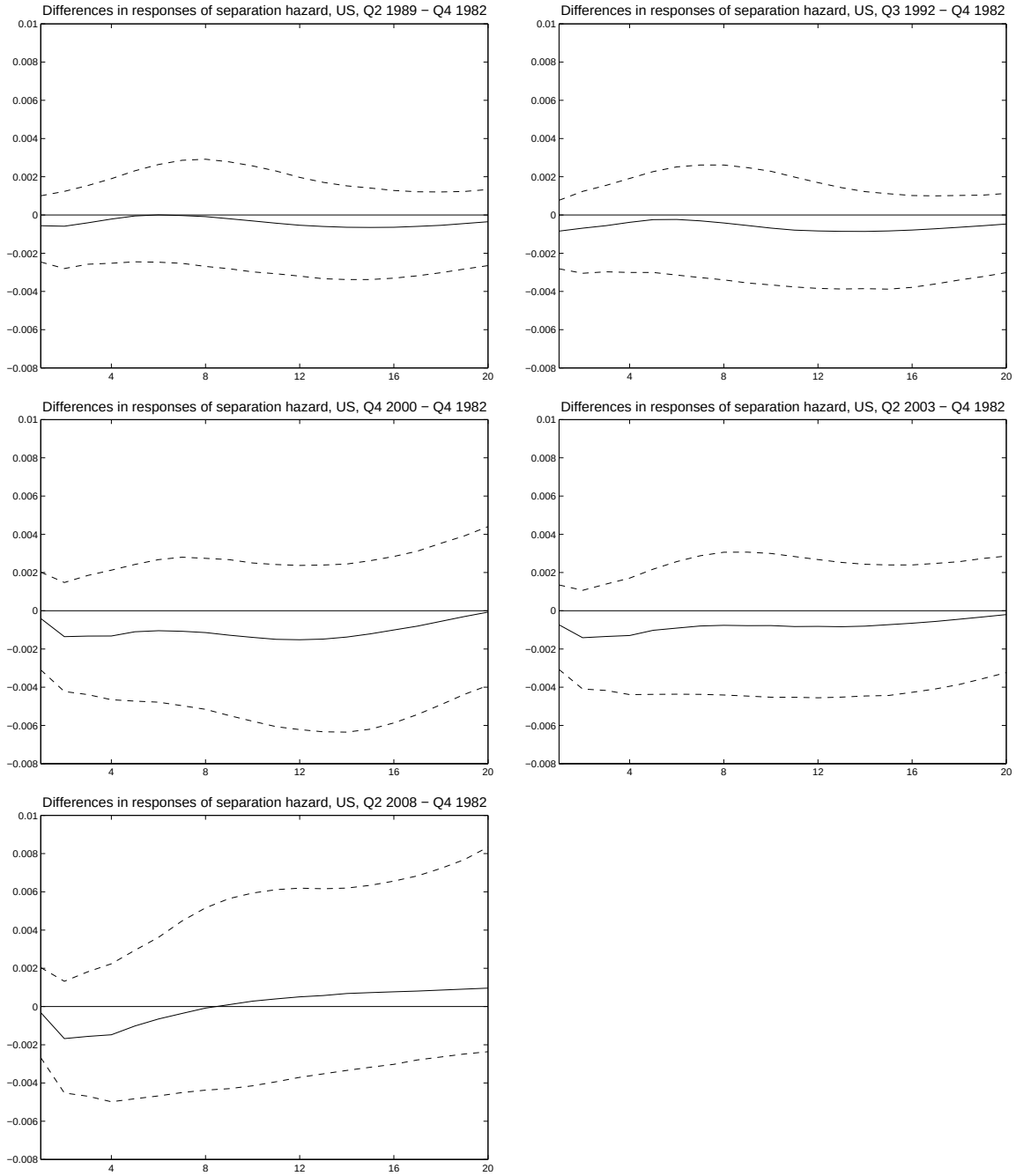


Figure A. 3. Differences in impulse responses of separation hazards -*Homo TVP-VAR*, US

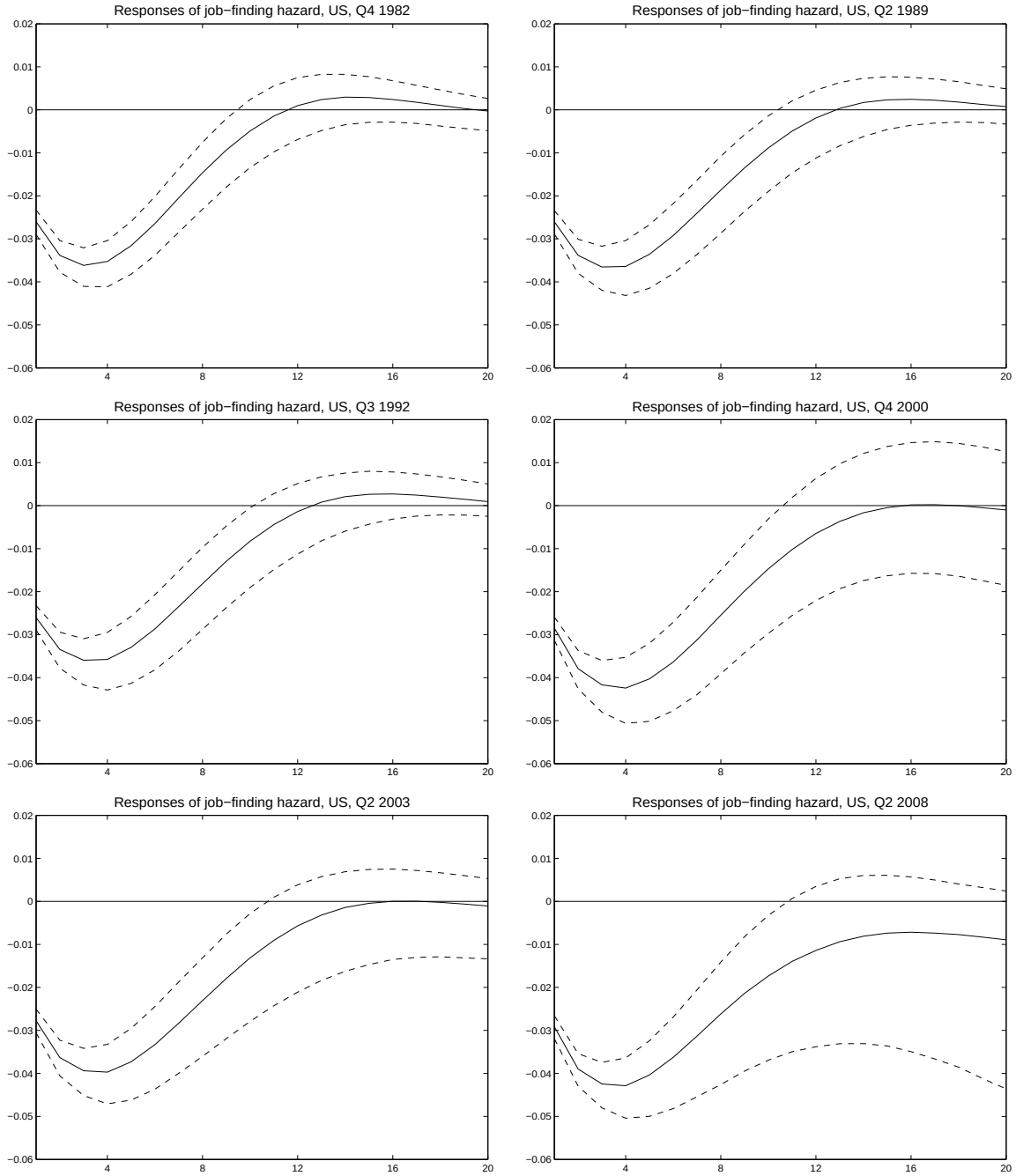


Figure A. 4. Impulse responses of job-finding hazards -*Homo TVP-VAR*, US

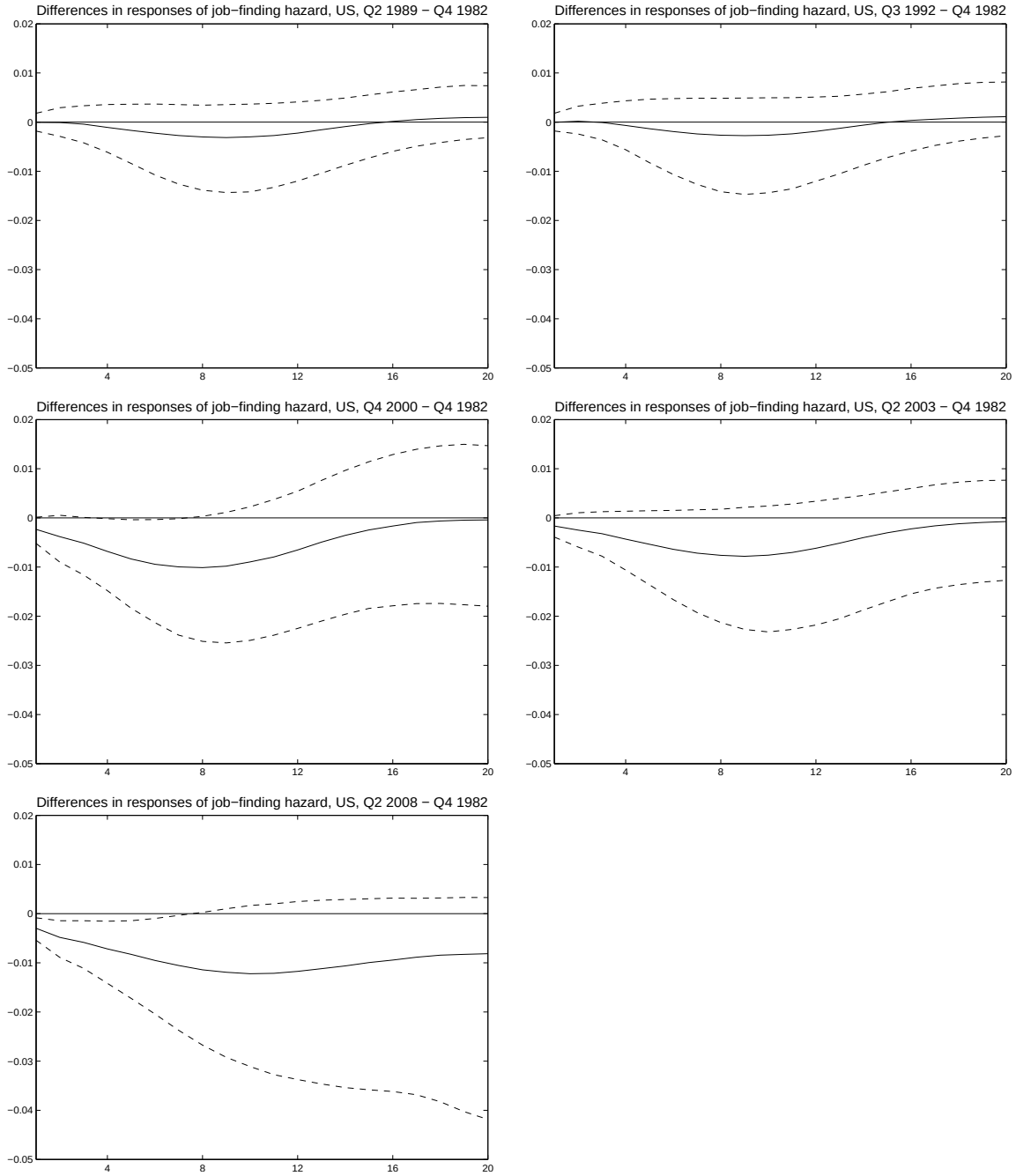


Figure A. 5. Differences in impulse responses of job-finding hazards -*Homo TVP-VAR*, US

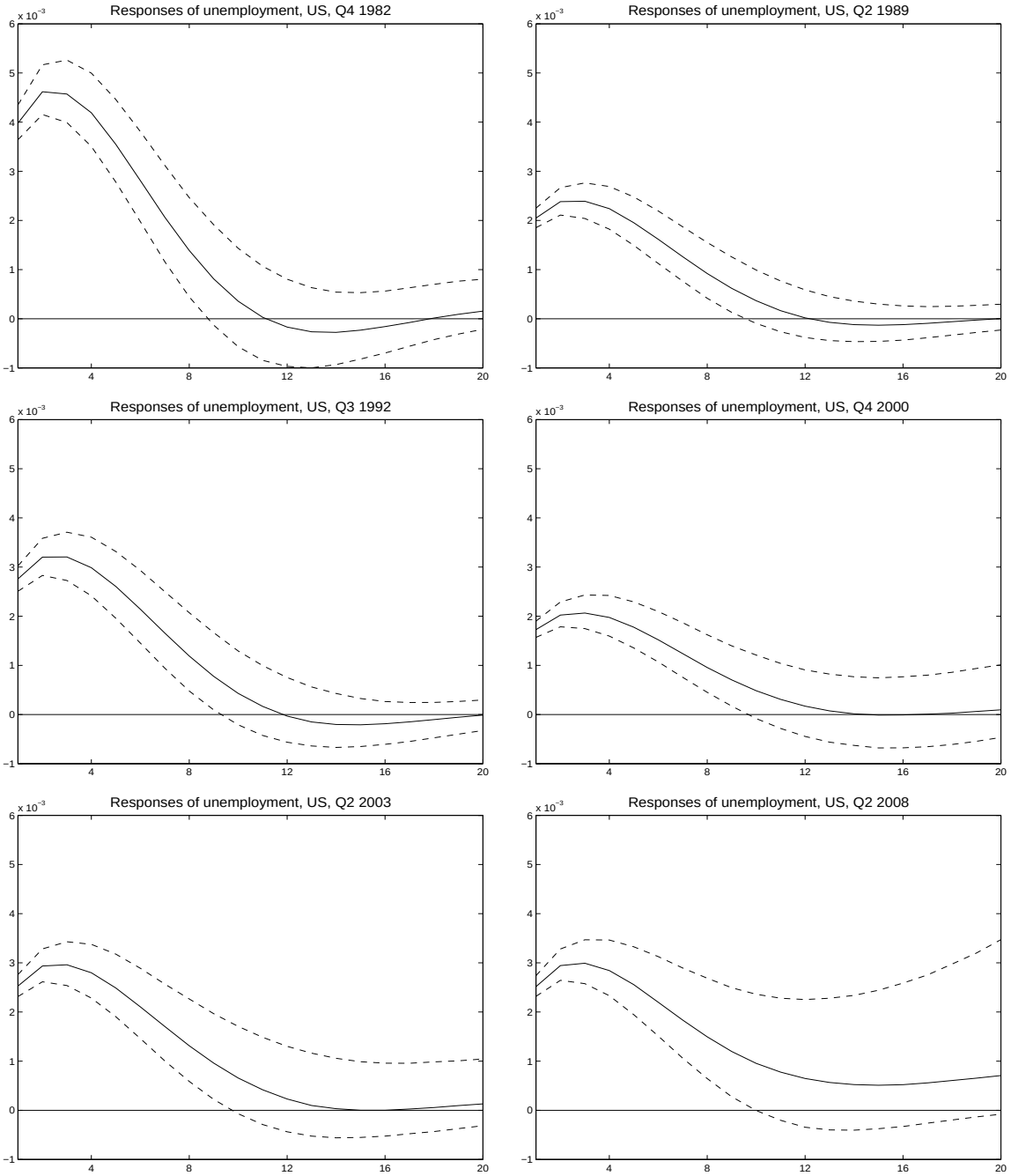


Figure A. 6. Impulse responses of unemployment rates -*Homo TVP-VAR*, US

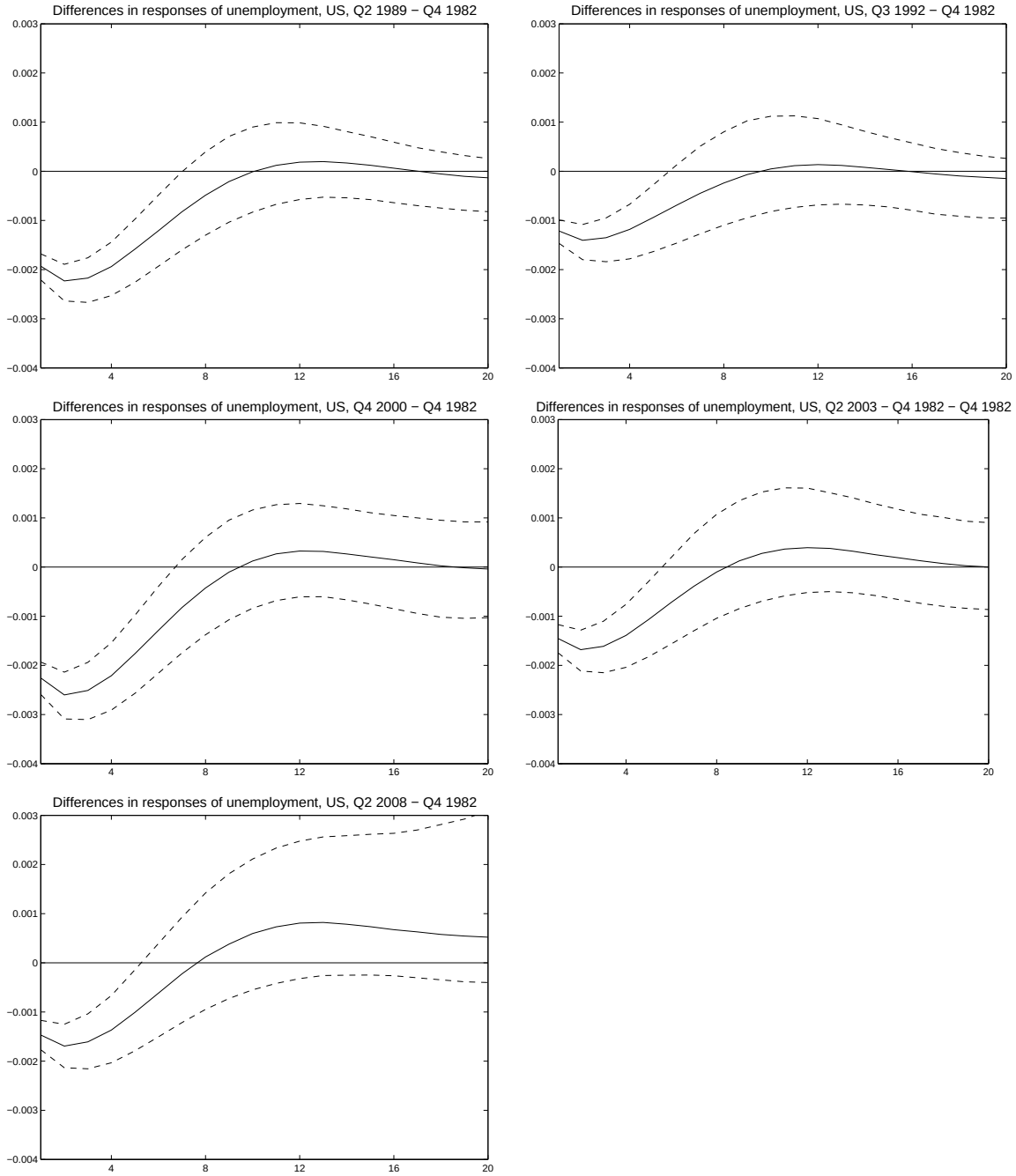


Figure A. 7. Differences in impulse responses of unemployment rates -*Homo TVP-VAR*, US

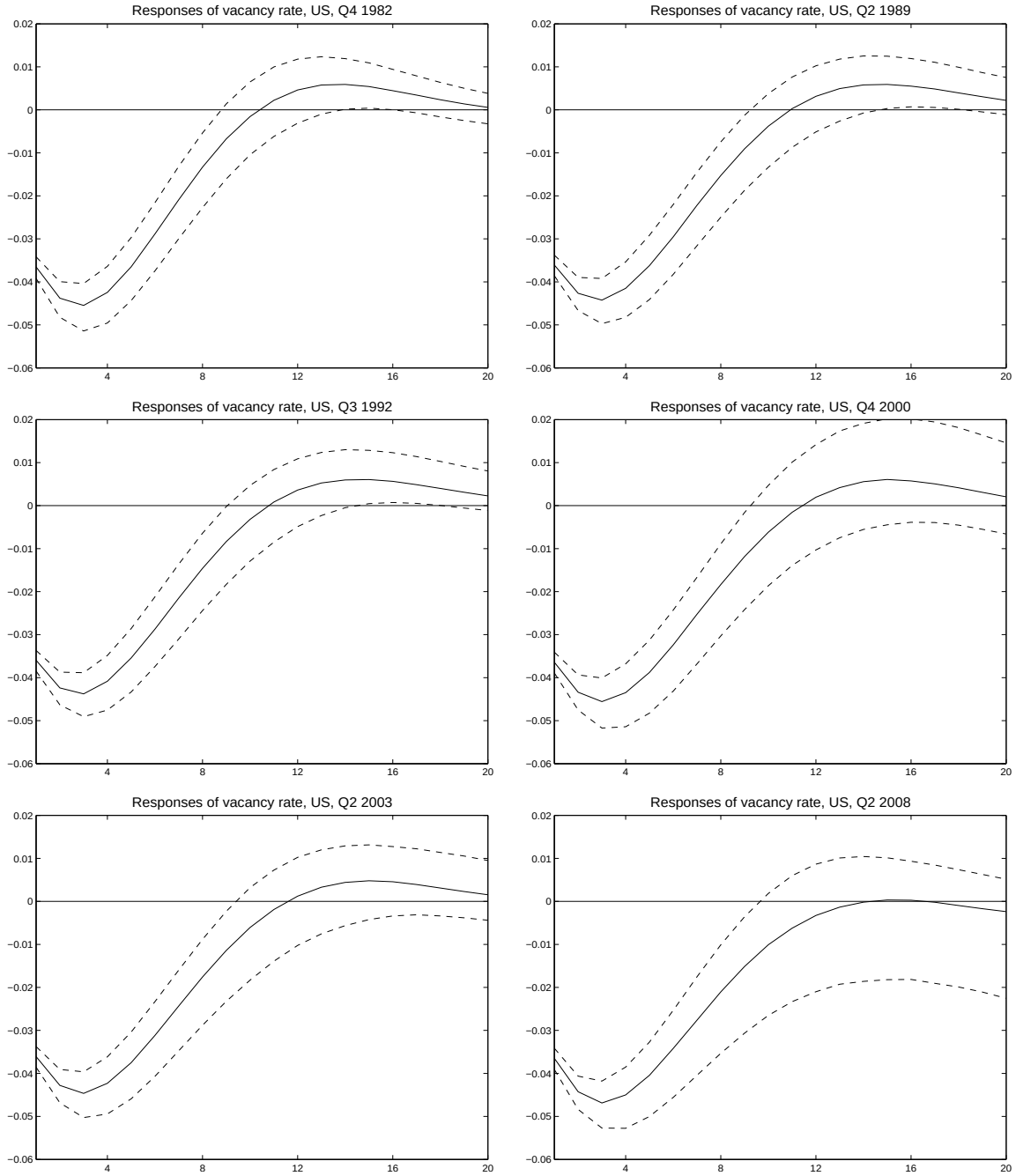


Figure A. 8. Impulse responses of vacancies -*Homo TVP-VAR*, US

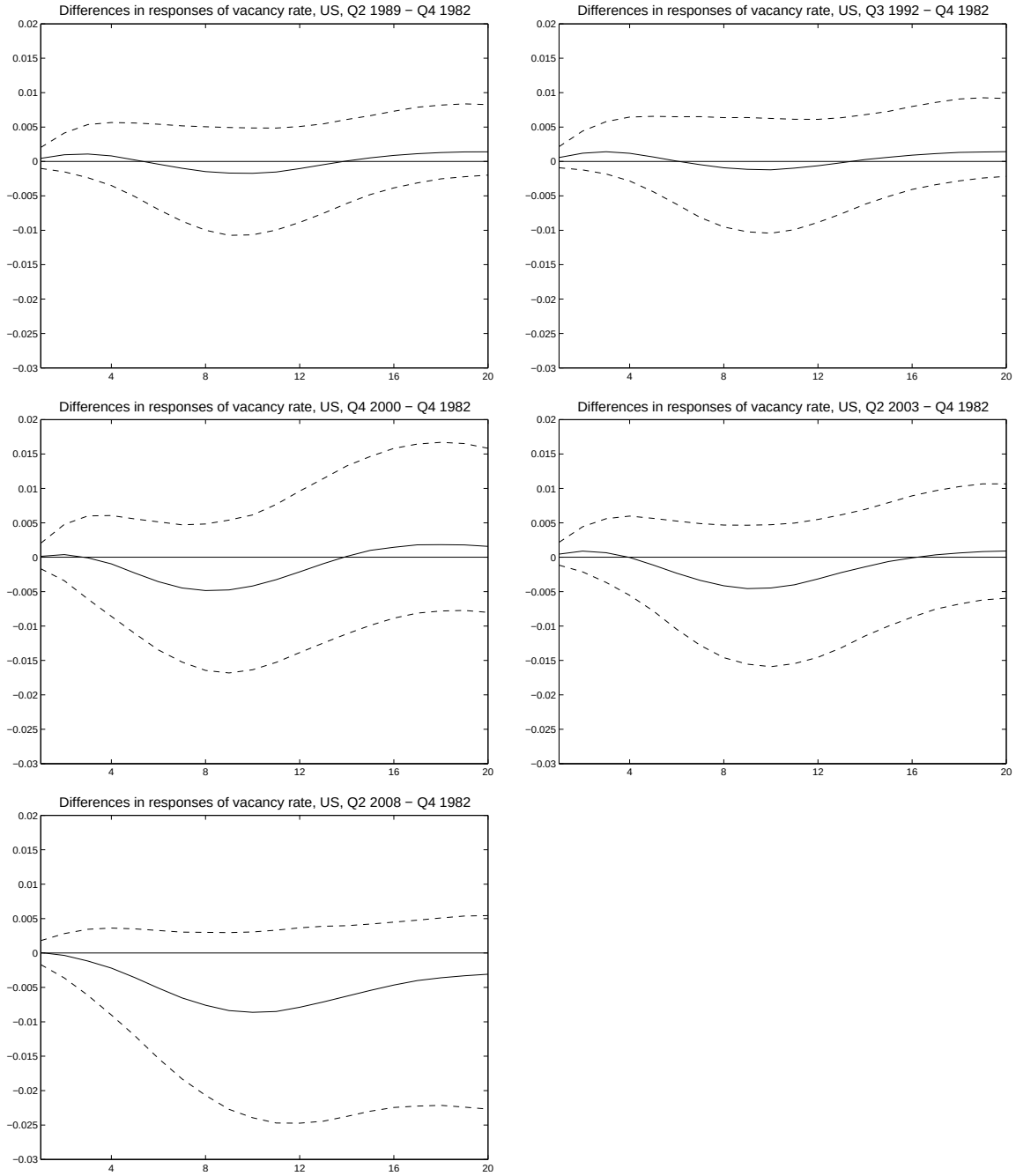


Figure A. 9. Differences in impulse responses of vacancies -*Homo TVP-VAR*, US

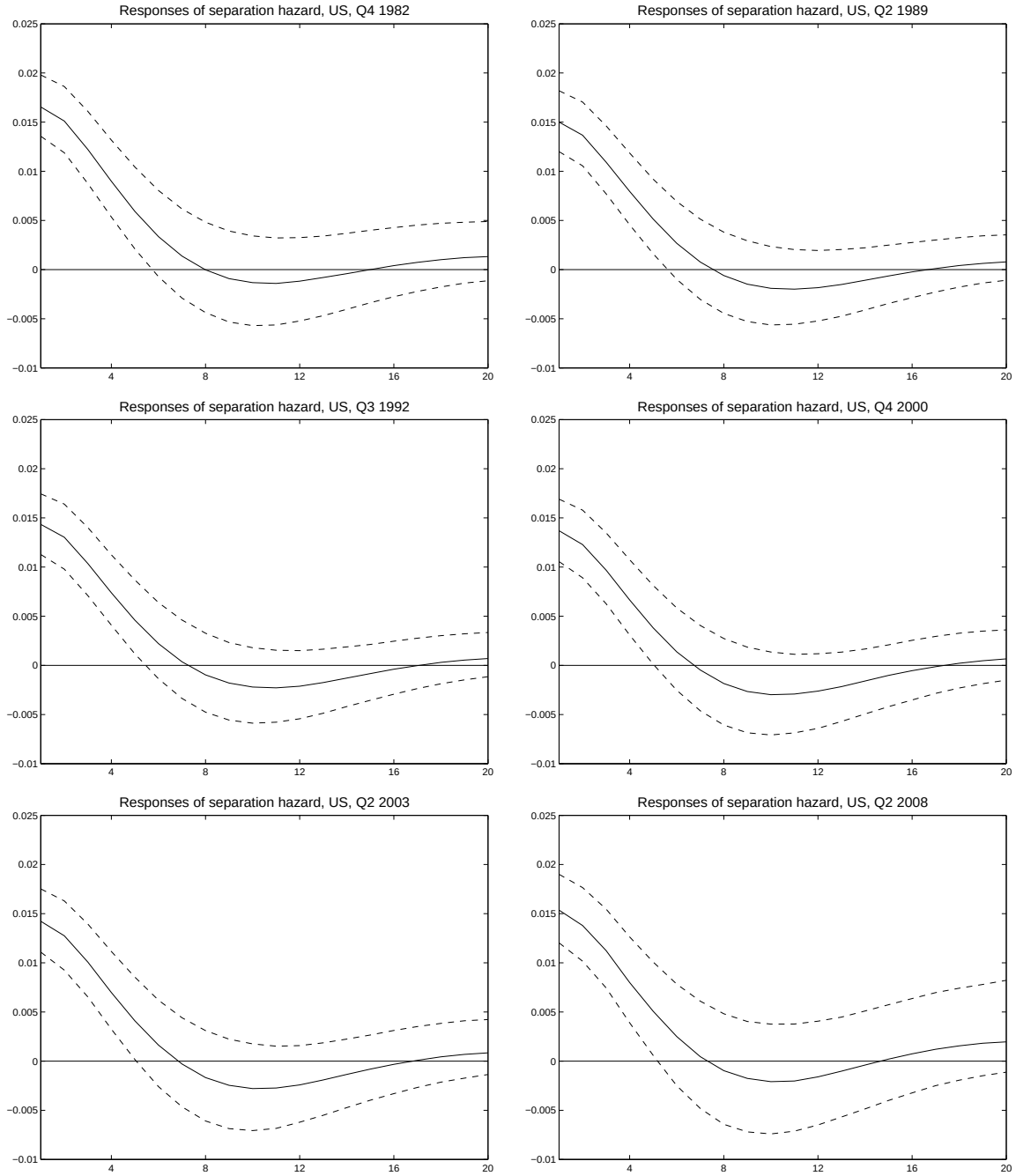


Figure A. 10. Impulse responses of separation hazards -*Hete TVP-VAR*, US

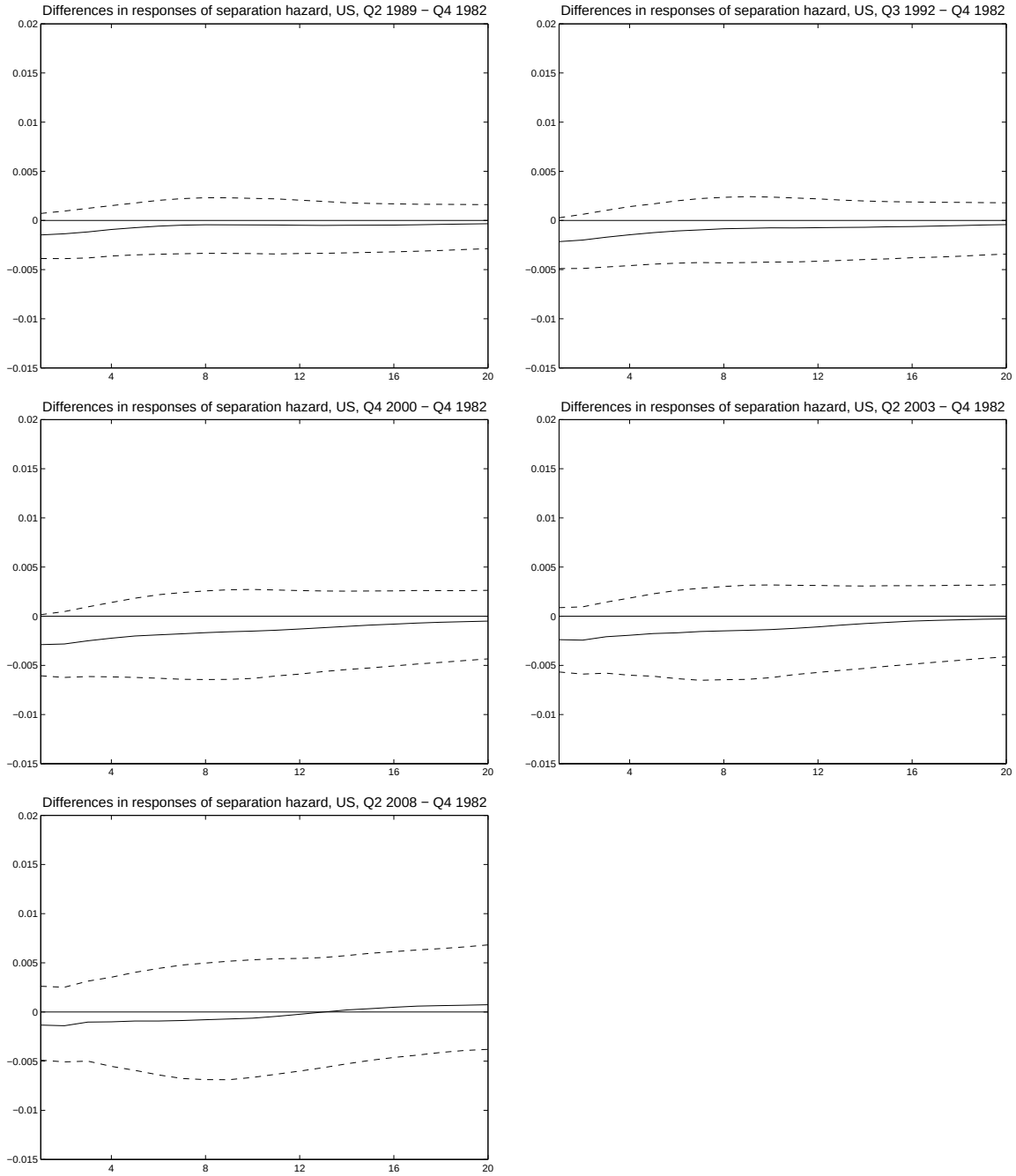


Figure A. 11. Differences in impulse responses of separation hazards -*Hete TVP-VAR*, US

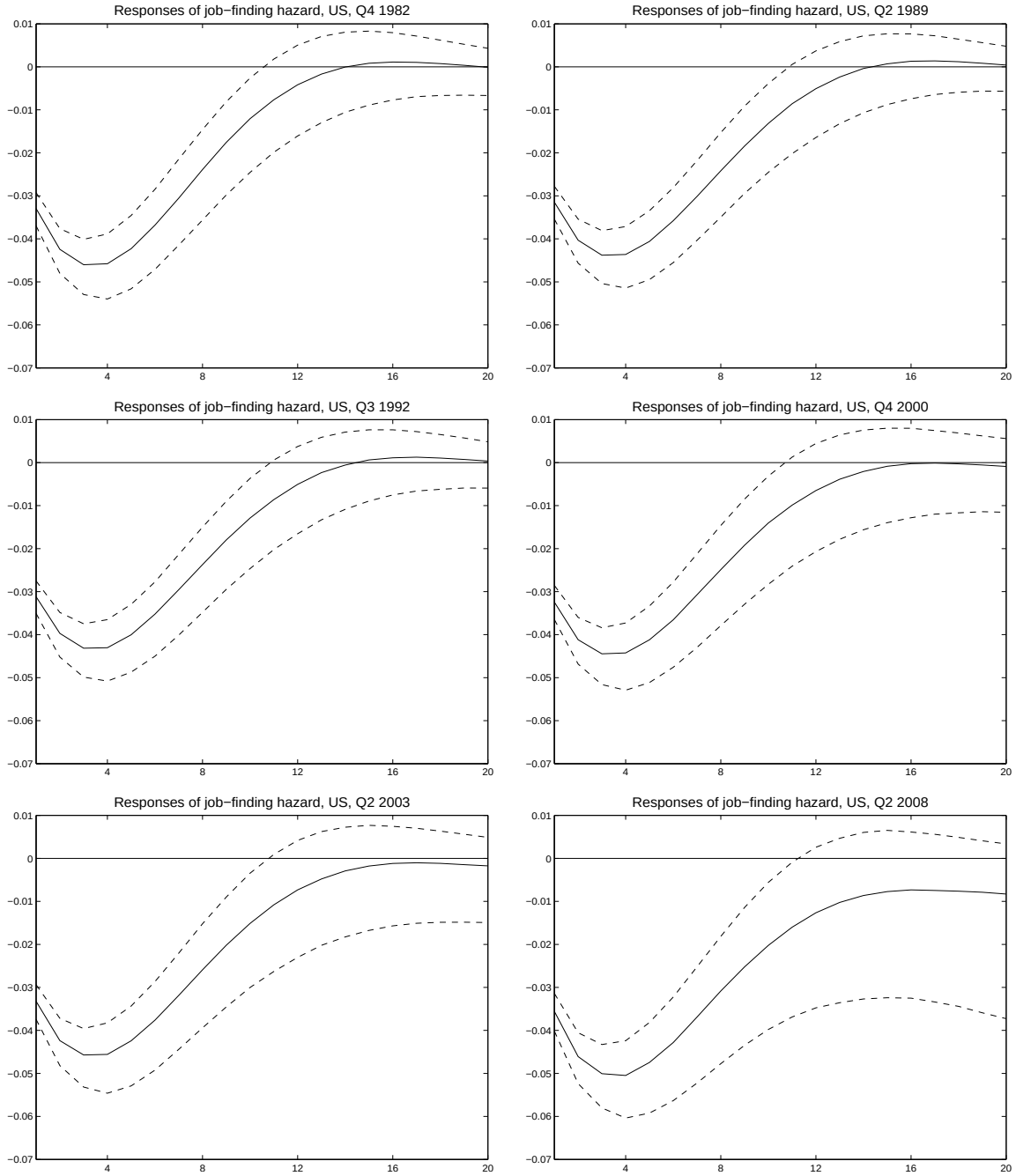


Figure A. 12. Impulse responses of job-finding hazards -*Hete TVP-VAR*, US

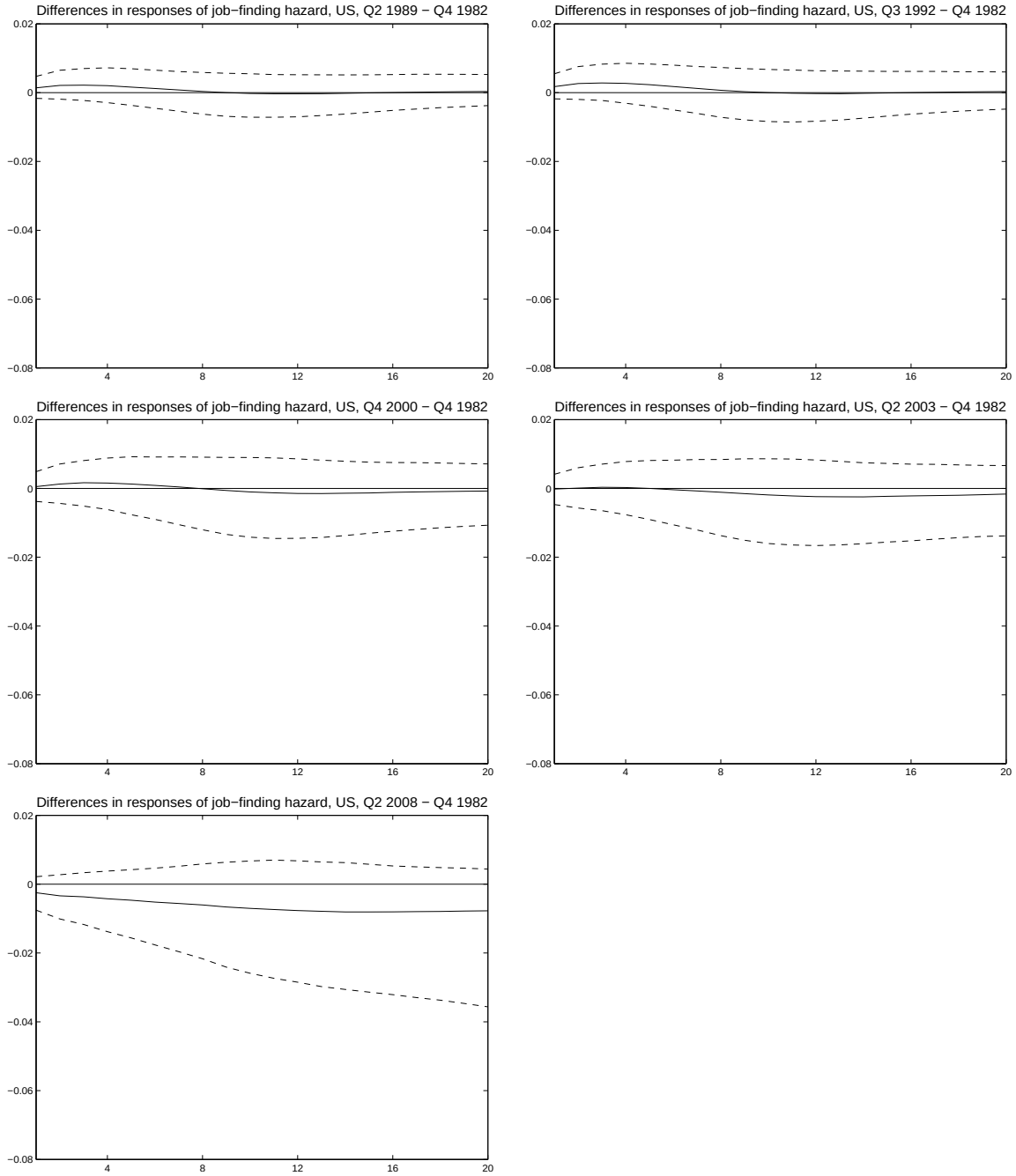


Figure A. 13. Differences in impulse responses of job-finding hazards -*Hete TVP-VAR*, US

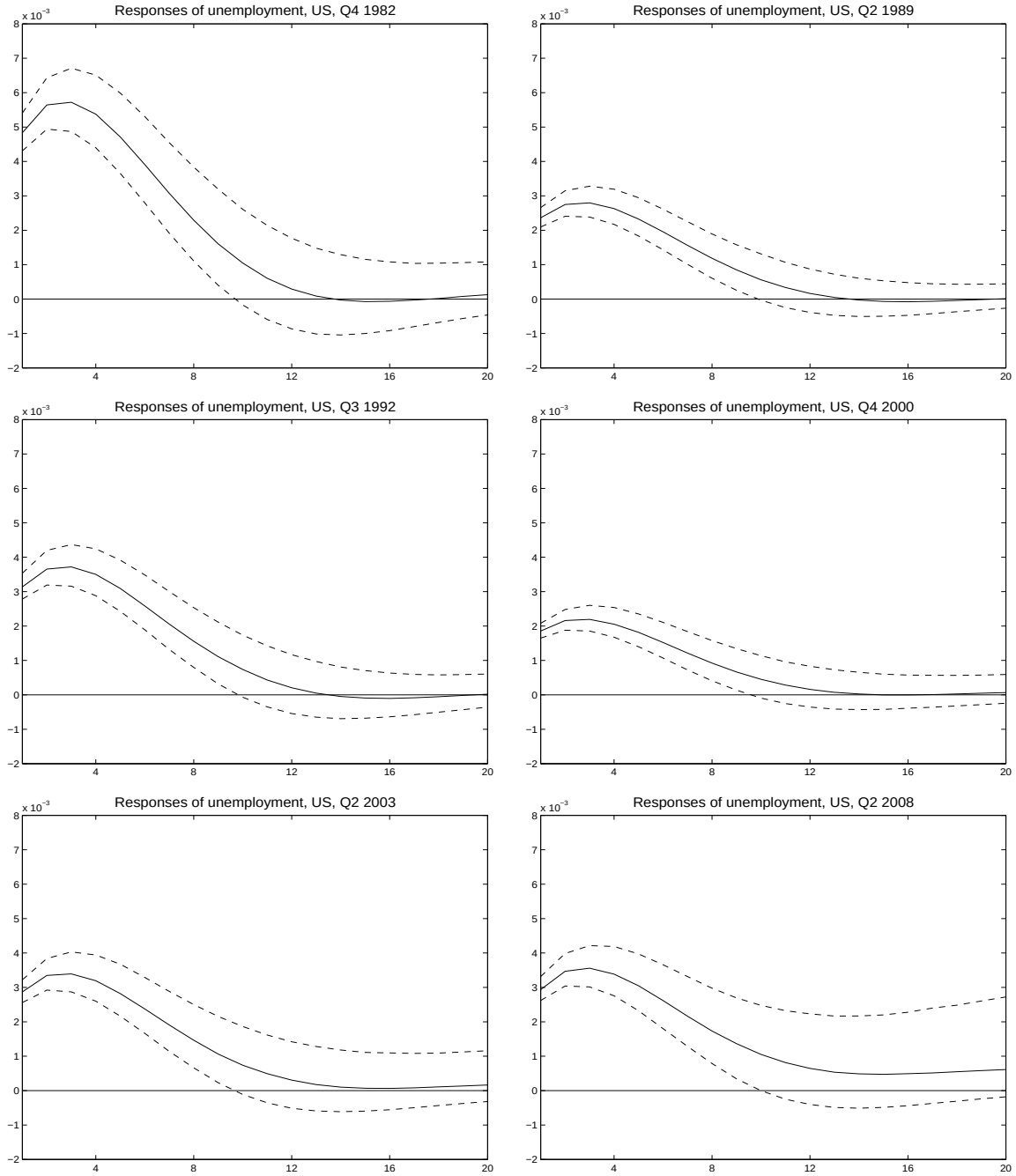


Figure A. 14. Impulse responses of unemployment rates -*Hete TVP-VAR*, US

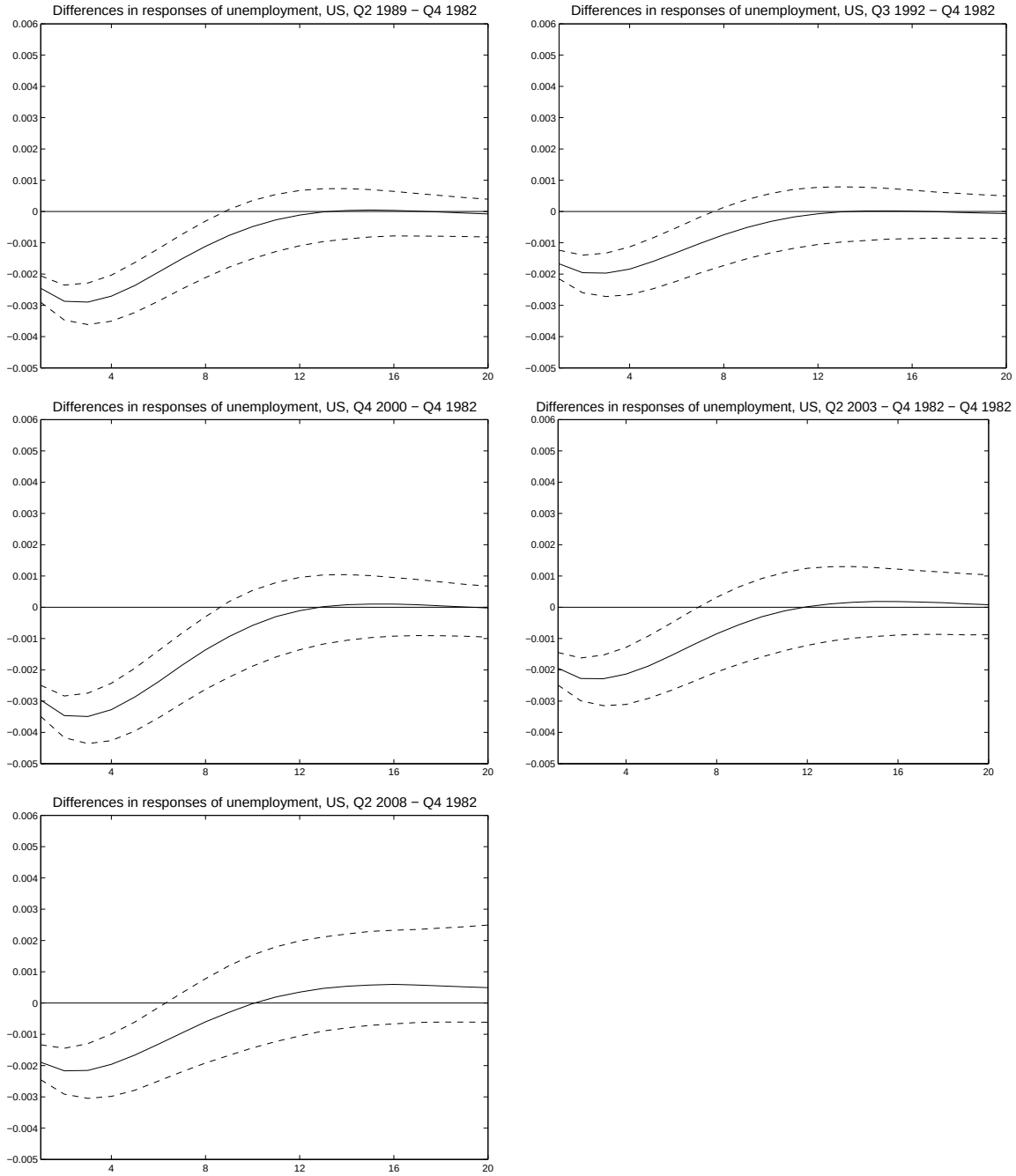


Figure A. 15. Differences in impulse responses of unemployment rates -*Hete TVP-VAR*, US

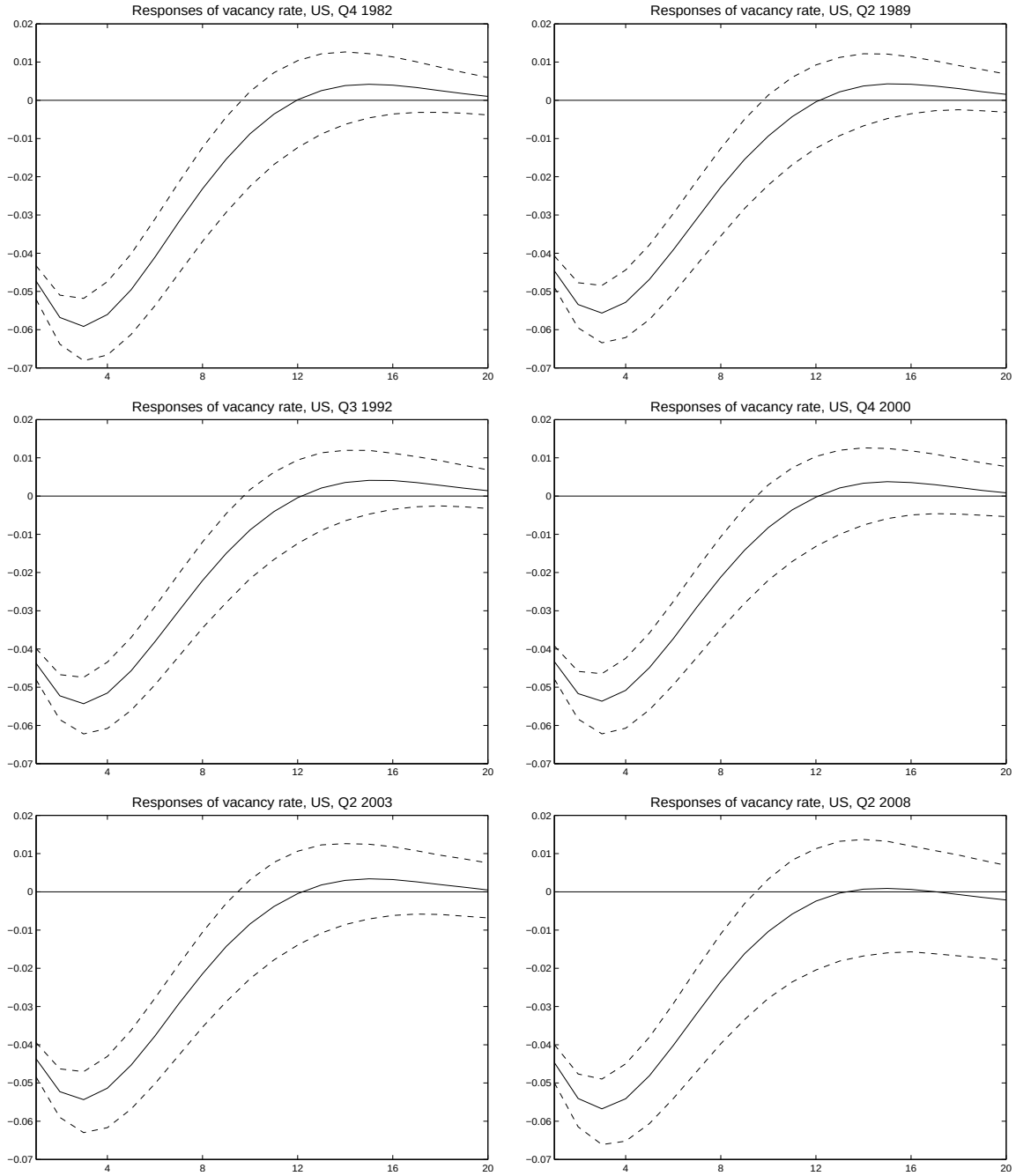


Figure A. 16. Impulse responses of vacancies -*Hete TVP-VAR*, US

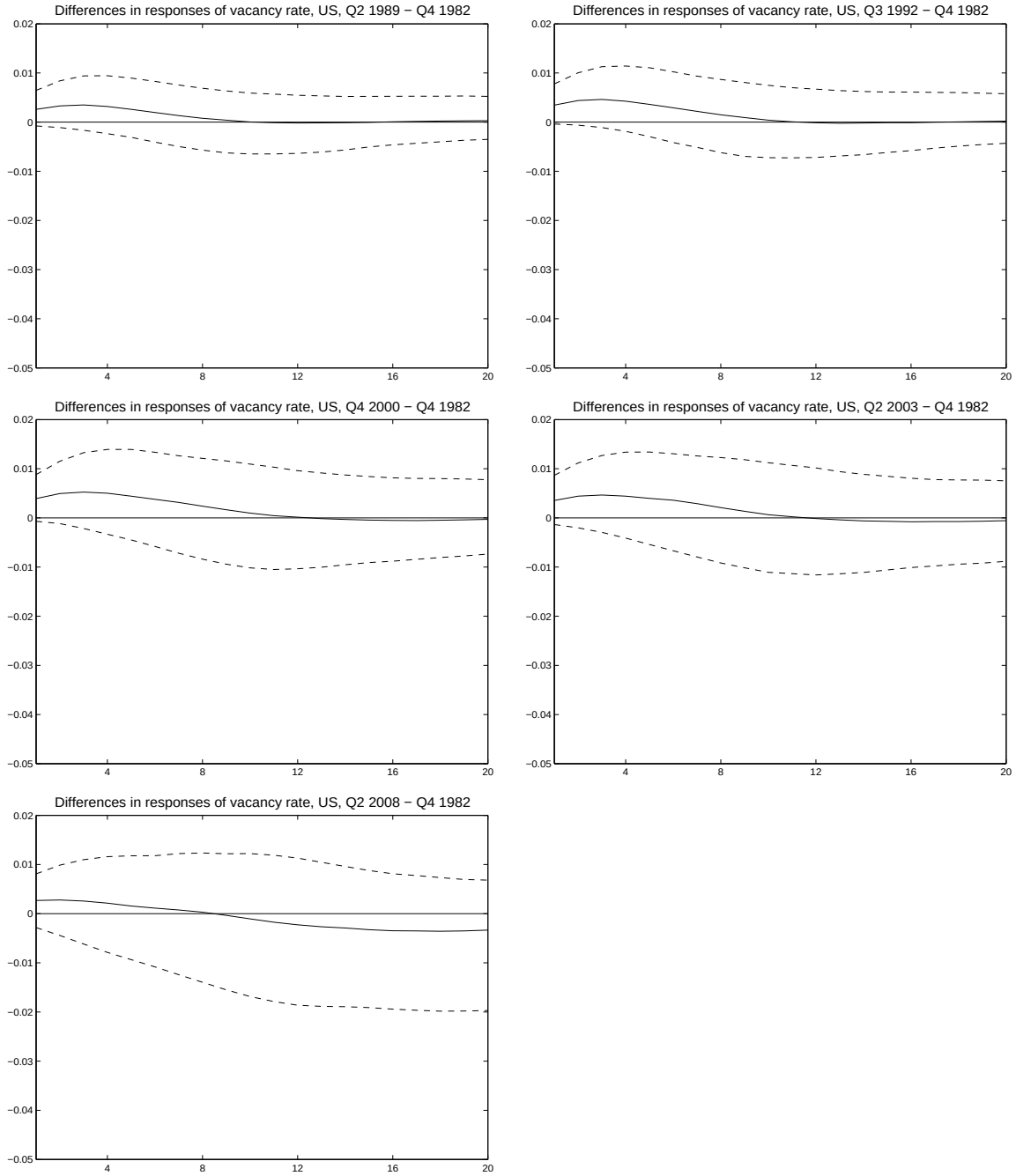


Figure A. 17. Differences in impulse responses of vacancies -*Hete TVP-VAR*, US

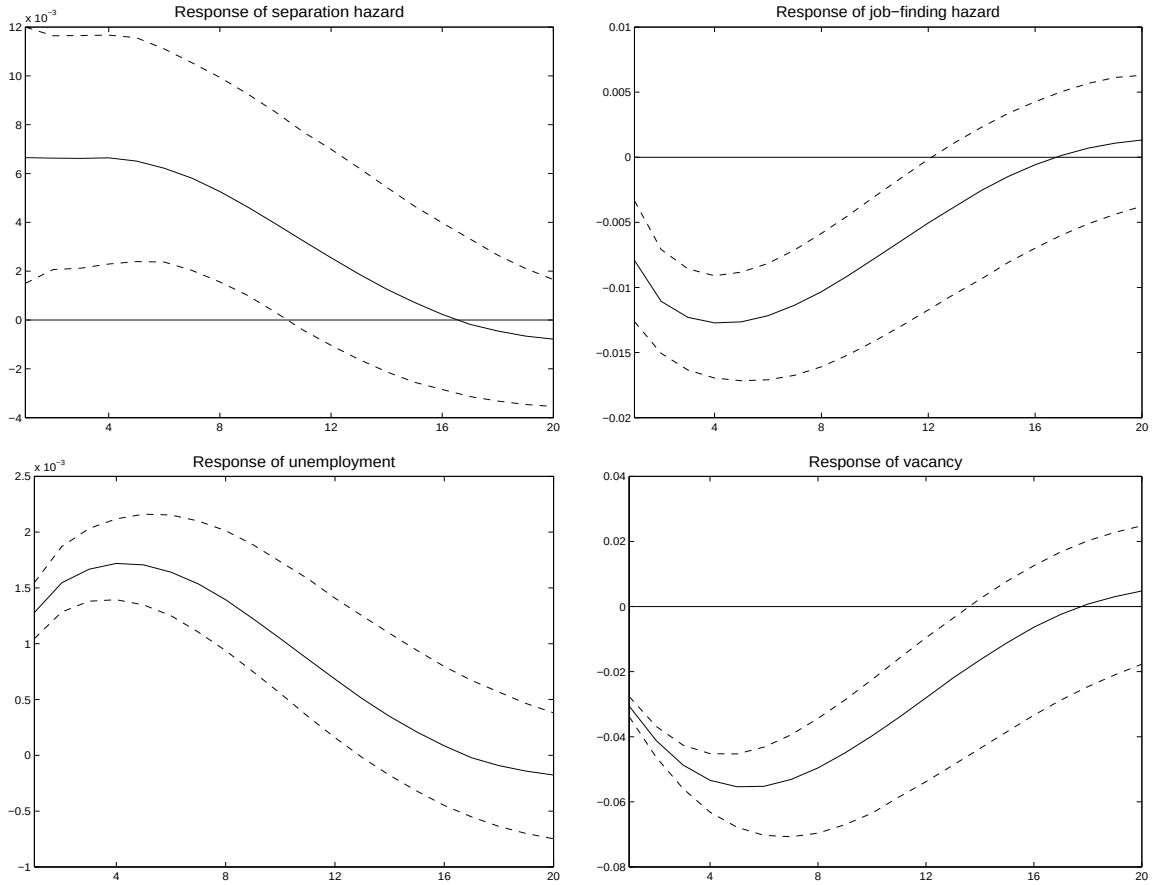


Figure A. 18. Impulse responses - VAR, Canada

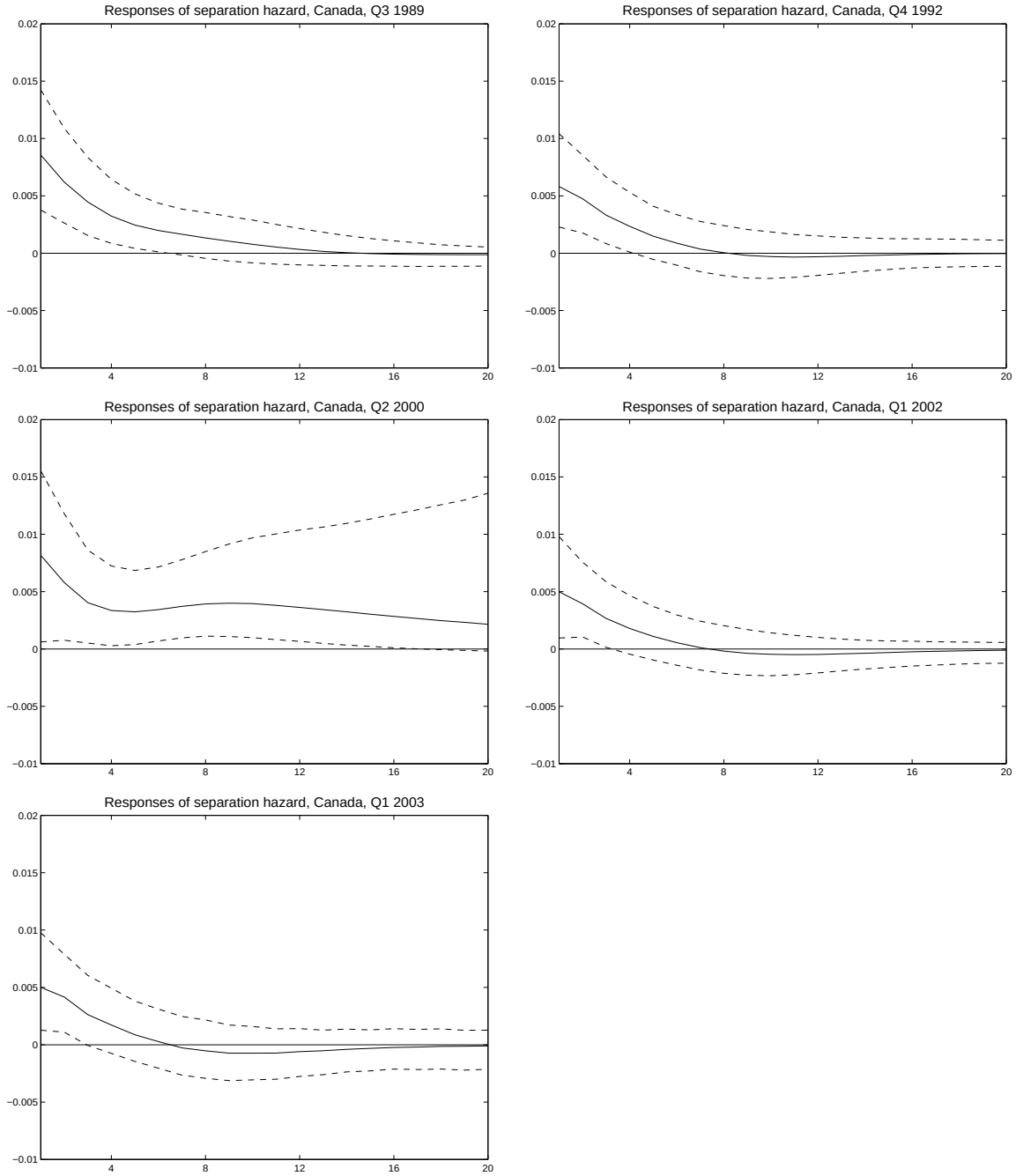


Figure A. 19. Impulse responses of separation hazards -*Homo TVP-VAR*, Canada

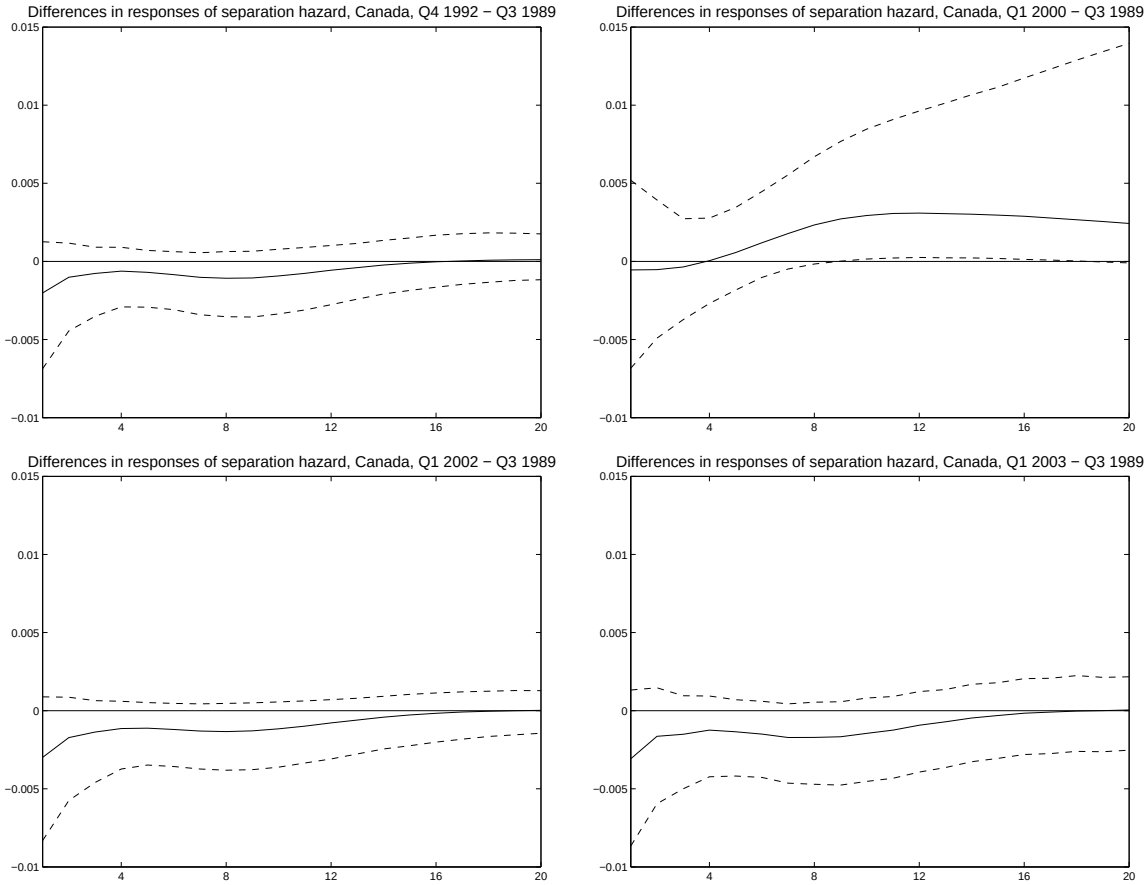


Figure A. 20. Differences in impulse responses of separation hazards -*Homo TVP-VAR*, Canada

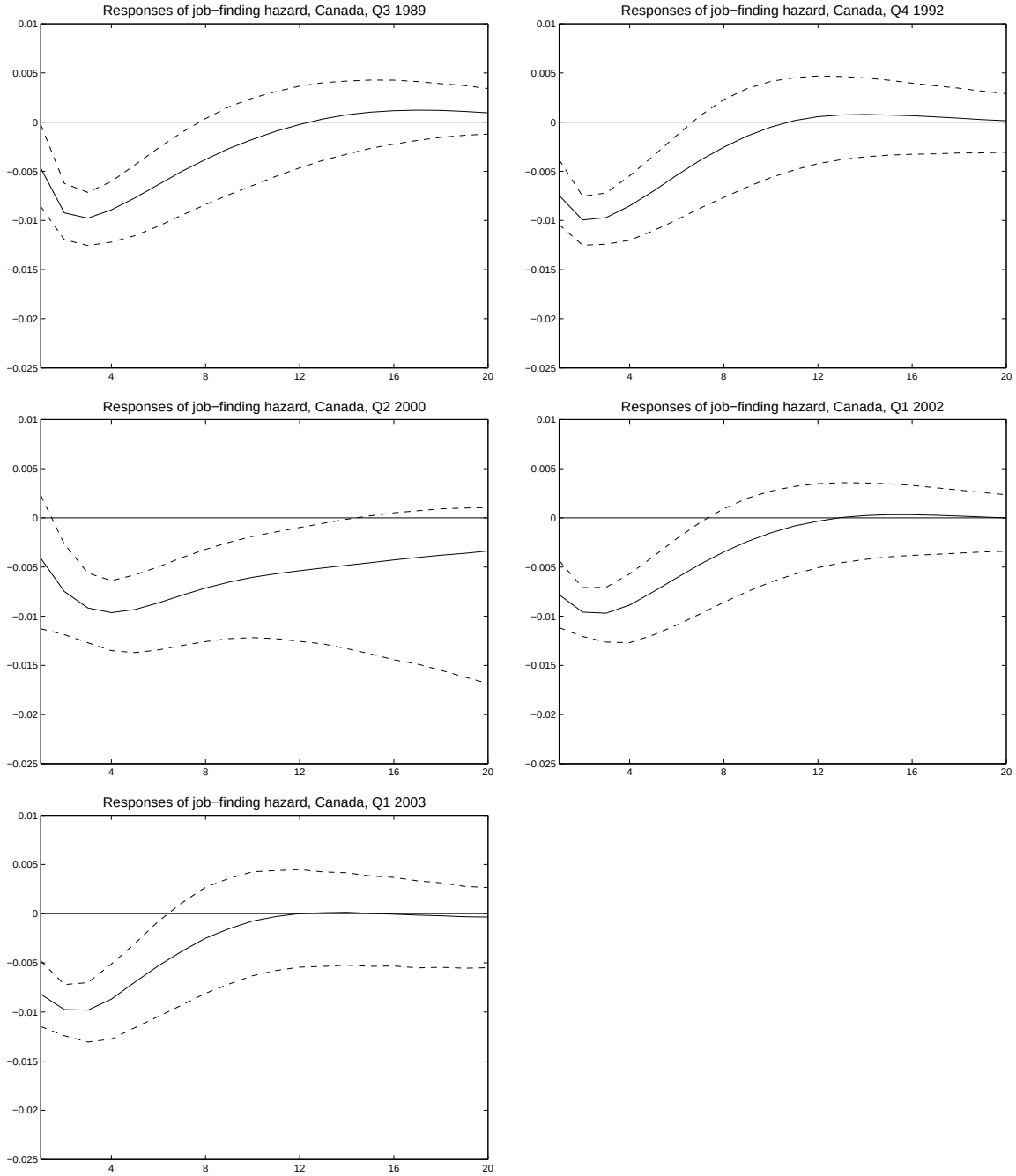


Figure A. 21. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada

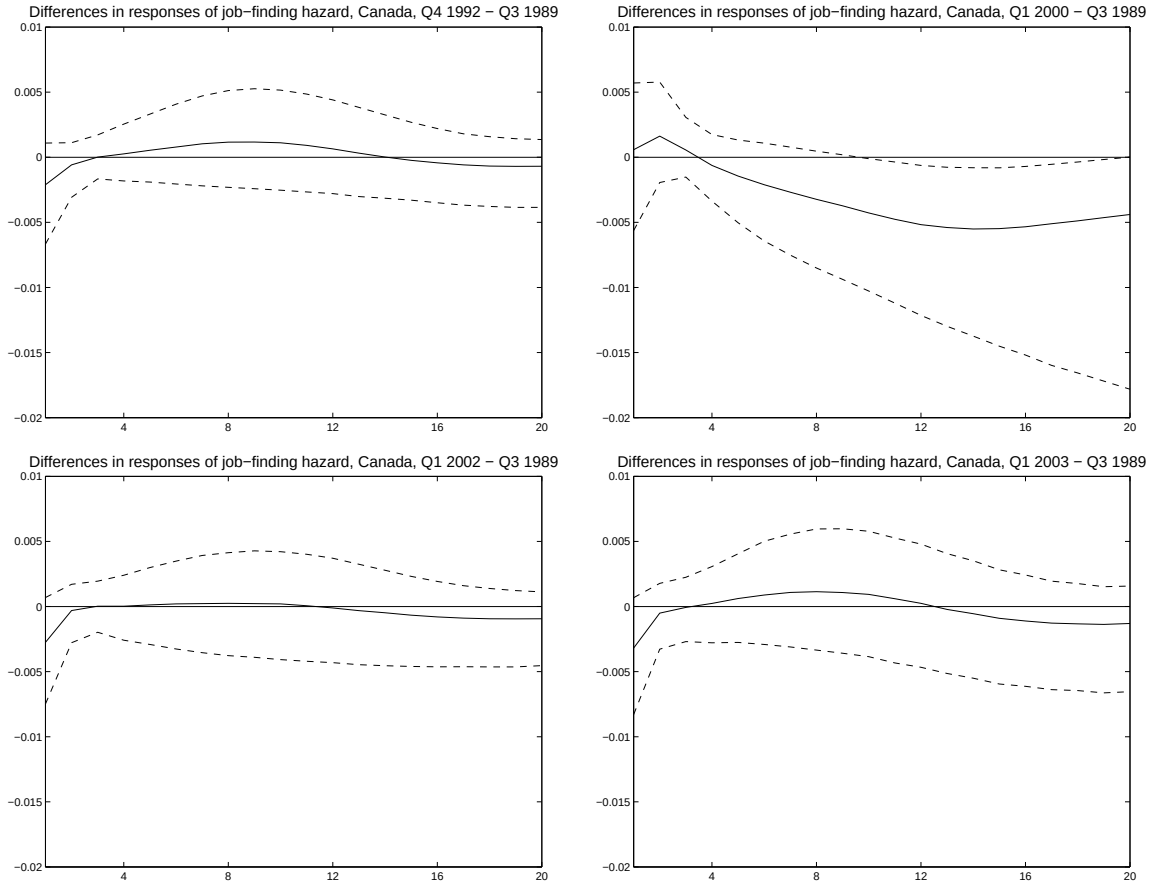


Figure A. 22. Differences in impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada

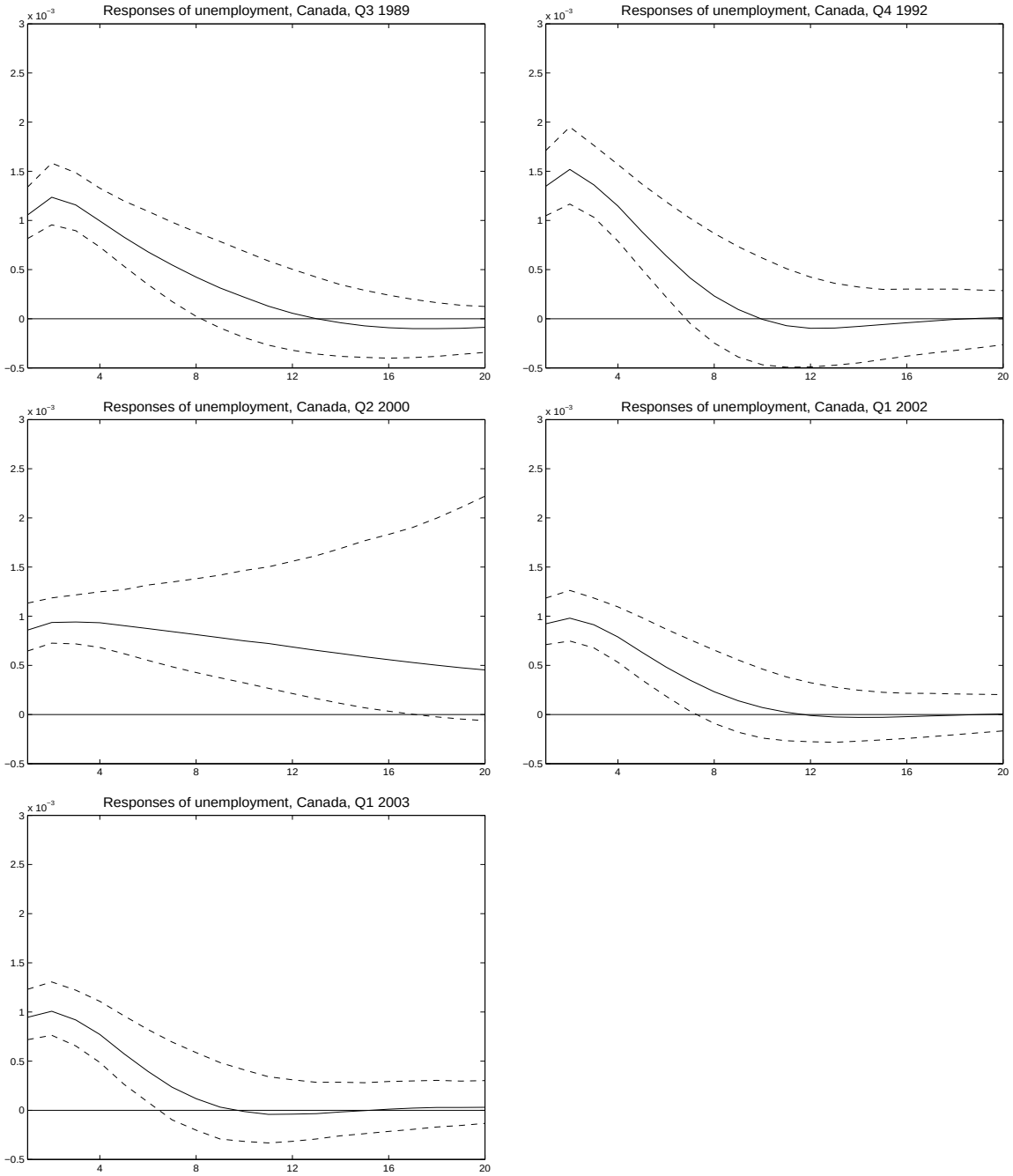


Figure A. 23. Impulse responses of unemployment rates -*Homo TVP-VAR*, Canada

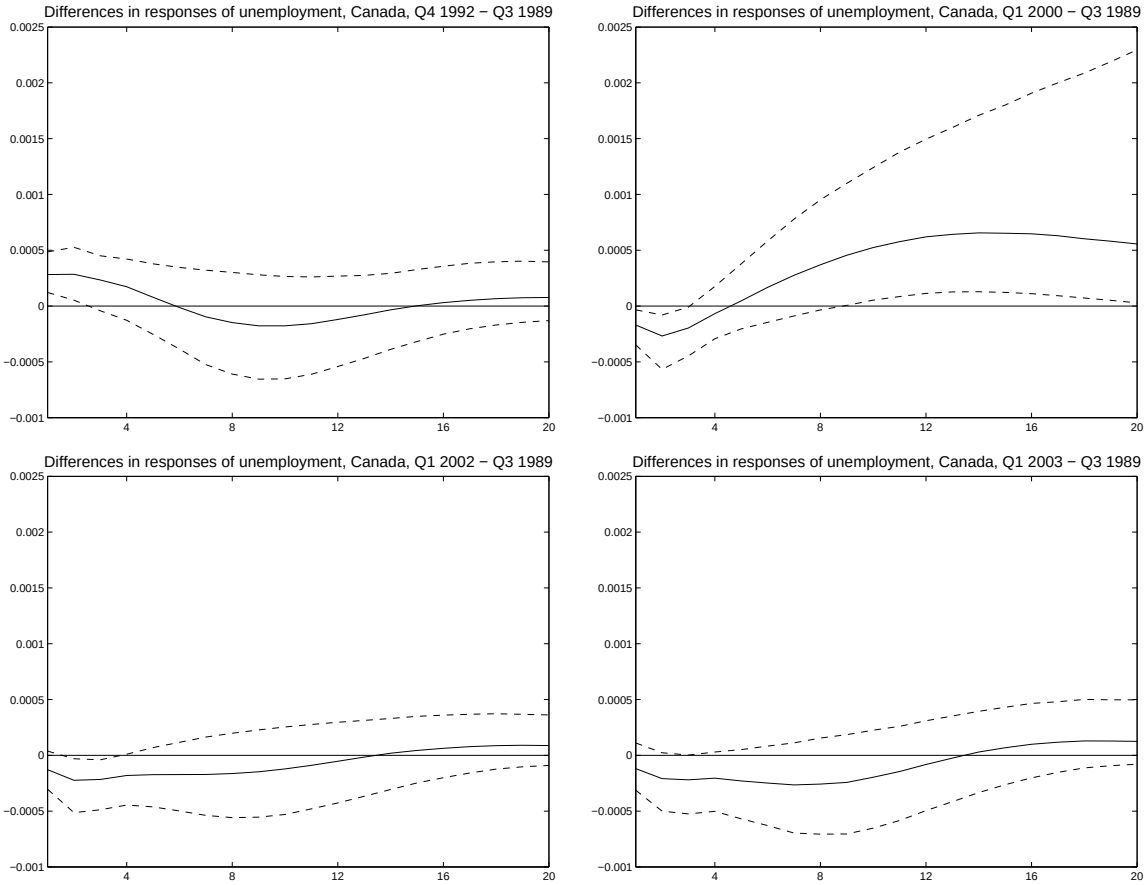


Figure A. 24. Differences in impulse responses of unemployment rates -*Homo TVP-VAR*, Canada

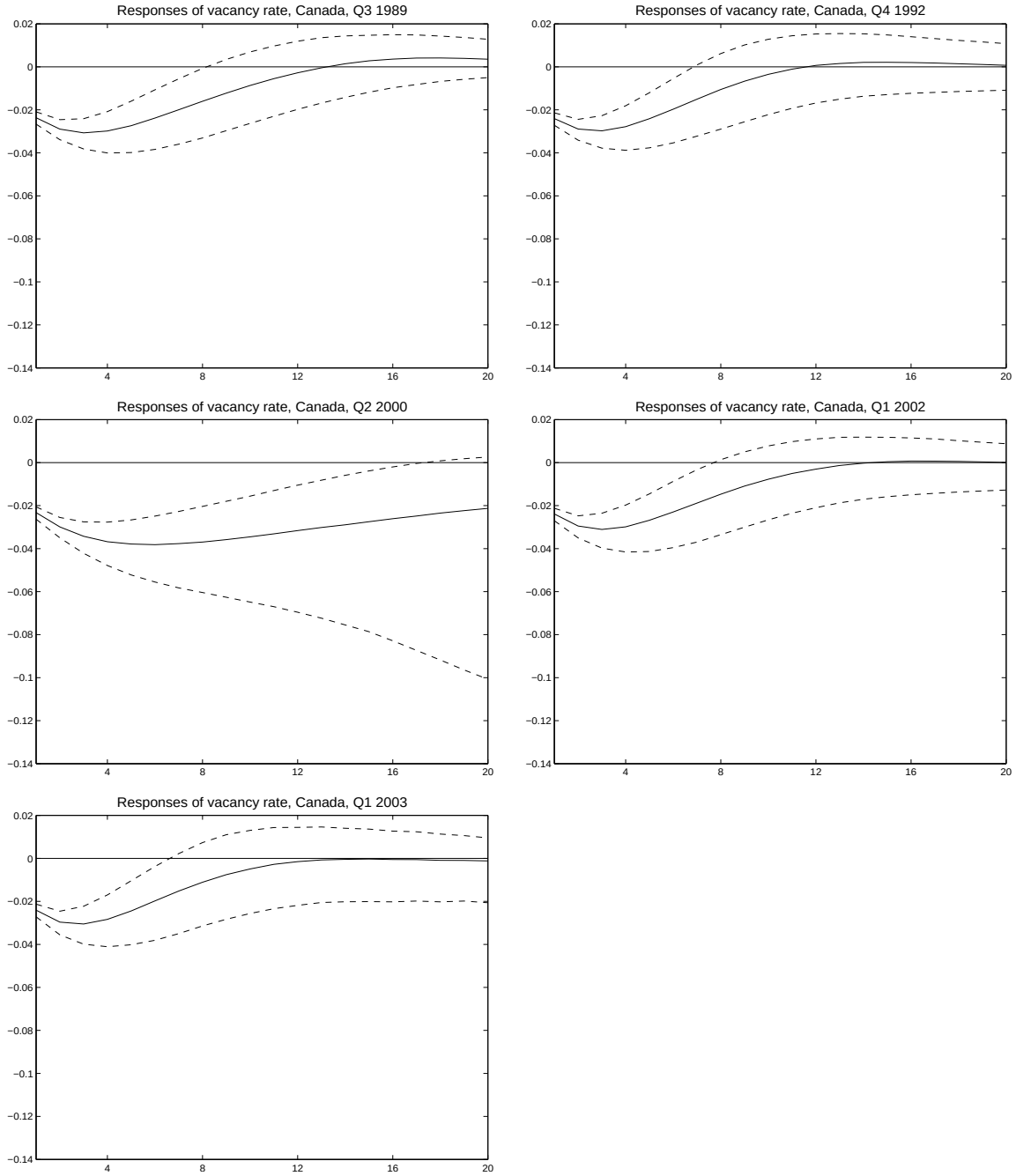


Figure A. 25. Impulse responses of vacancies -*Homo TVP-VAR*, Canada

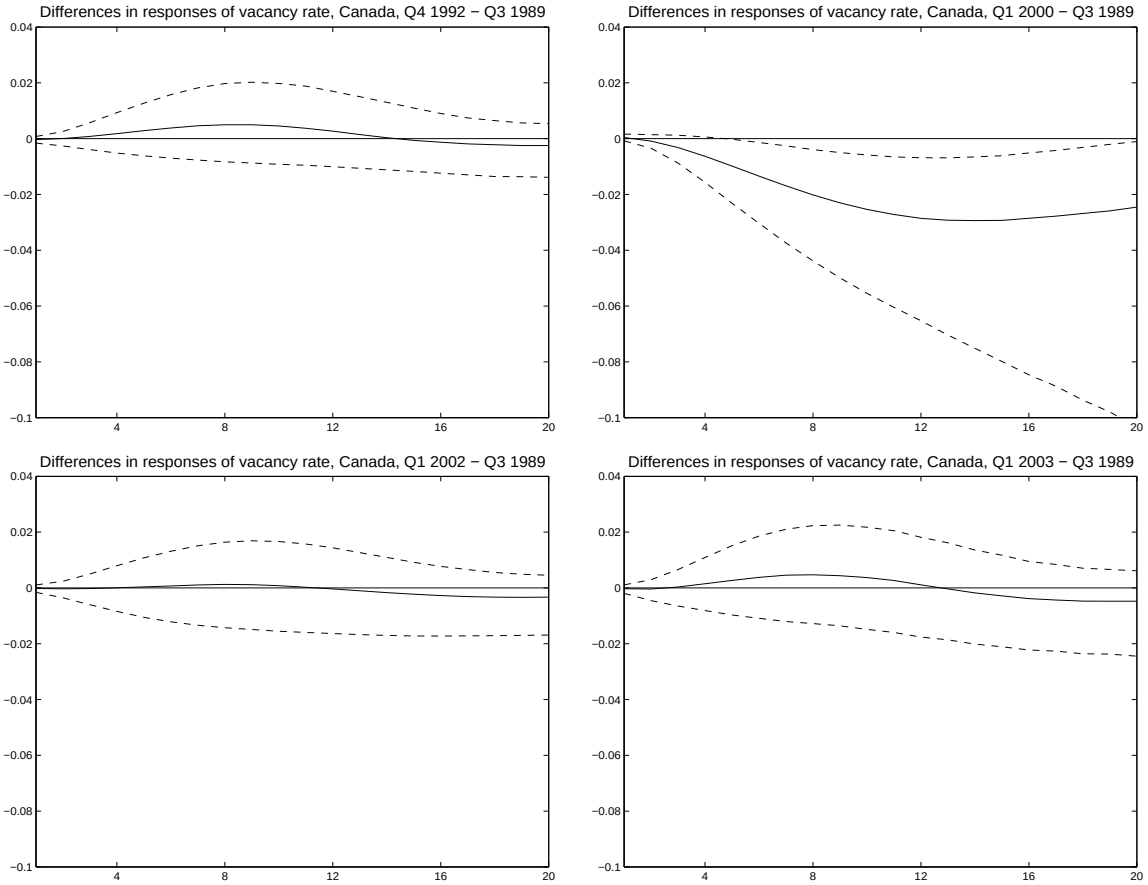


Figure A. 26. Differences in impulse responses of vacancies -*Homo TVP-VAR*, Canada

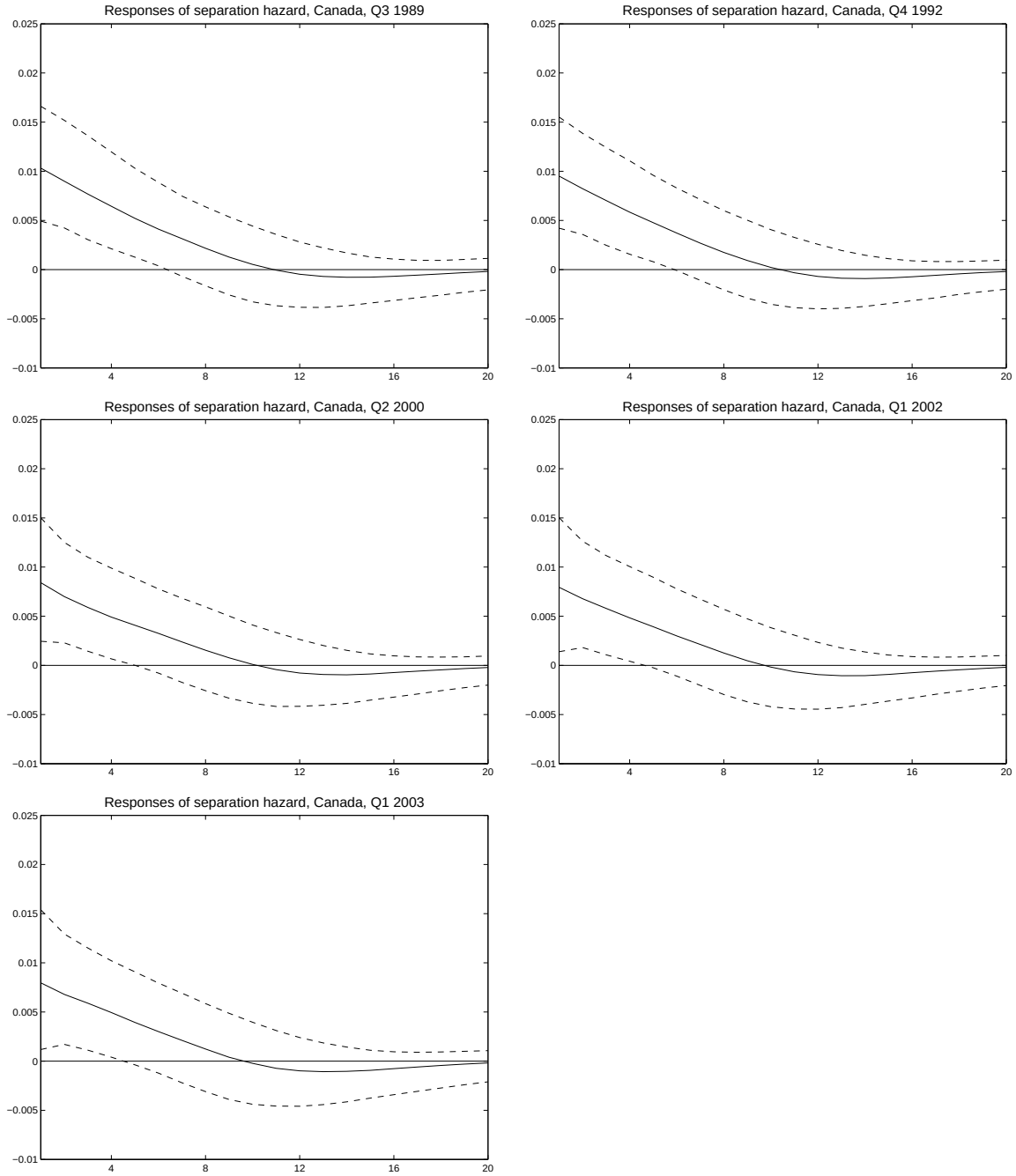


Figure A. 27. Impulse responses of separation hazards -*Hete TVP-VAR*, Canada

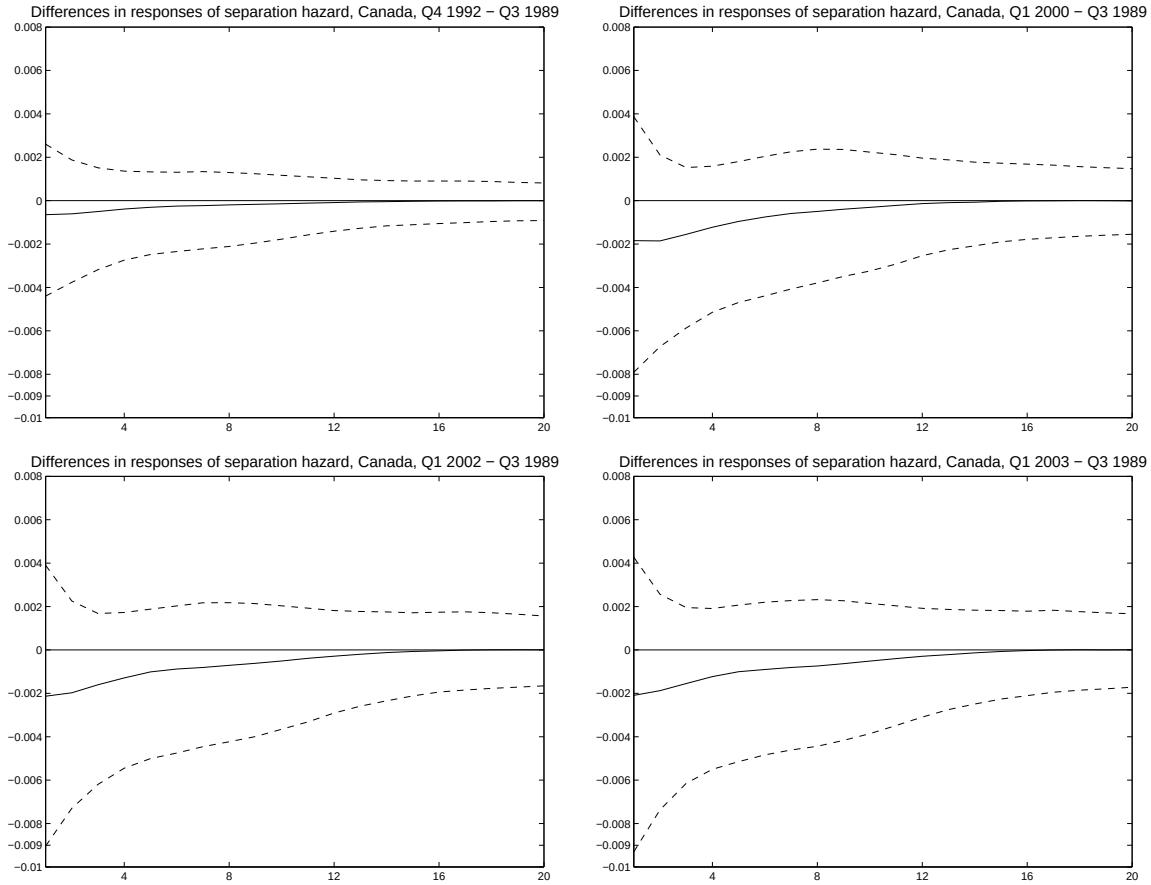


Figure A. 28. Differences in impulse responses of separation hazards -*Hete TVP-VAR*, Canada

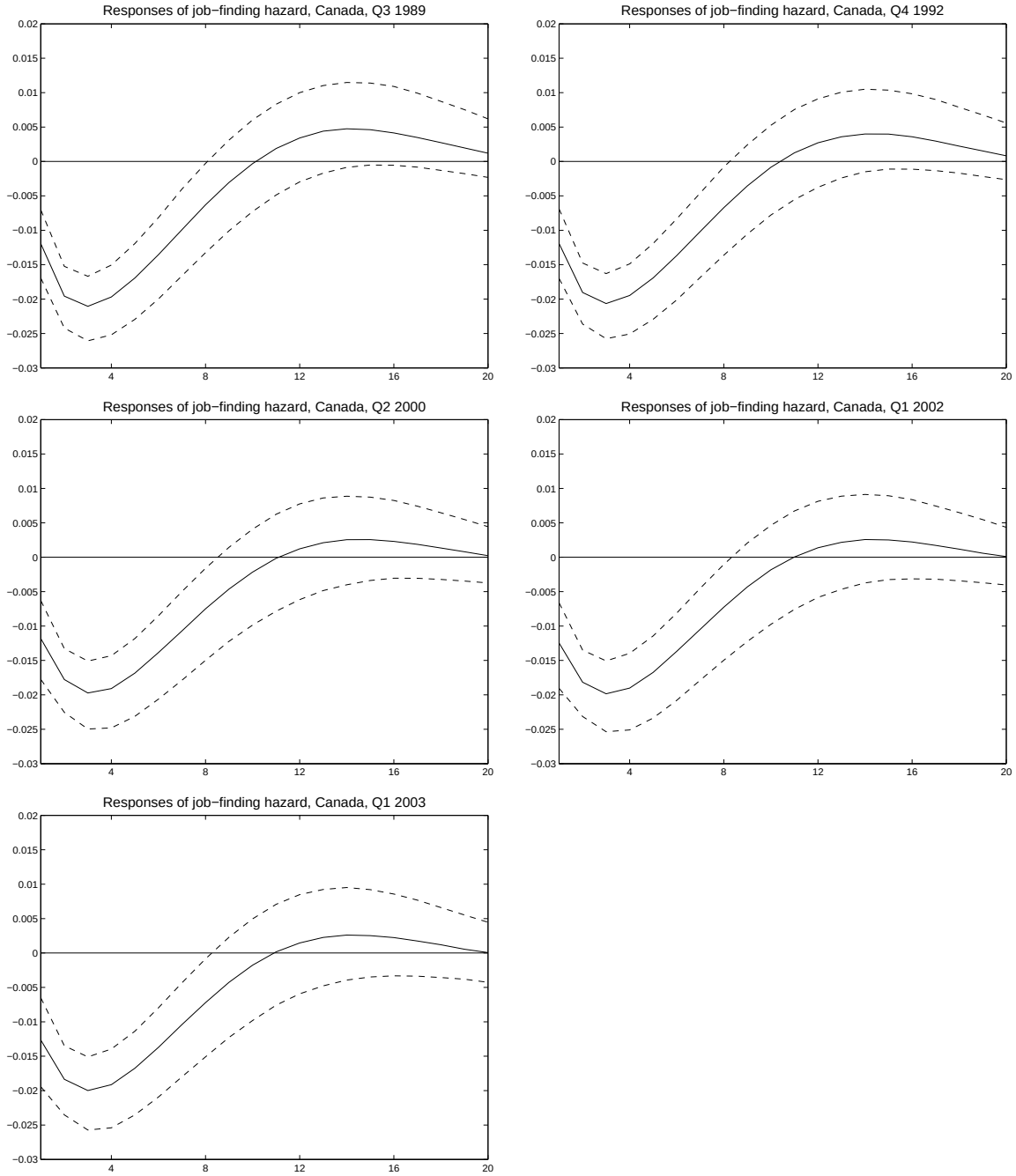


Figure A. 29. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Canada

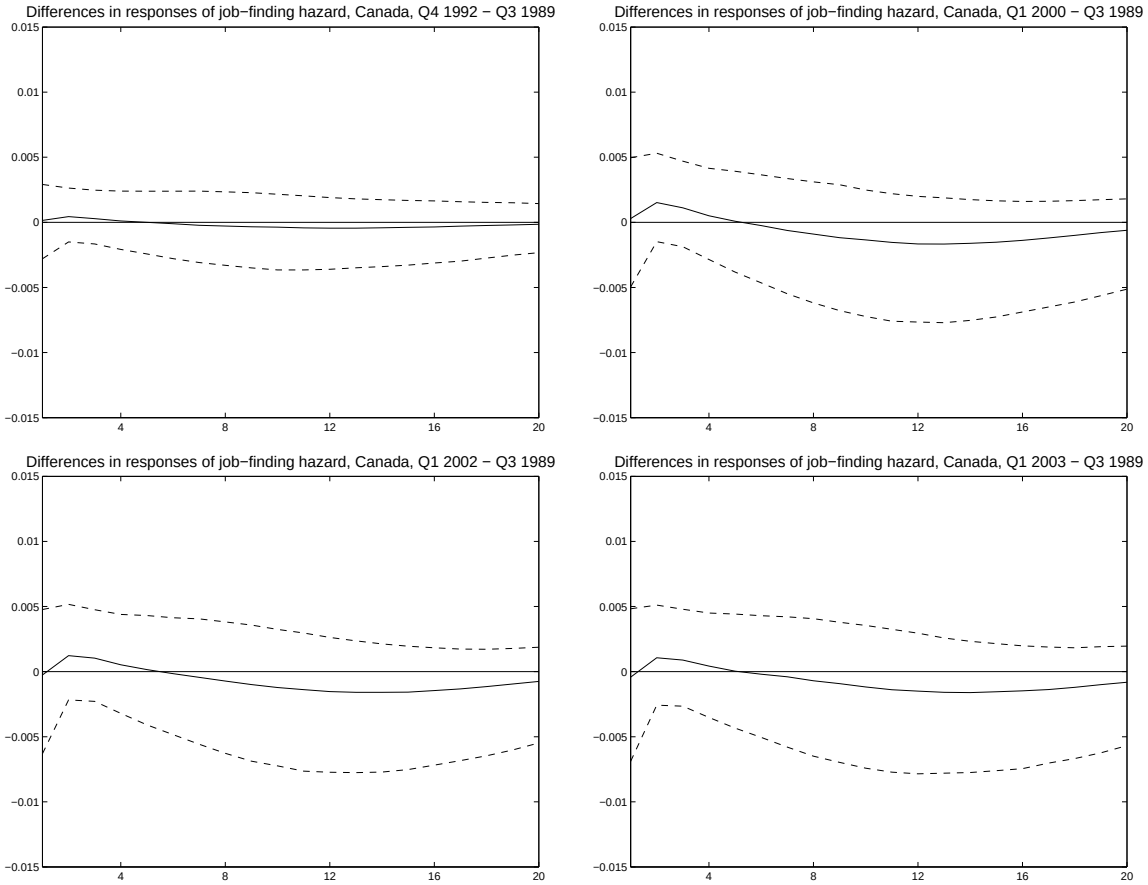


Figure A. 30. Differences in impulse responses of job-finding hazards -*Hete TVP-VAR*, Canada

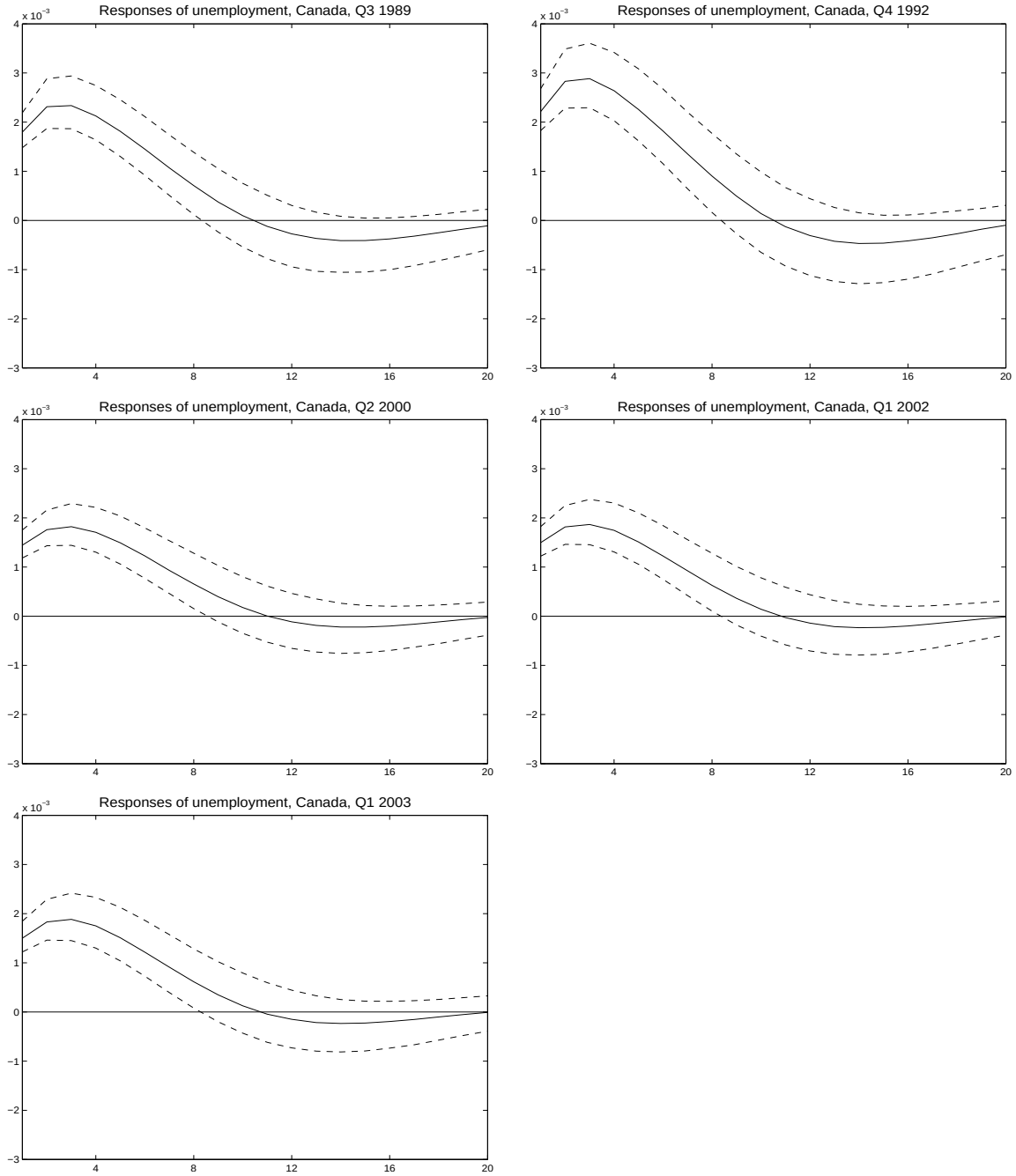


Figure A. 31. Impulse responses of unemployment rates -*Hete TVP-VAR*, Canada

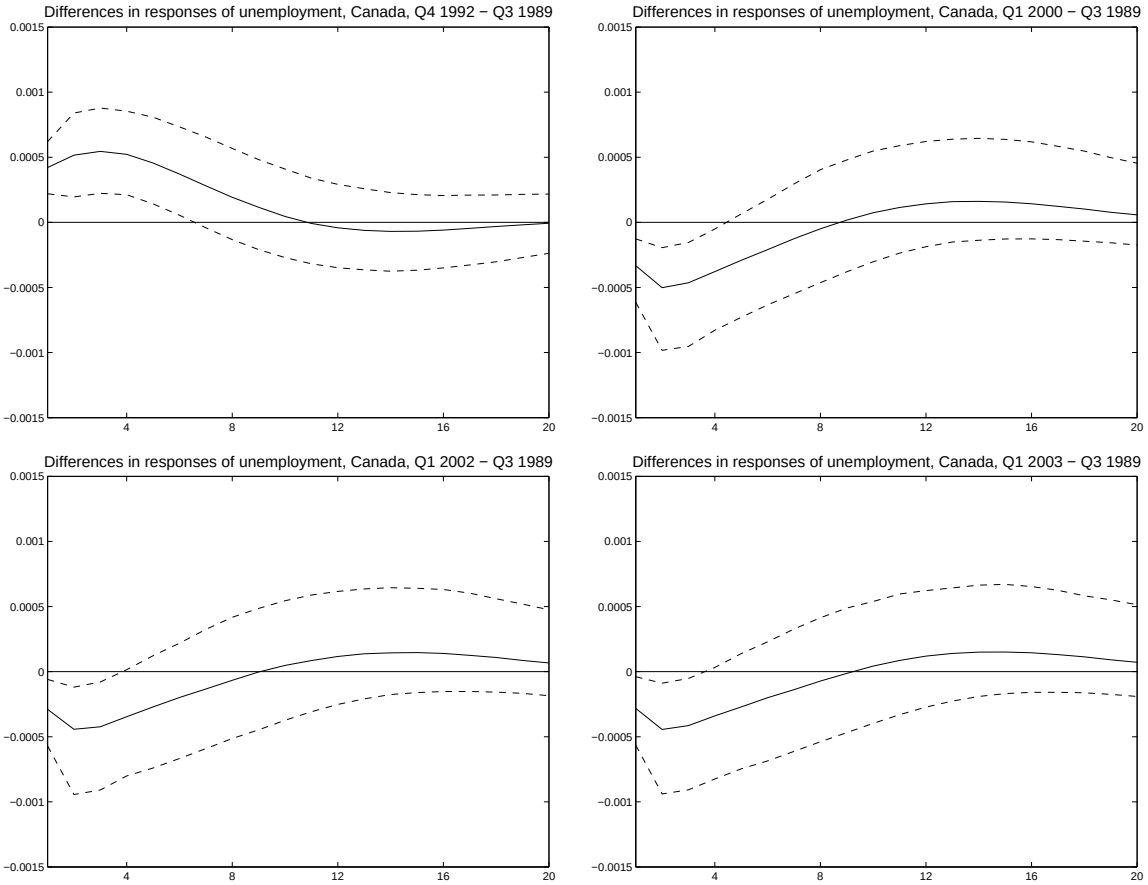


Figure A. 32. Differences in impulse responses of unemployment rates -*Hete TVP-VAR*, Canada

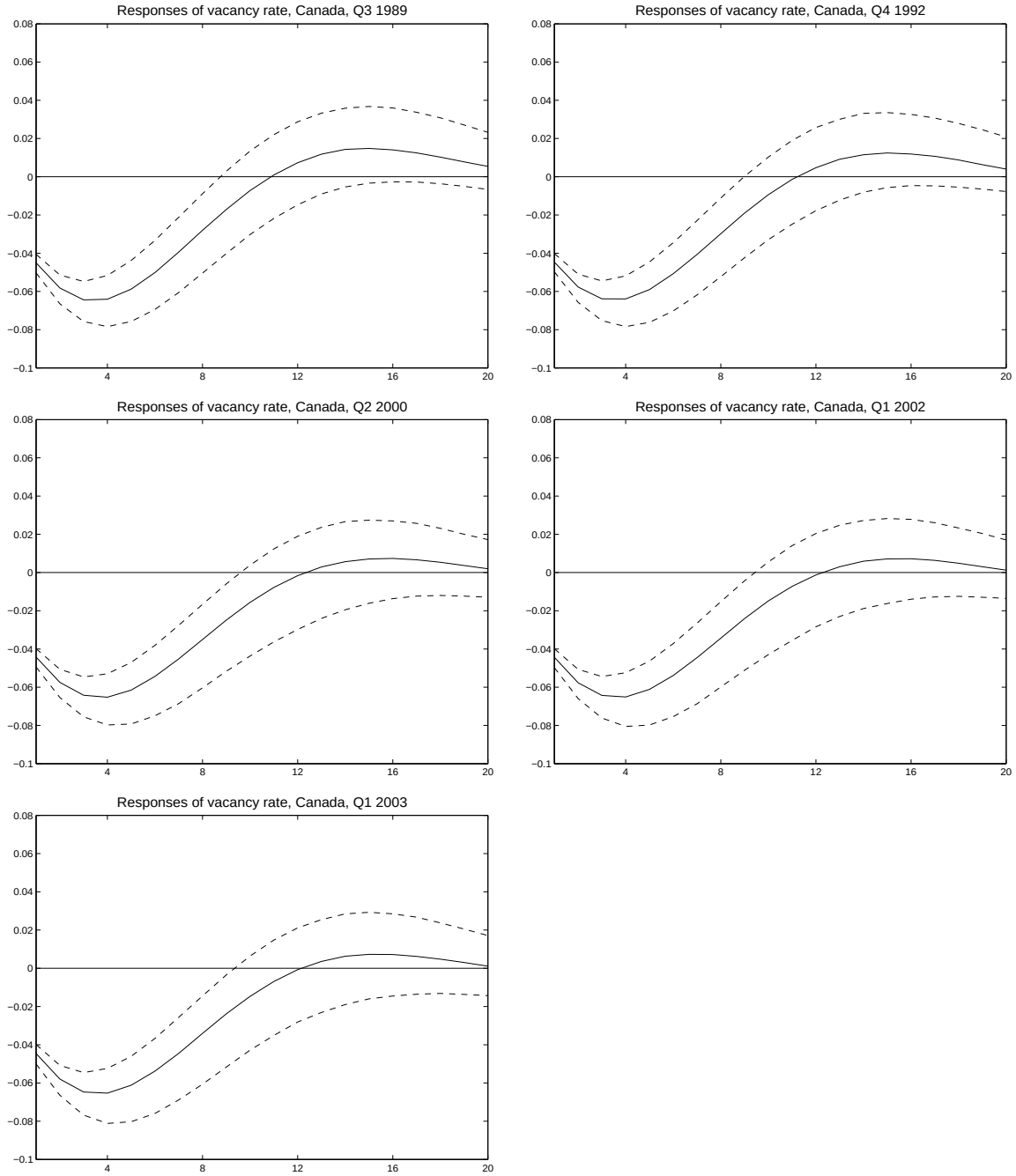


Figure A. 33. Impulse responses of vacancies -*Hete TVP-VAR*, Canada

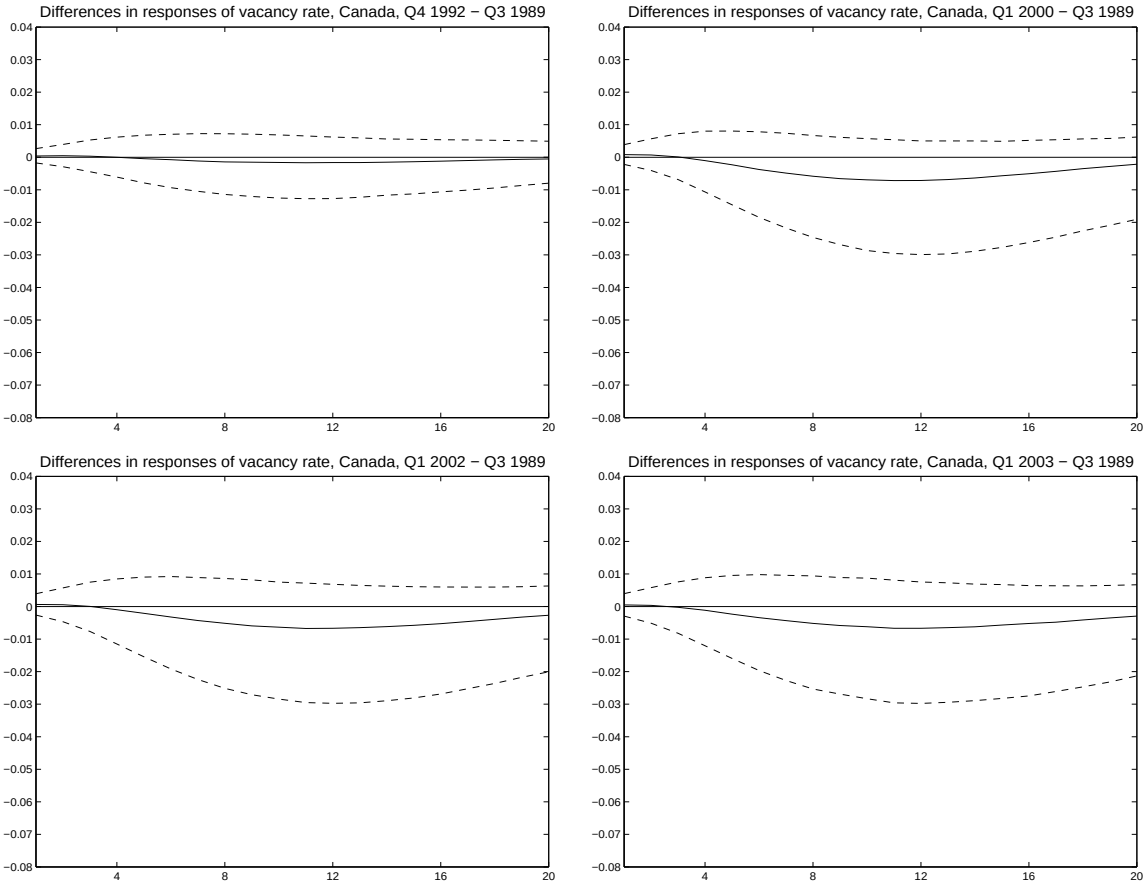


Figure A. 34. Differences in impulse responses of vacancies -*Hete TVP-VAR*, Canada

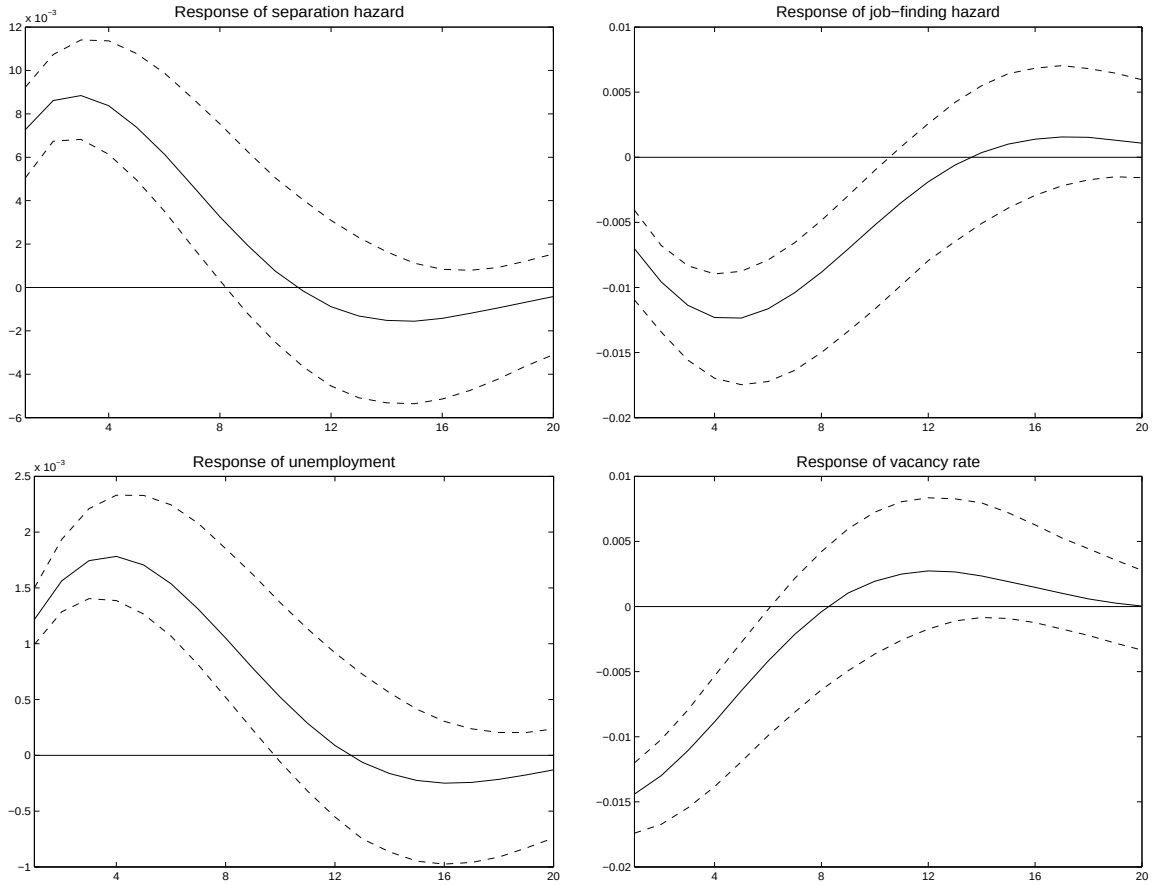


Figure A. 35. Impulse responses - VAR, France

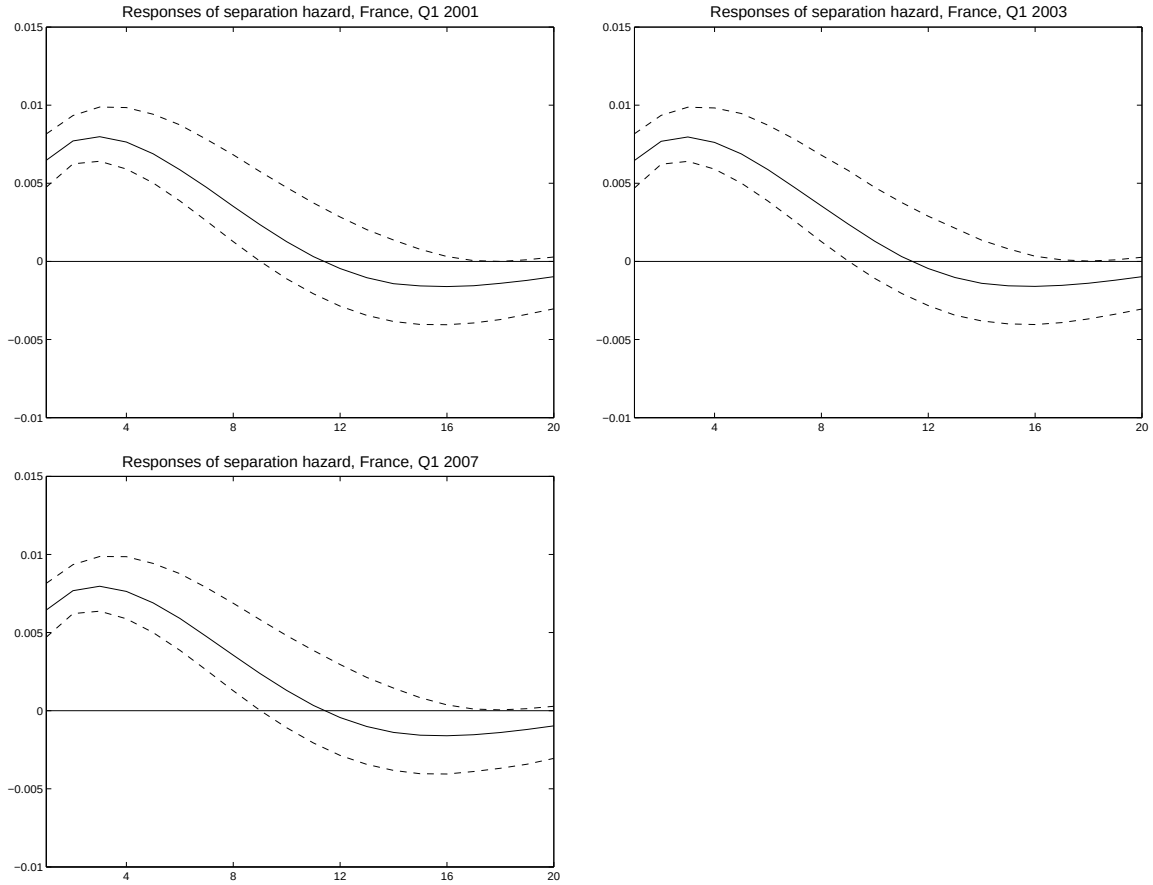


Figure A. 36. Impulse responses of separation hazards -*Homo TVP-VAR*, France

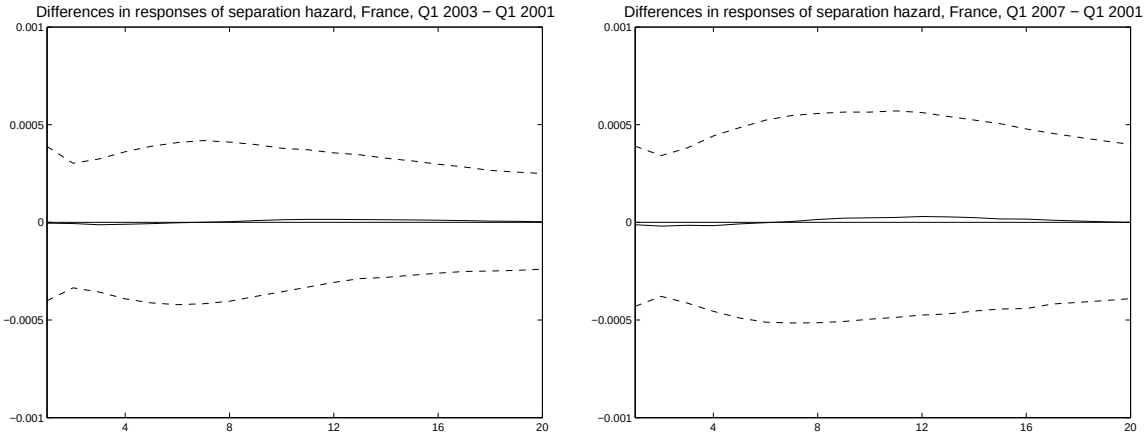


Figure A. 37. Differences in impulse responses of separation hazards -*Homo TVP-VAR*, France

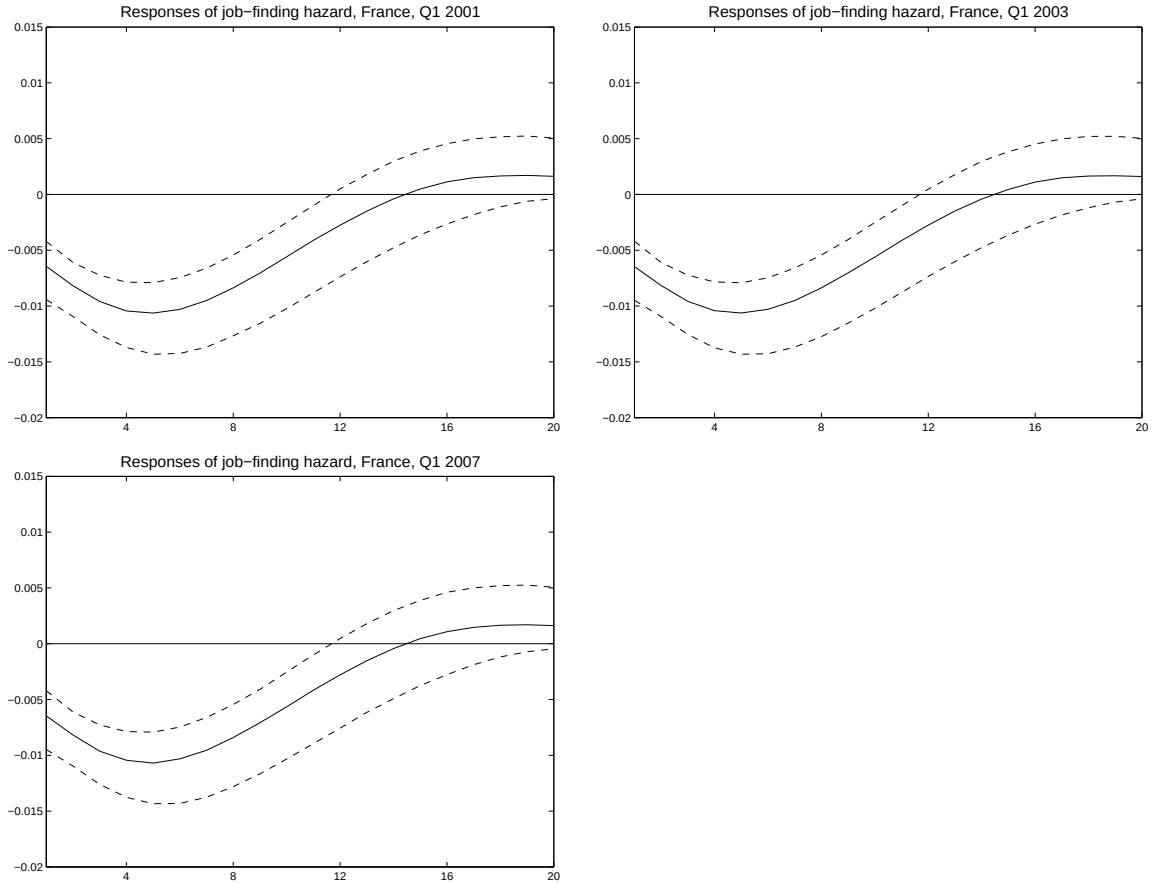


Figure A. 38. Impulse responses of job-finding hazards -*Homo TVP-VAR*, France

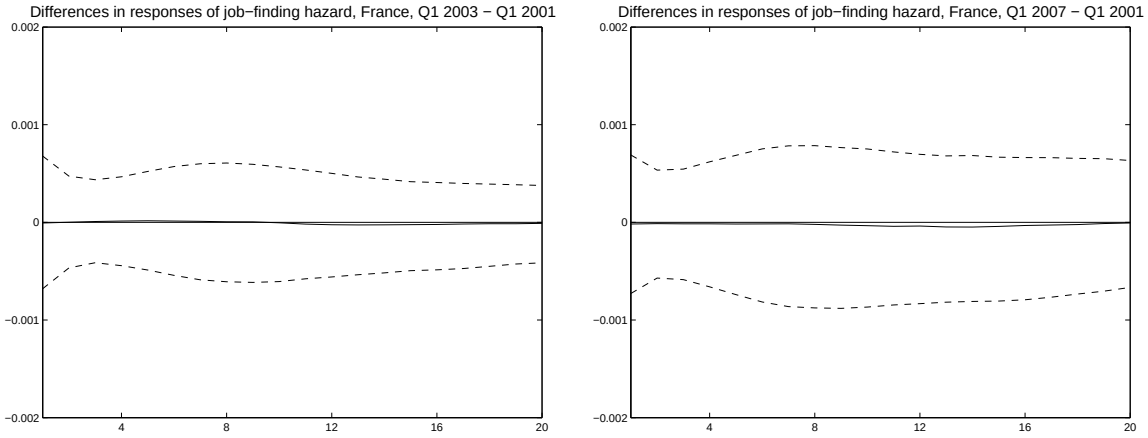


Figure A. 39. Differences in impulse responses of job-finding hazards -*Homo TVP-VAR*, France

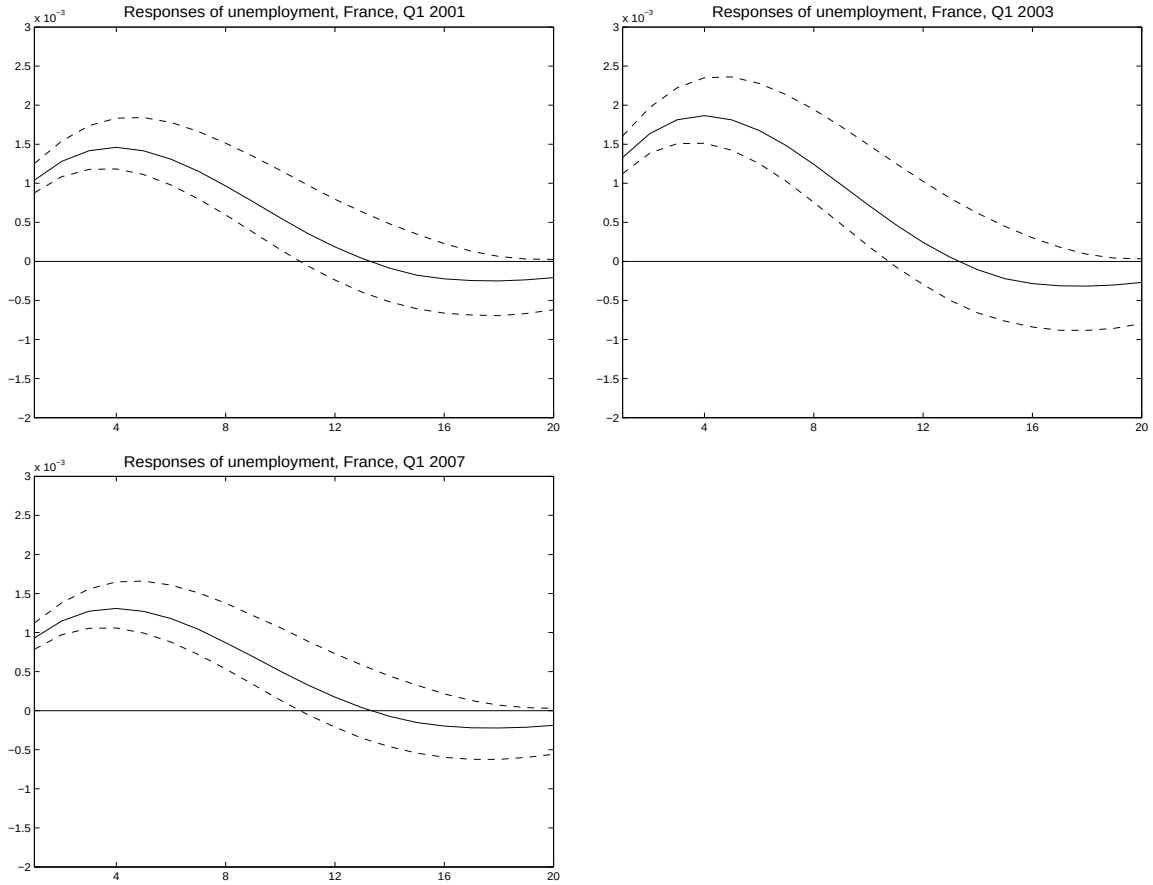


Figure A. 40. Impulse responses of unemployment rates -*Homo TVP-VAR*, France

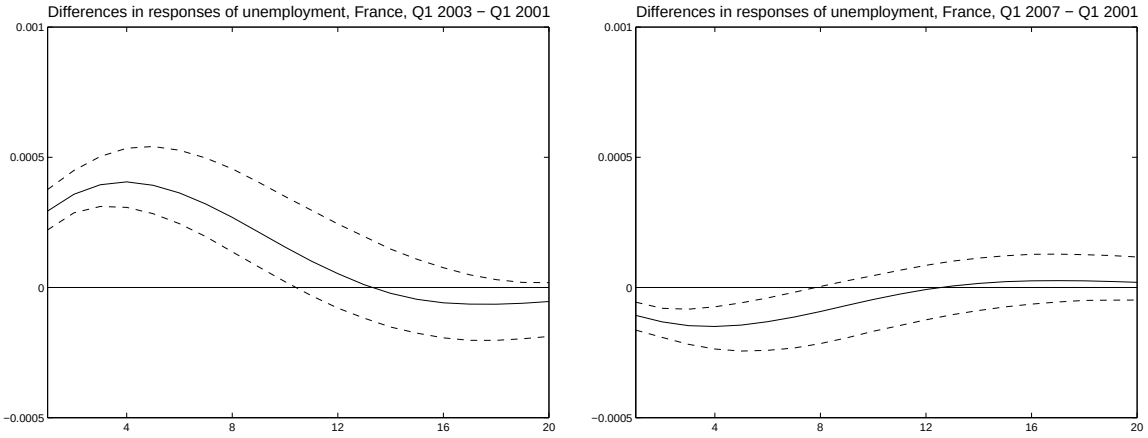


Figure A. 41. Differences in impulse responses of unemployment rates -*Homo TVP-VAR*, France

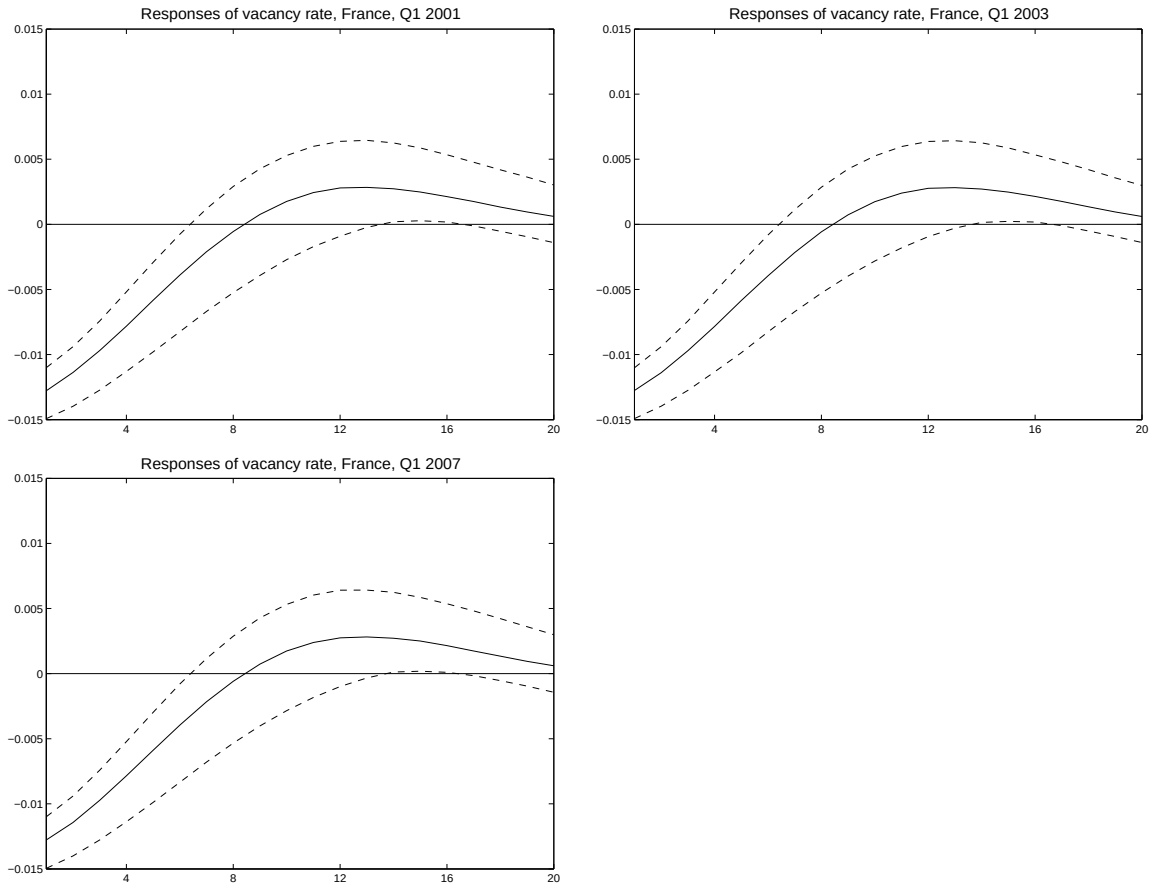


Figure A. 42. Impulse responses of vacancies -*Homo TVP-VAR*, France

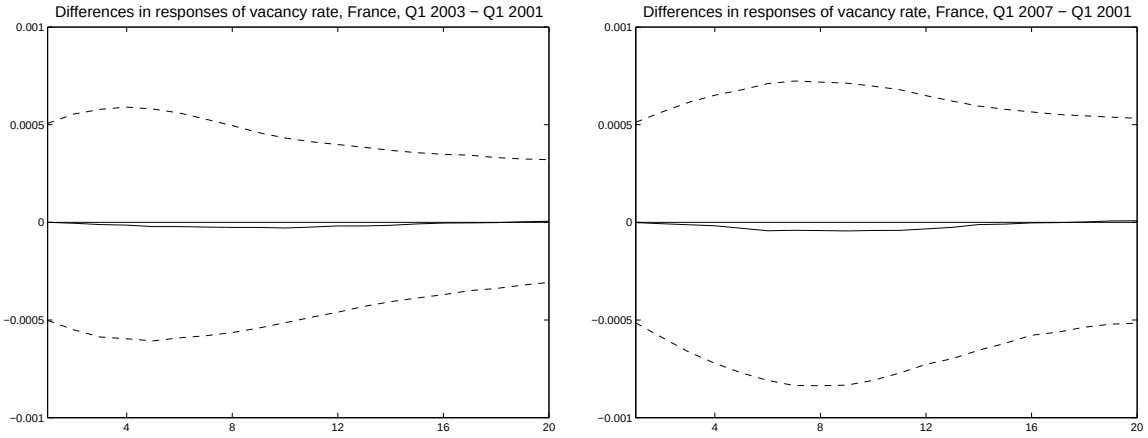


Figure A. 43. Differences in impulse responses of vacancies -*Homo TVP-VAR*, France

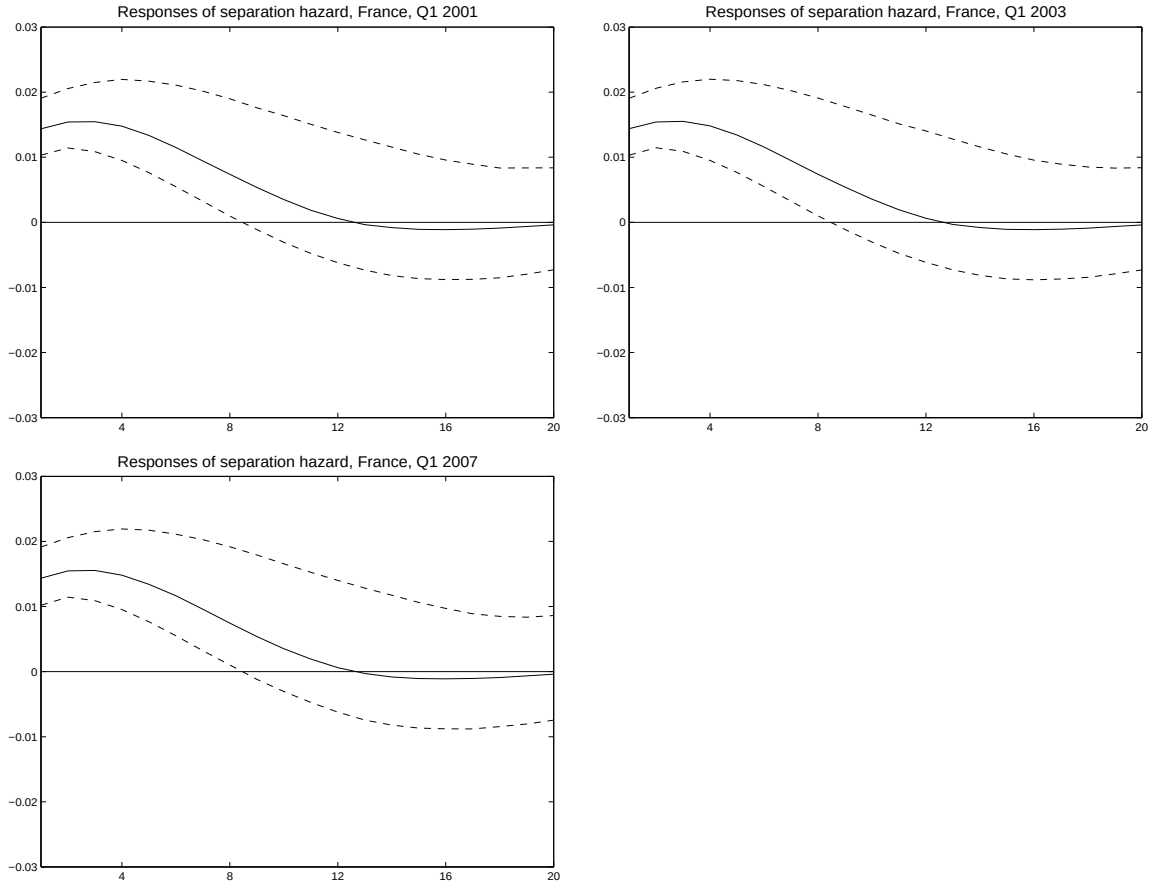


Figure A. 44. Impulse responses of separation hazards -*Hete TVP-VAR*, France

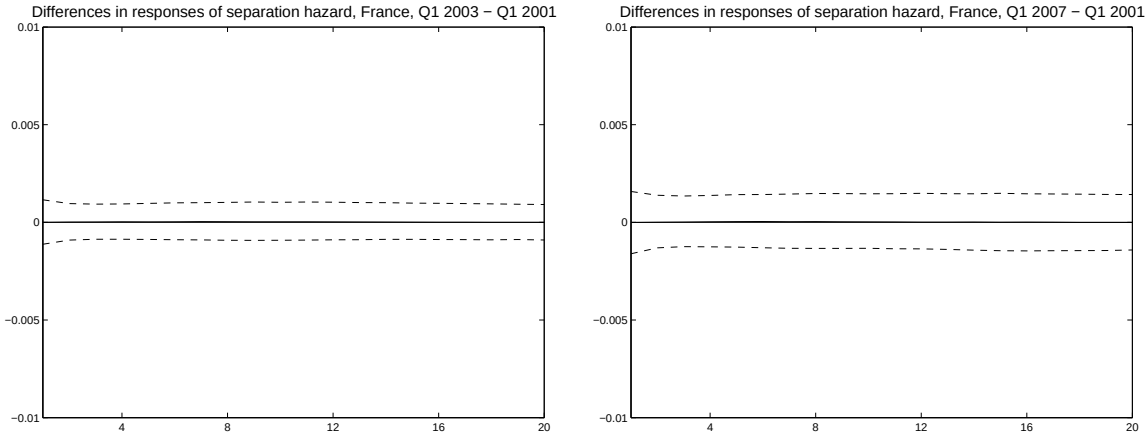


Figure A. 45. Differences in impulse responses of separation hazards -*Hete TVP-VAR*, France

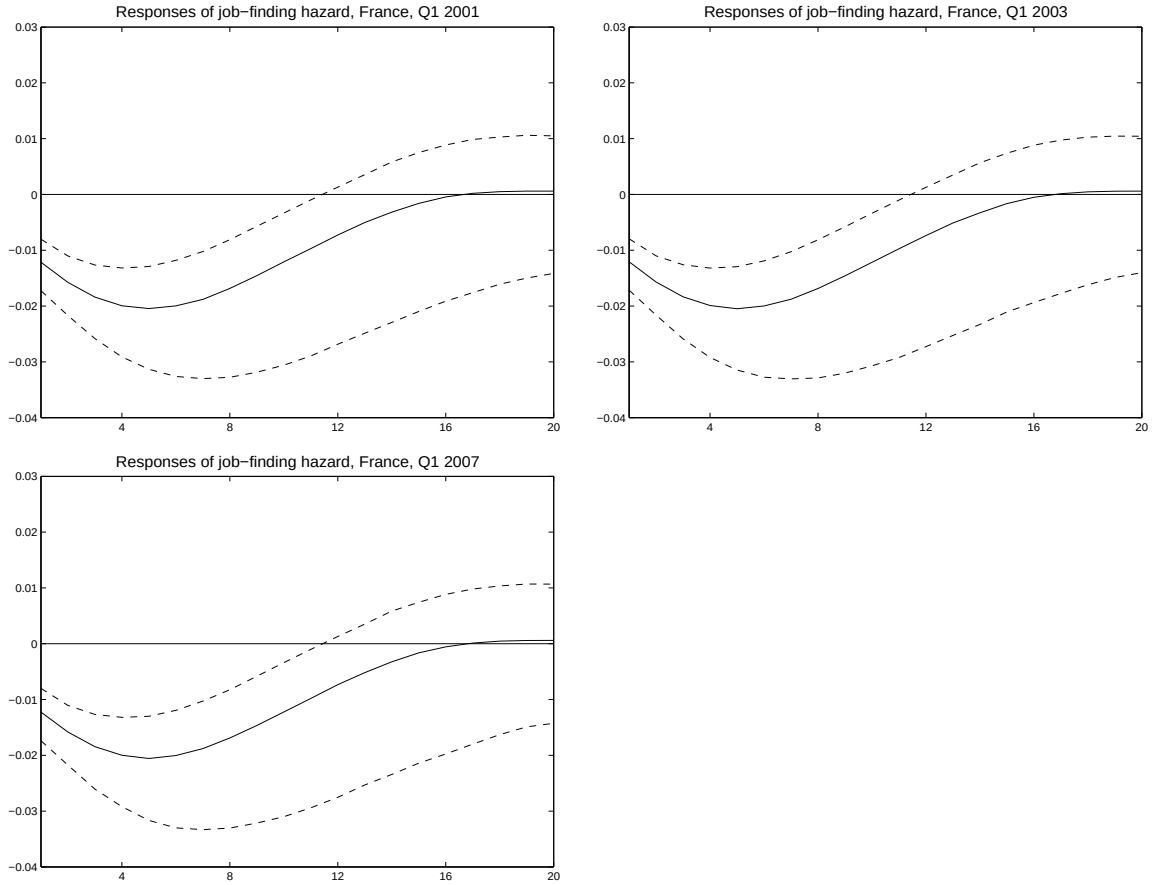


Figure A. 46. Impulse responses of job-finding hazards -*Hete TVP-VAR*, France

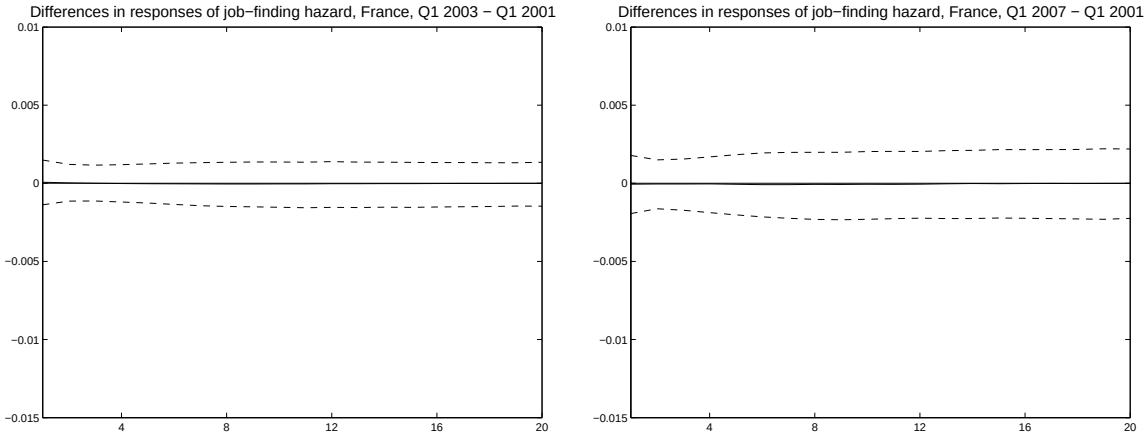


Figure A. 47. Differences in impulse responses of job-finding hazards -*Hete TVP-VAR*, France

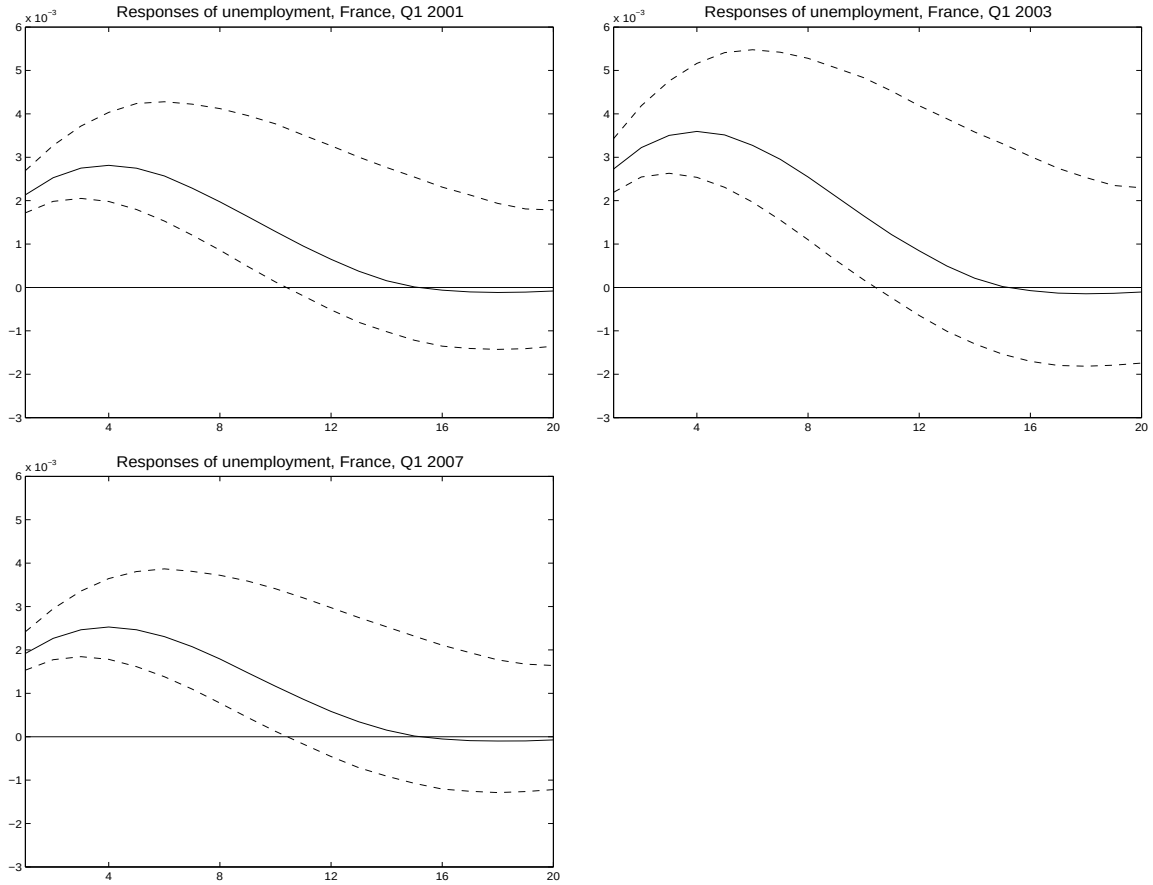


Figure A. 48. Impulse responses of unemployment rates -*Hete TVP-VAR*, France

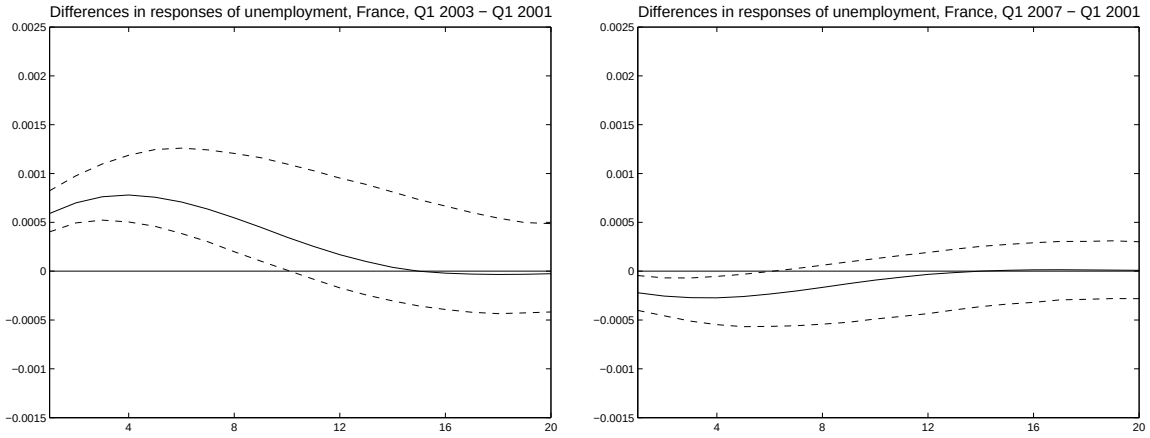


Figure A. 49. Differences in impulse responses of unemployment rates -*Hete TVP-VAR*, France

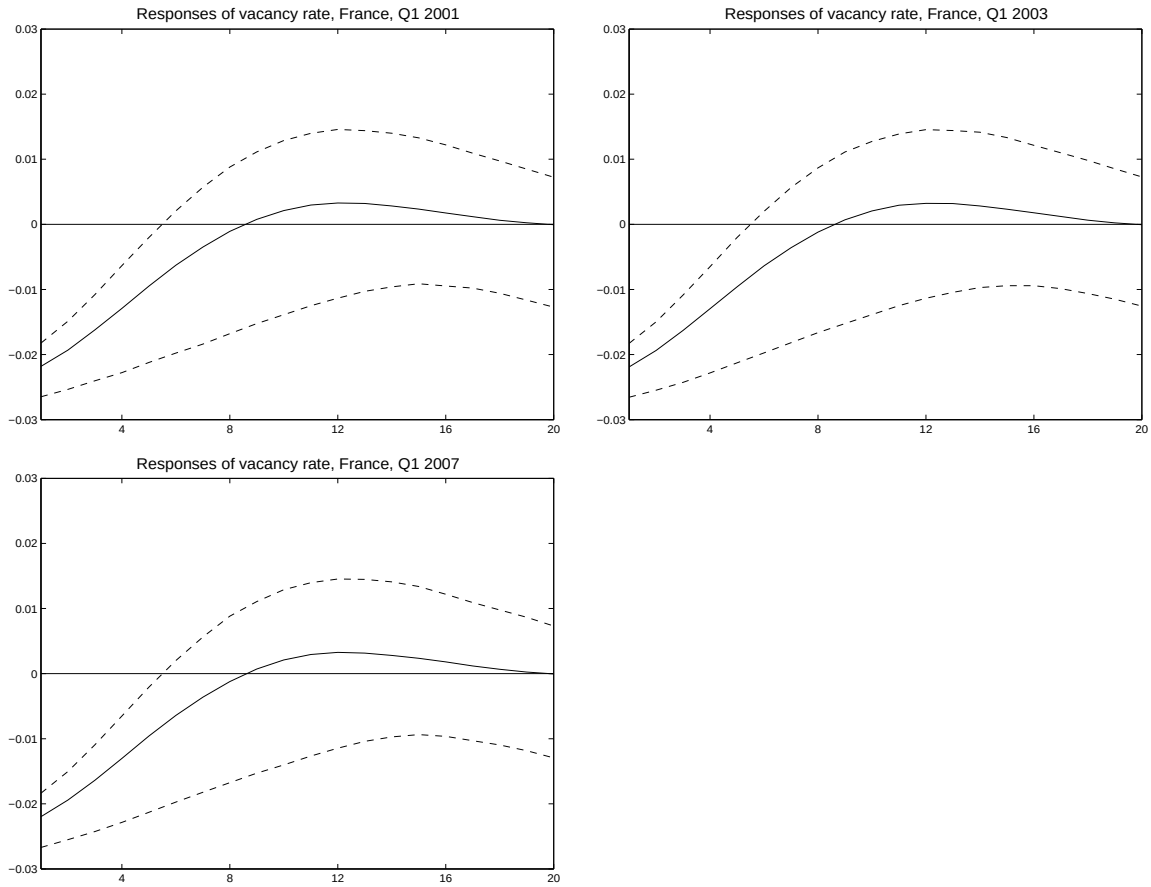


Figure A. 50. Impulse responses of vacancies -*Hete TVP-VAR*, France

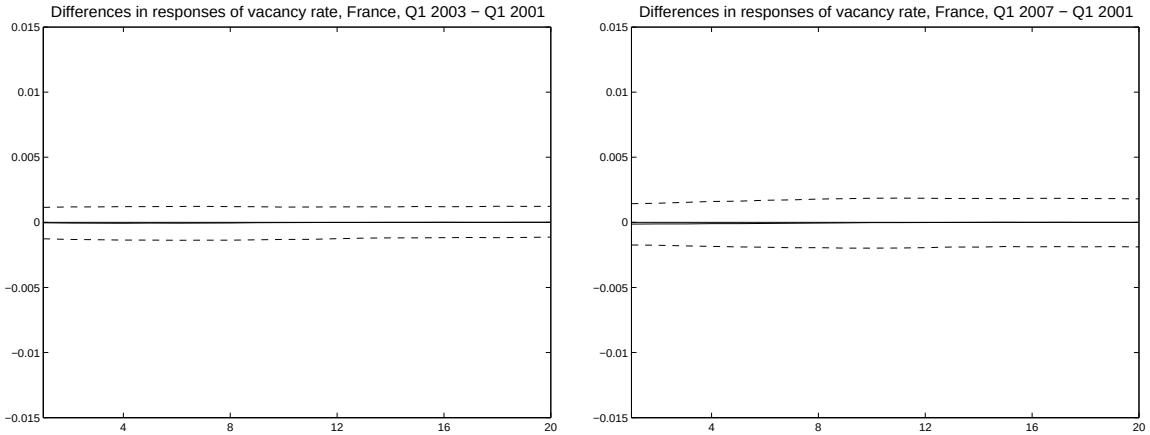


Figure A. 51. Differences in impulse responses of vacancies -*Hete TVP-VAR*, France

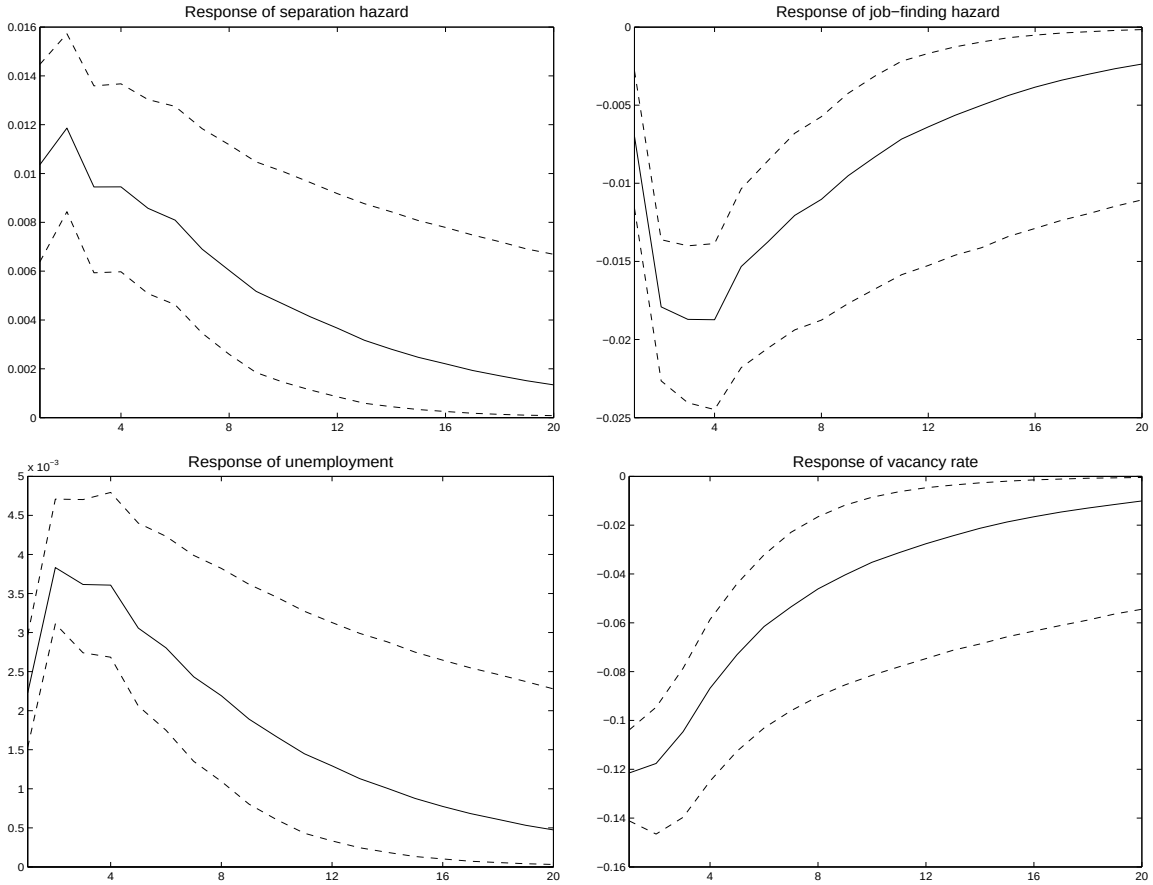


Figure A. 52. Impulse responses - VAR, Spain

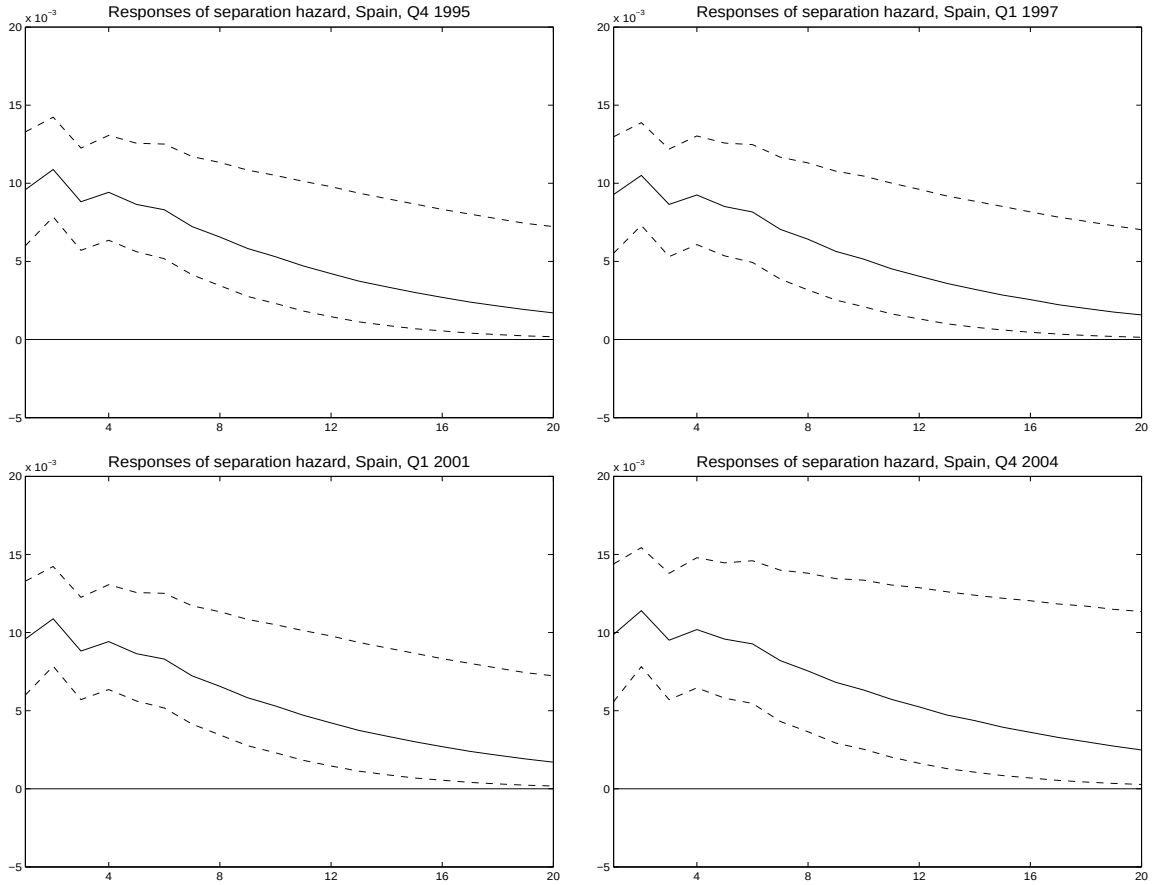


Figure A. 53. Impulse responses of separation hazards -*Homo TVP-VAR*, Spain

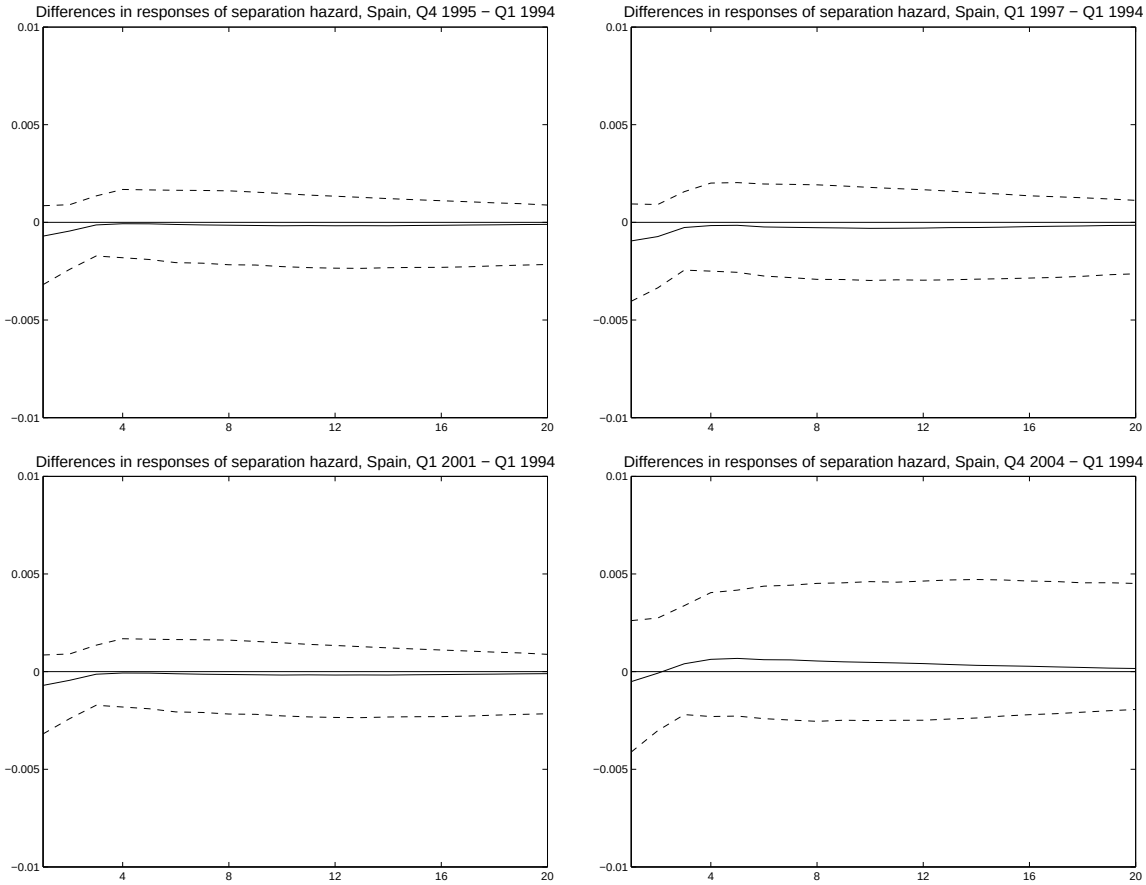


Figure A. 54. Differences in impulse responses of separation hazards -*Homo TVP-VAR*, Spain

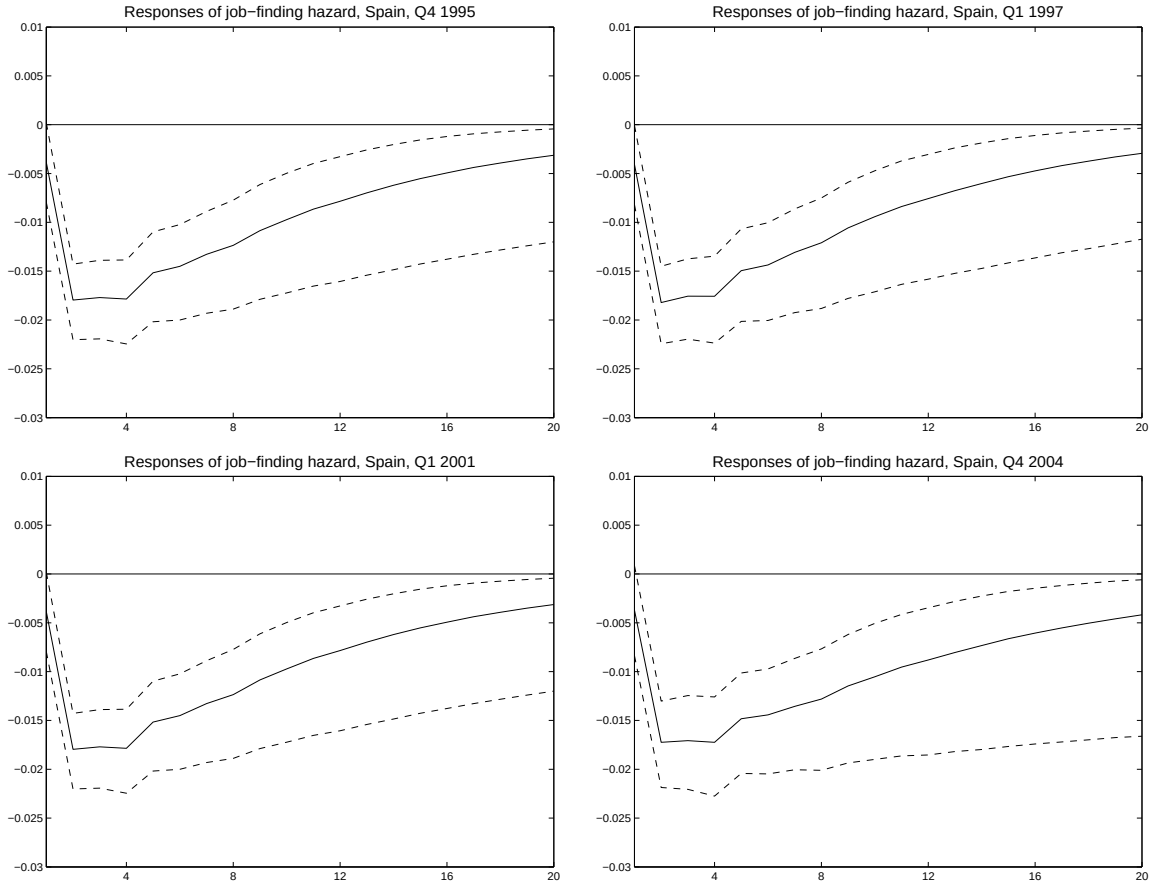


Figure A. 55. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

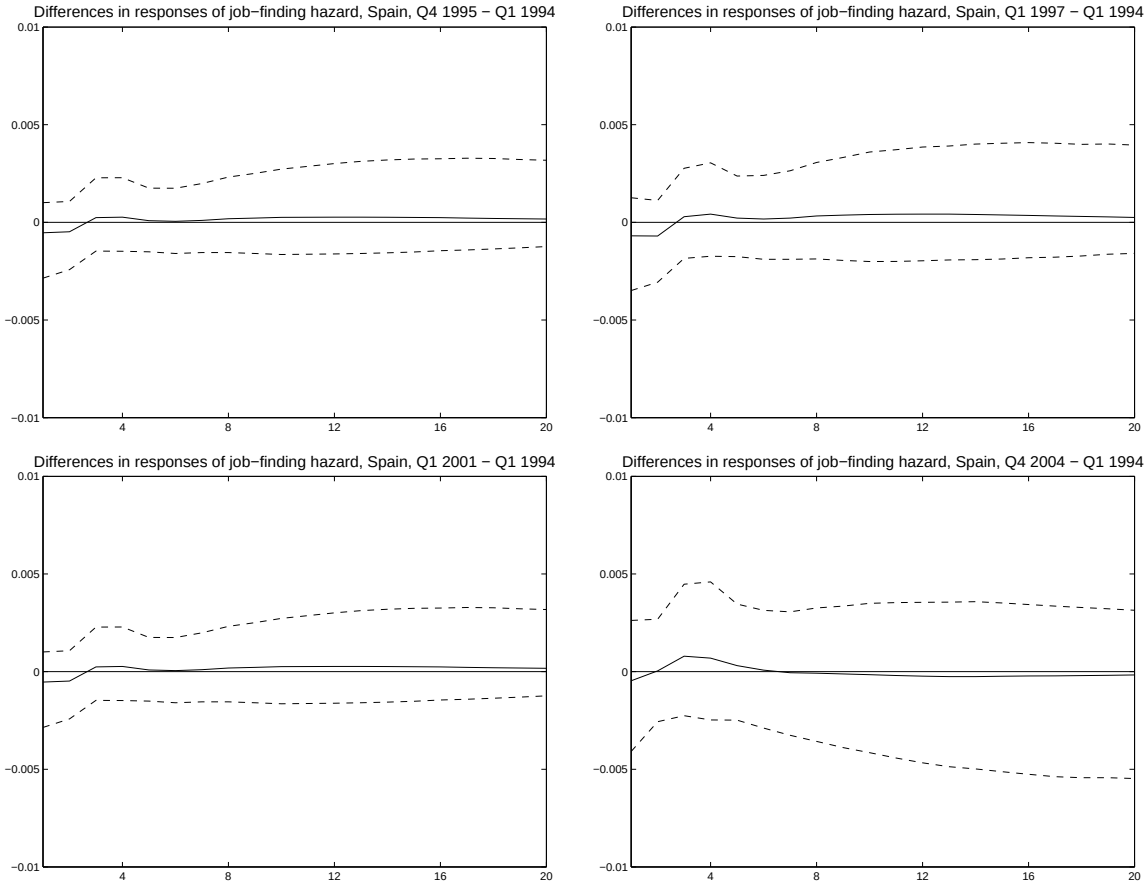


Figure A. 56. Differences in impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

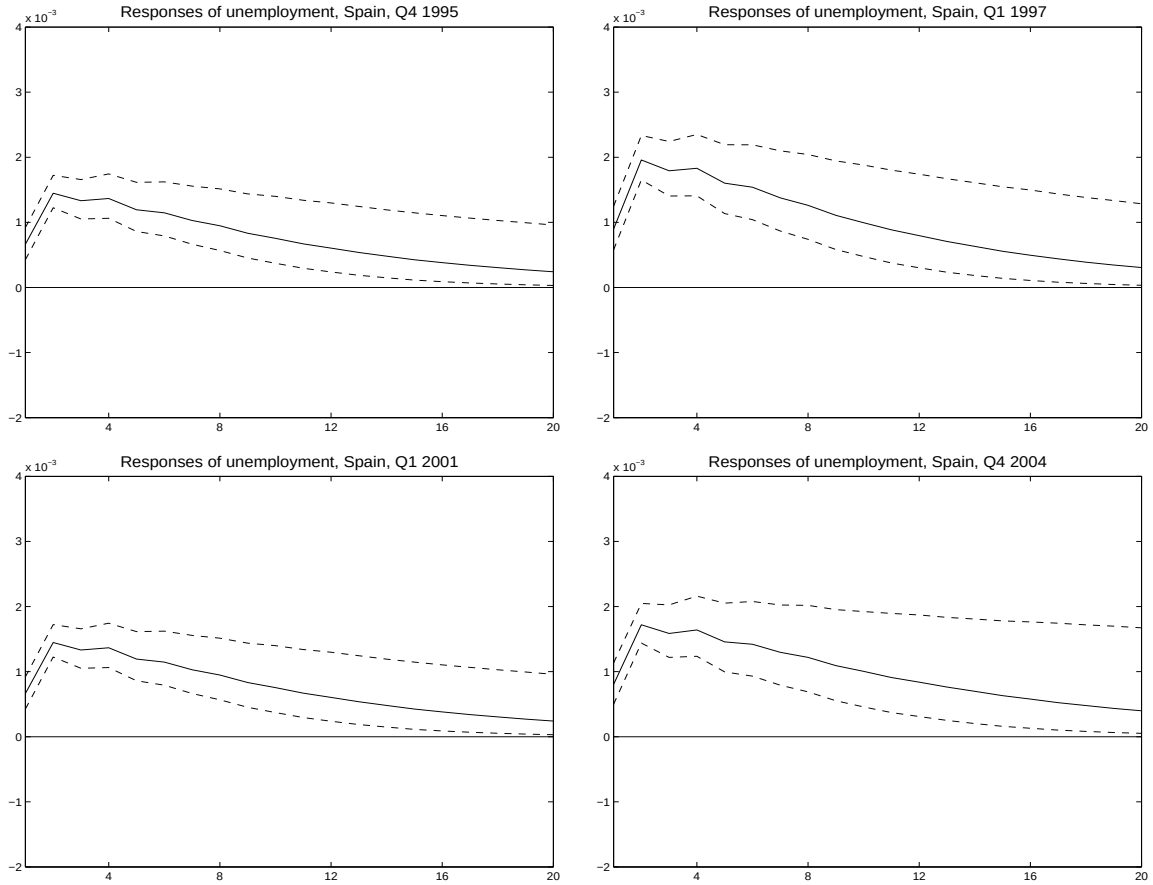


Figure A. 57. Impulse responses of unemployment rates -*Homo TVP-VAR*, Spain

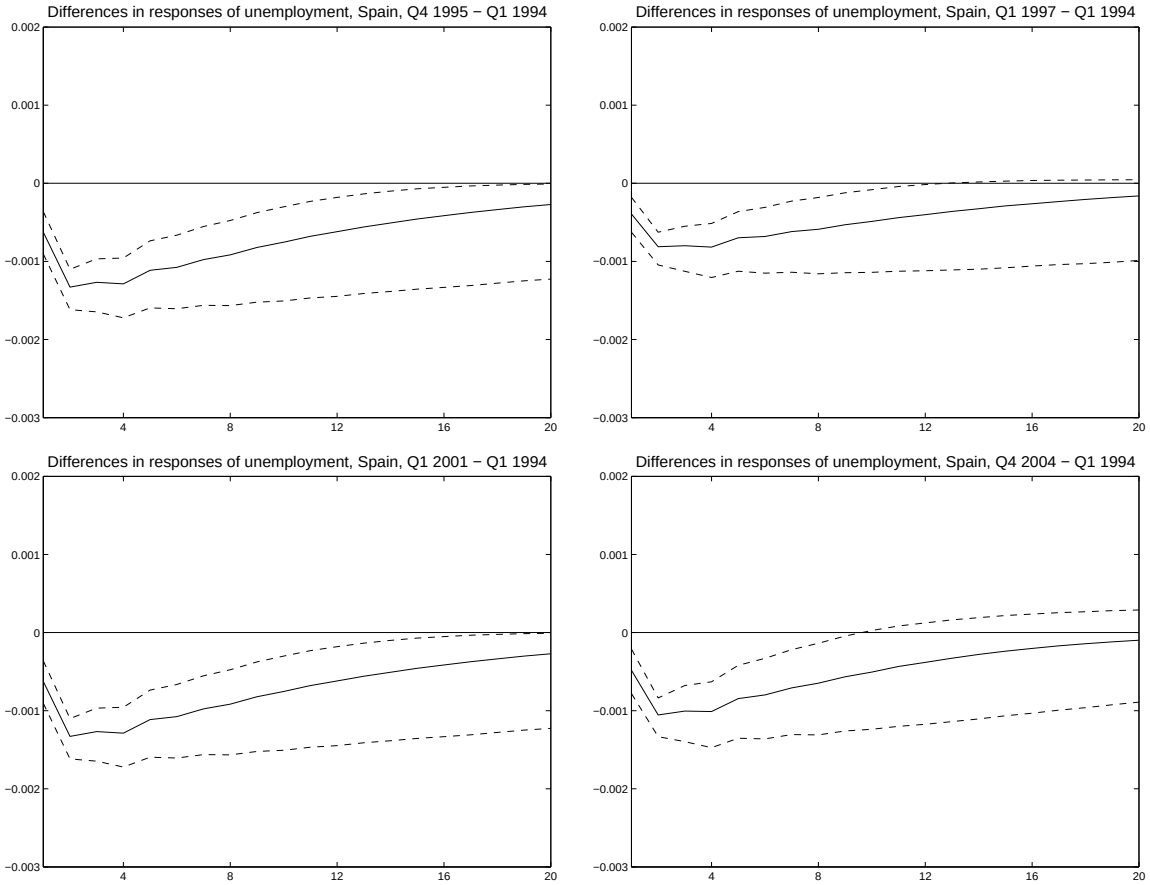


Figure A. 58. Differences in impulse responses of unemployment rates -*Homo TVP-VAR*, Spain

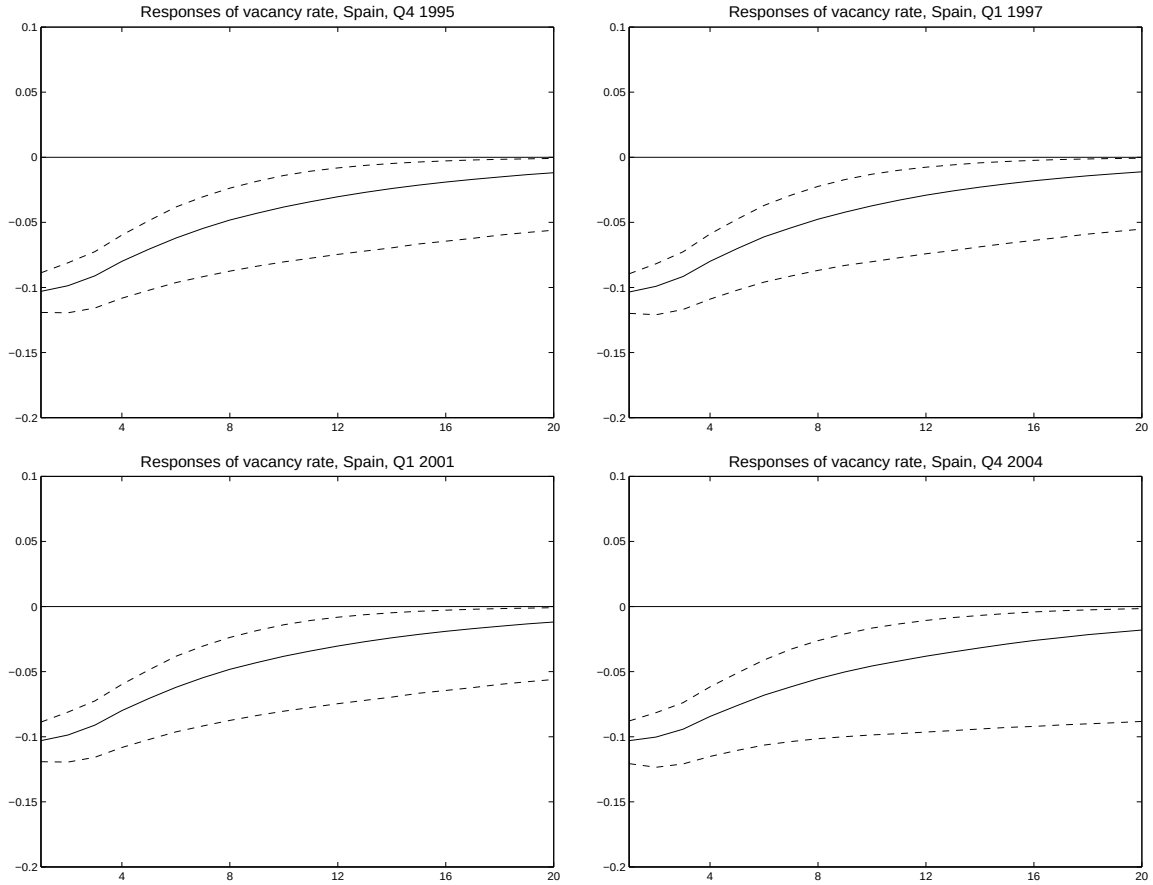


Figure A. 59. Impulse responses of vacancies -*Homo TVP-VAR*, Spain

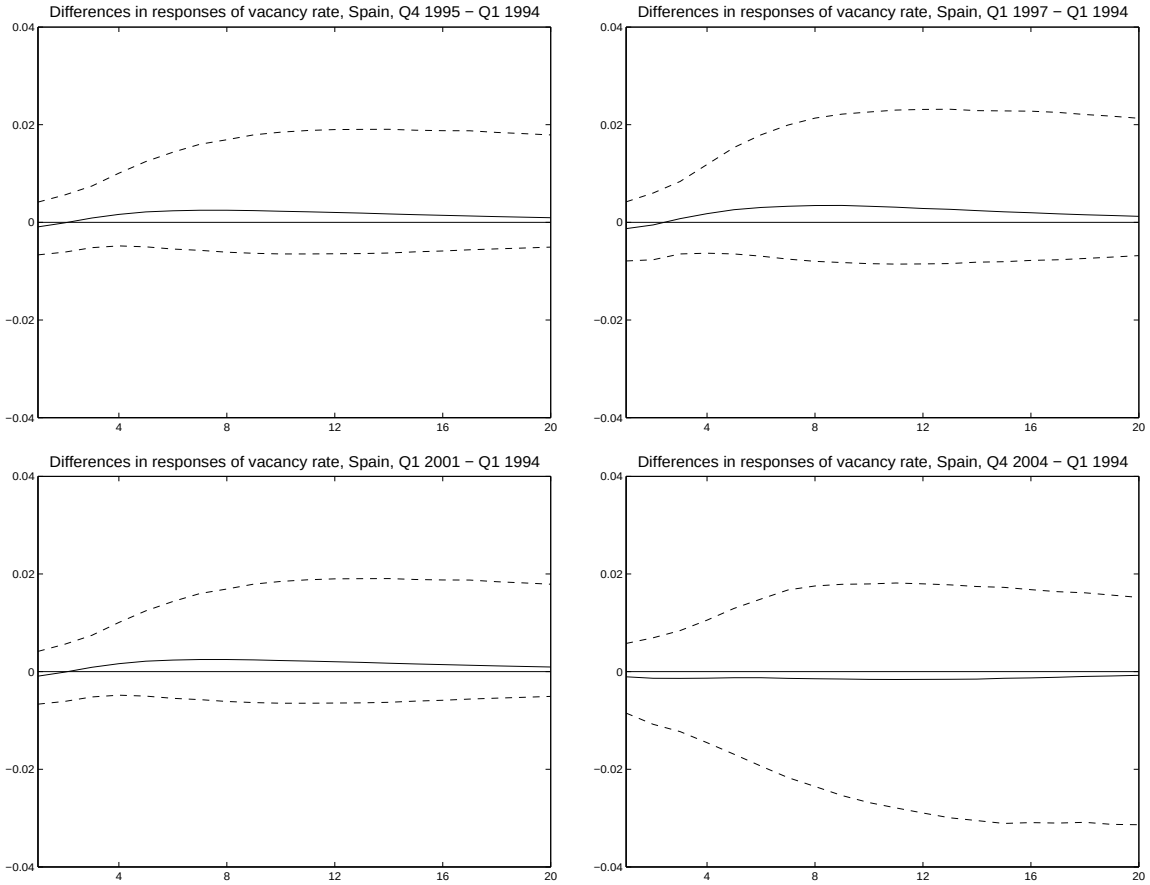


Figure A. 60. Differences in impulse responses of vacancies -*Homo TVP-VAR*, Spain

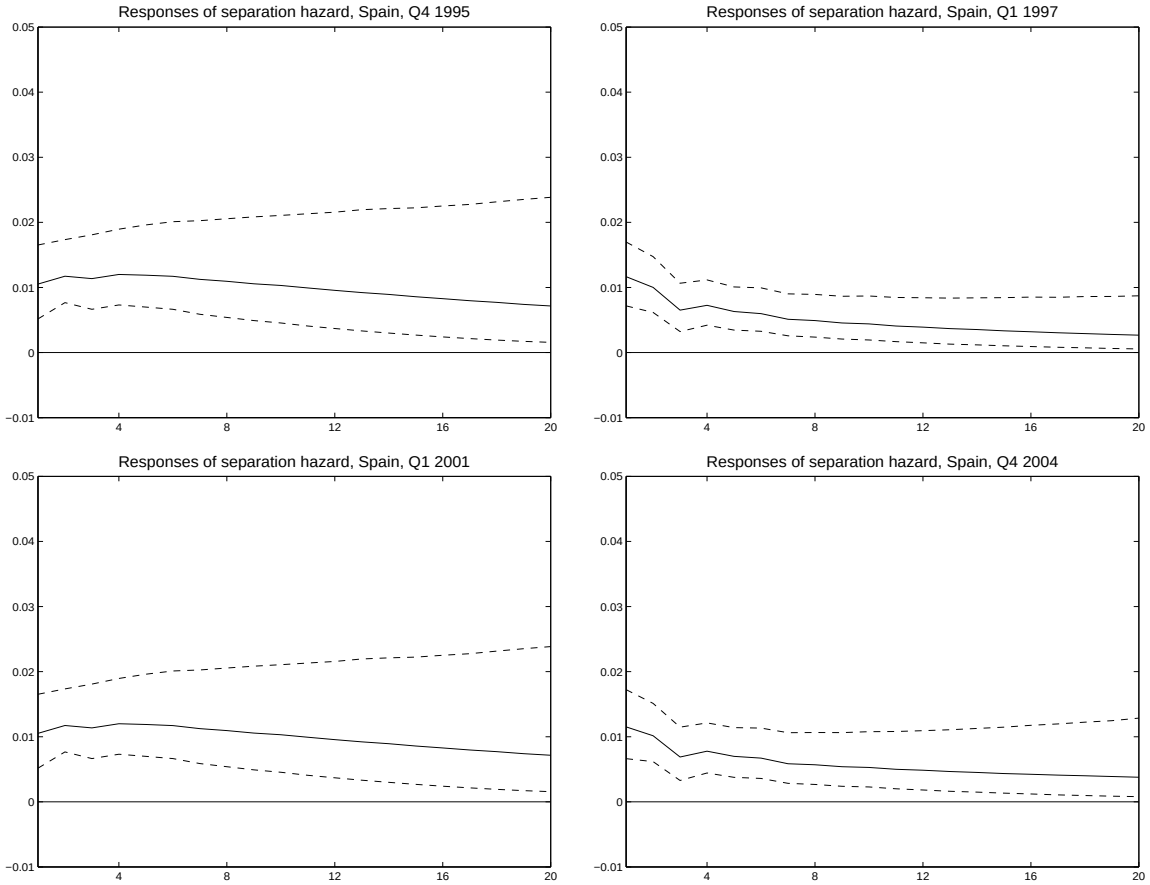


Figure A. 61. Impulse responses of separation hazards -*Hete TVP-VAR*, Spain

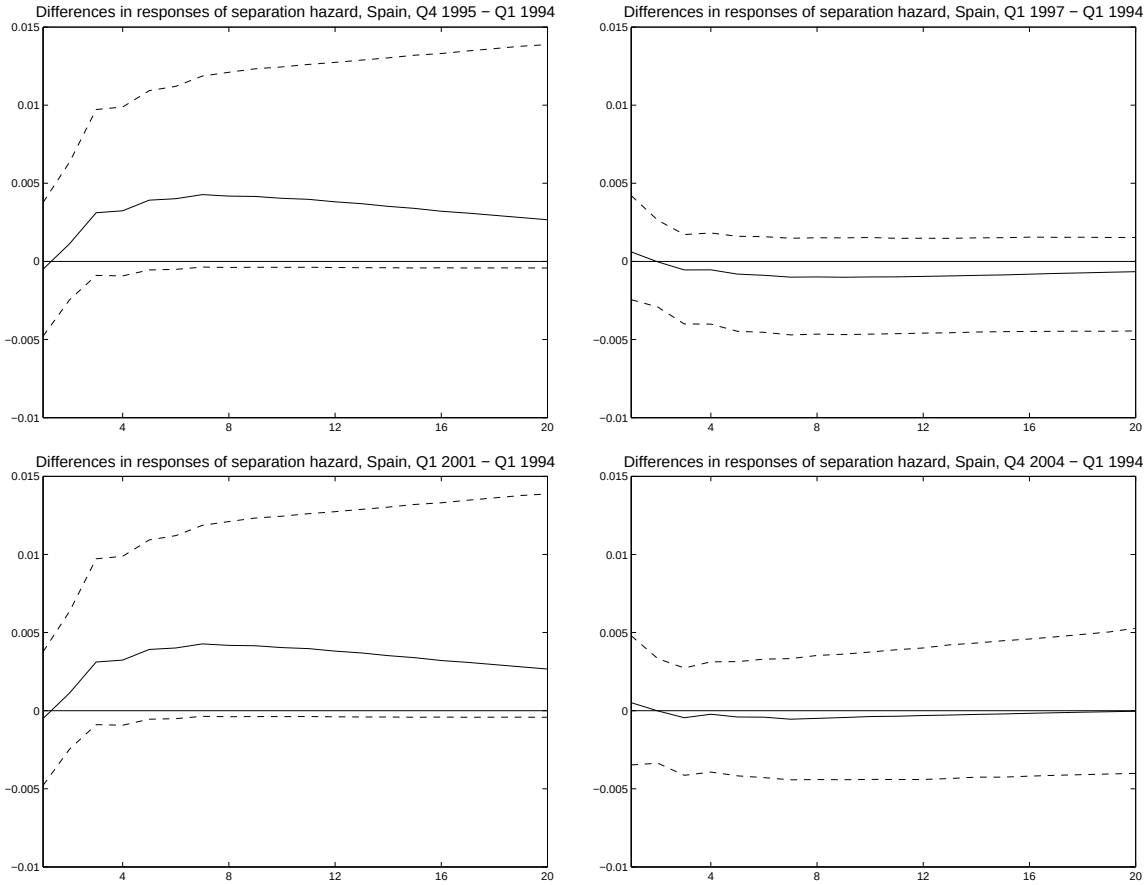


Figure A. 62. Differences in impulse responses of separation hazards -*Hete TVP-VAR*, Spain

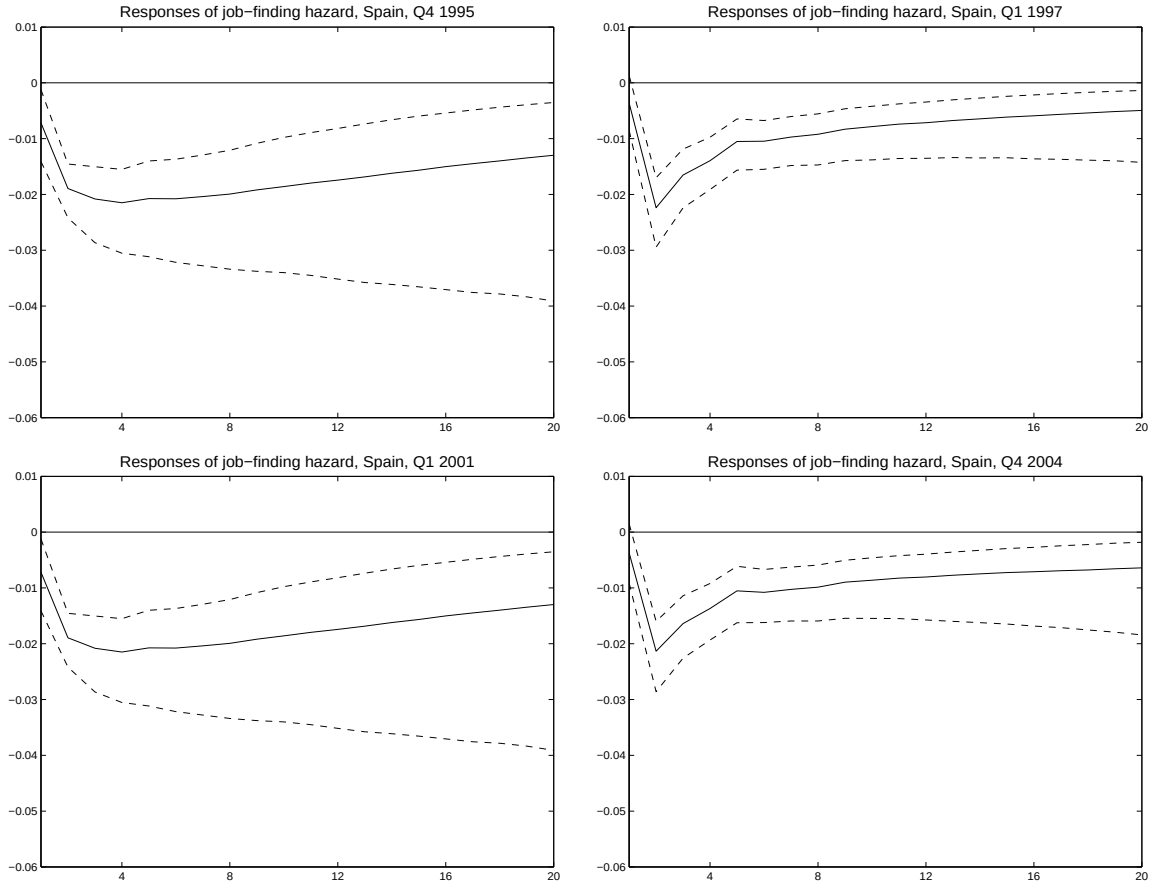


Figure A. 63. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

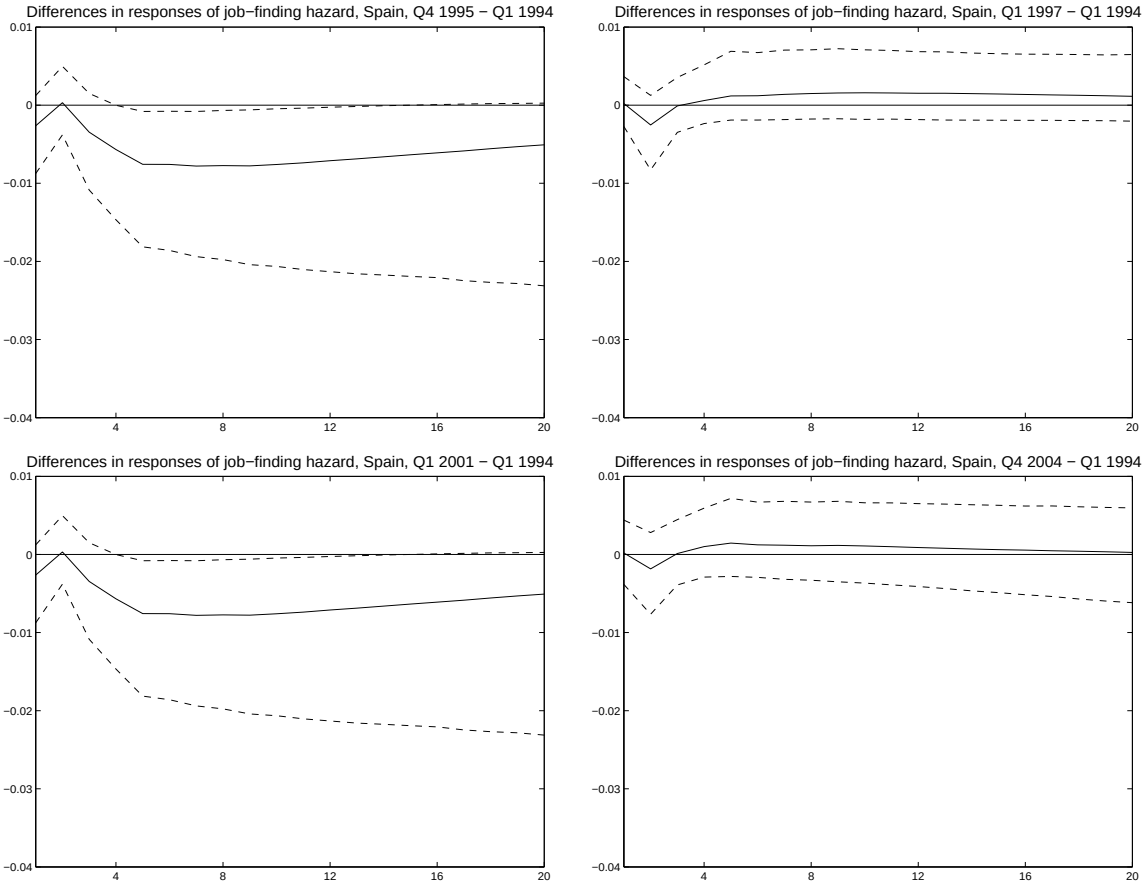


Figure A. 64. Differences in impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

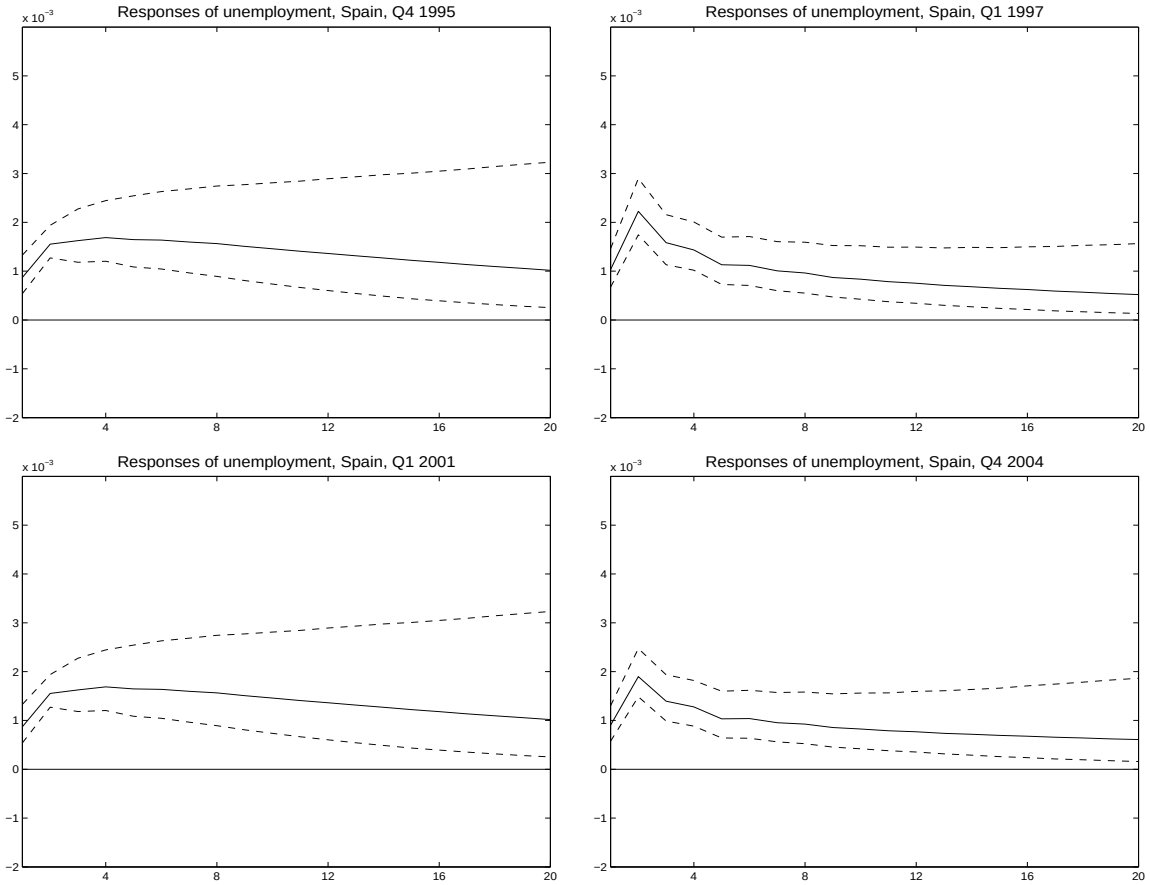


Figure A. 65. Impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

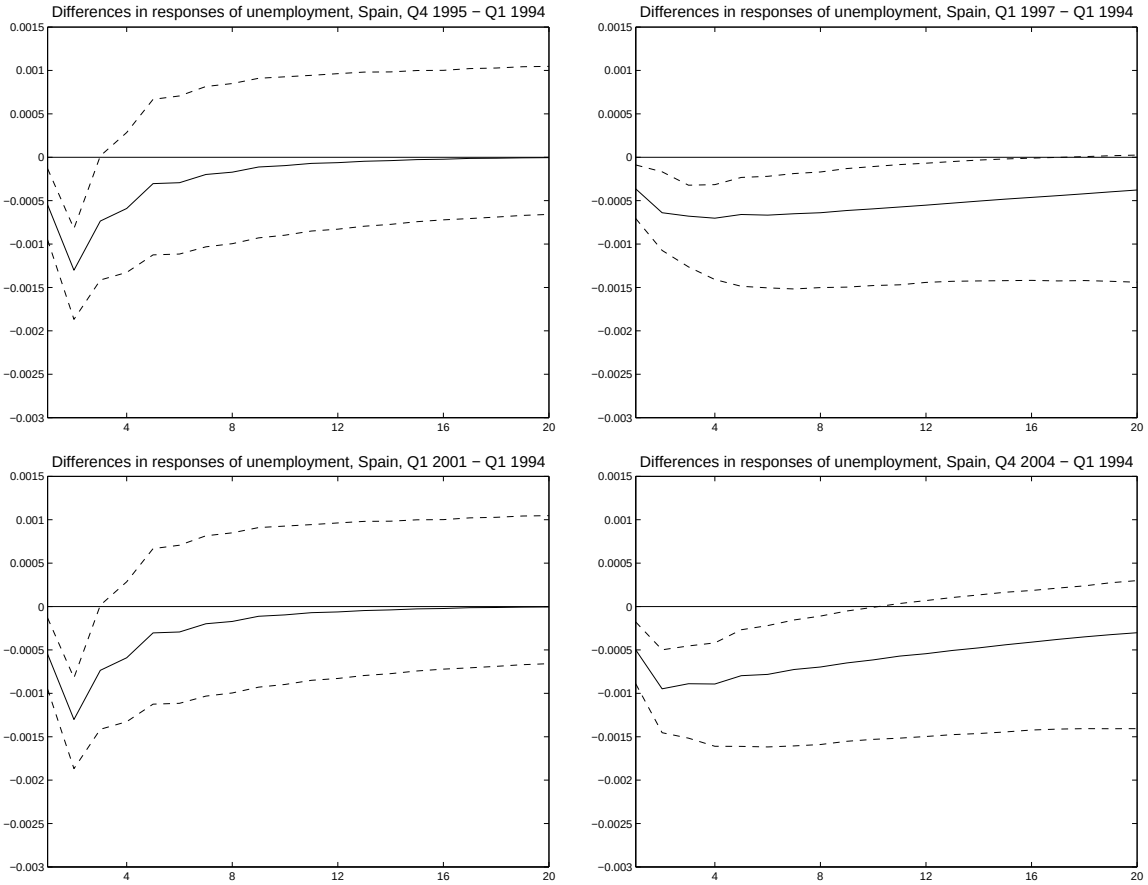


Figure A. 66. Differences in impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

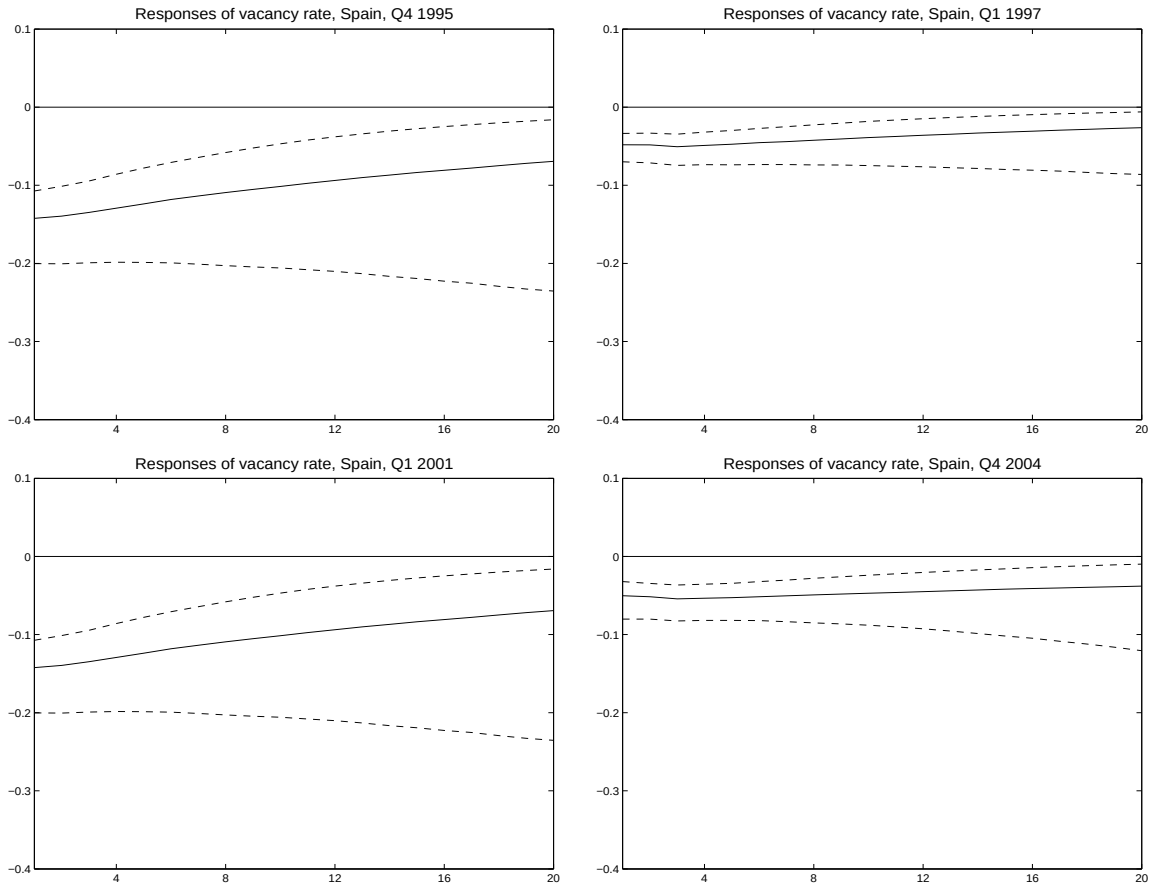


Figure A. 67. Impulse responses of vacancies -*Hete TVP-VAR*, Spain

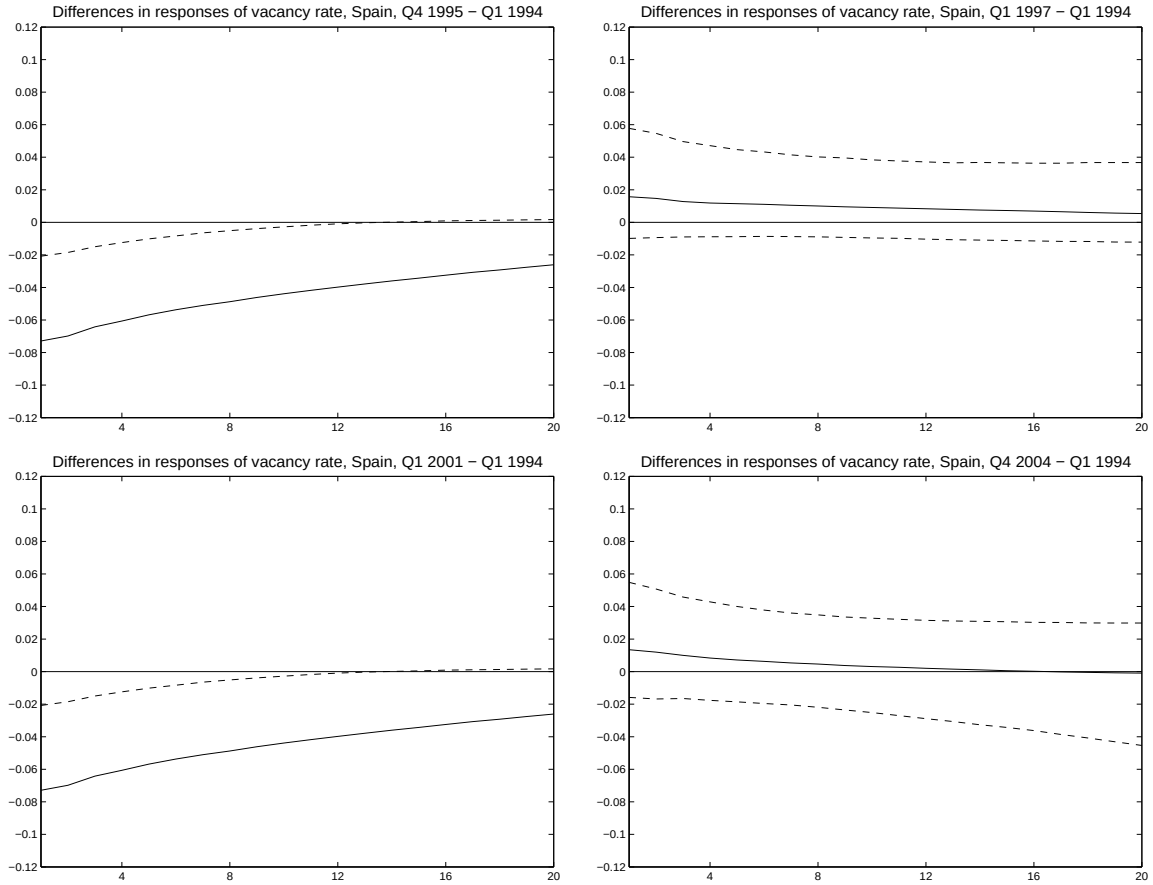


Figure A. 68. Differences in impulse responses of vacancies -*Hete TVP-VAR*, Spain

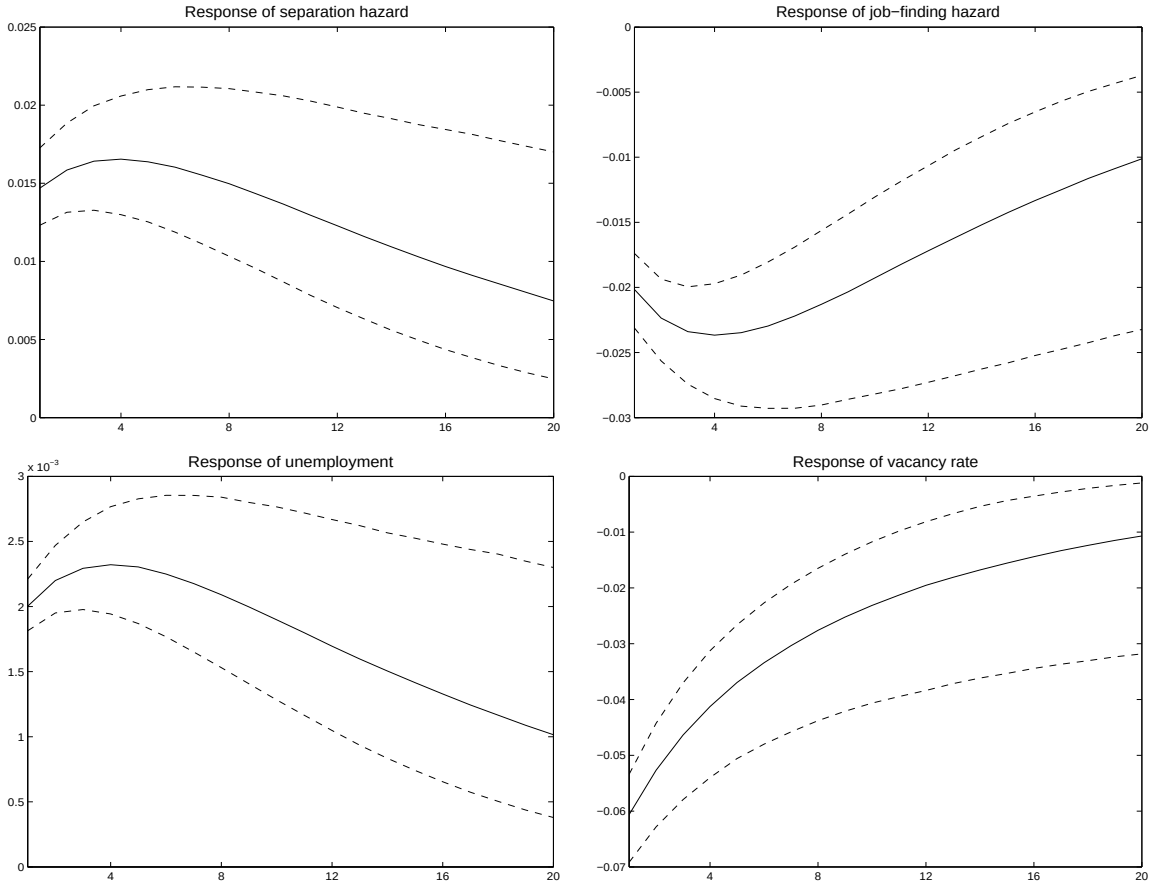


Figure A. 69. Impulse responses - *VAR*, UK

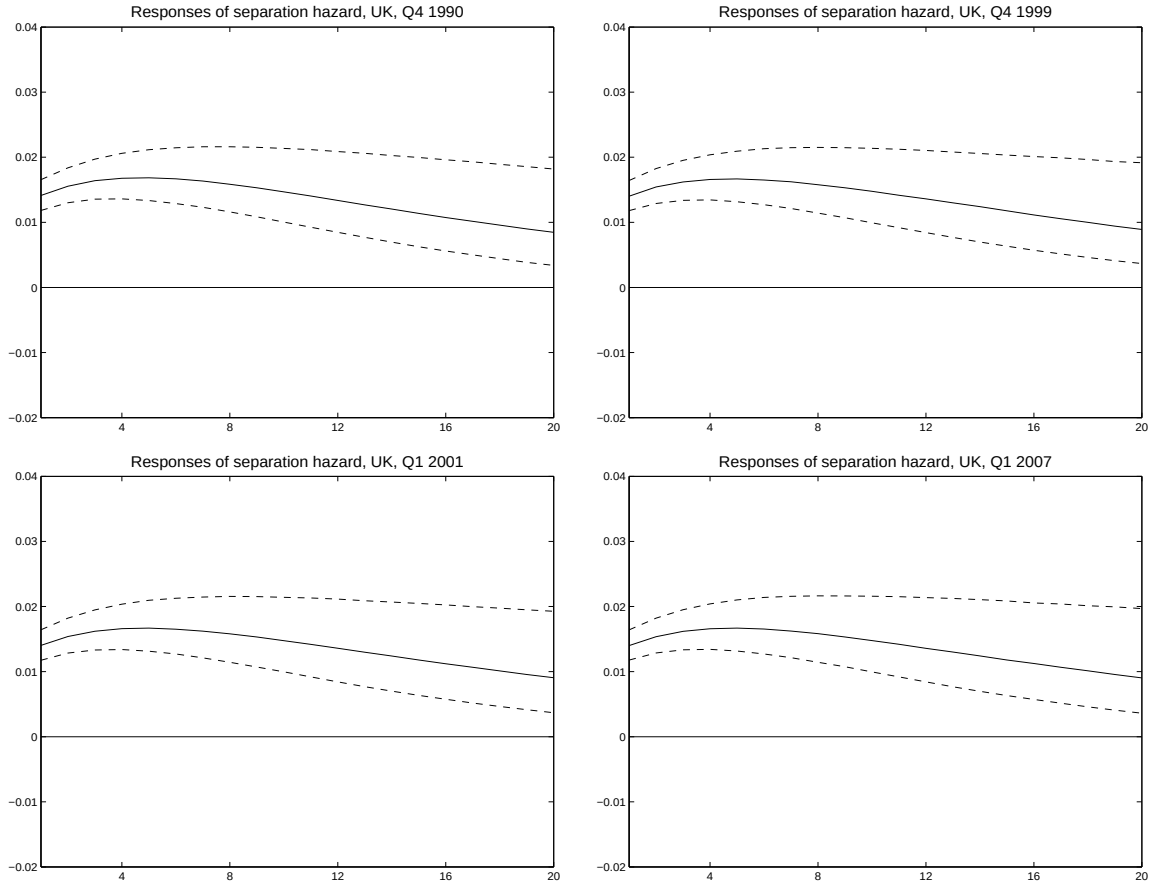


Figure A. 70. Impulse responses of separation hazards -*Homo TVP-VAR*, UK

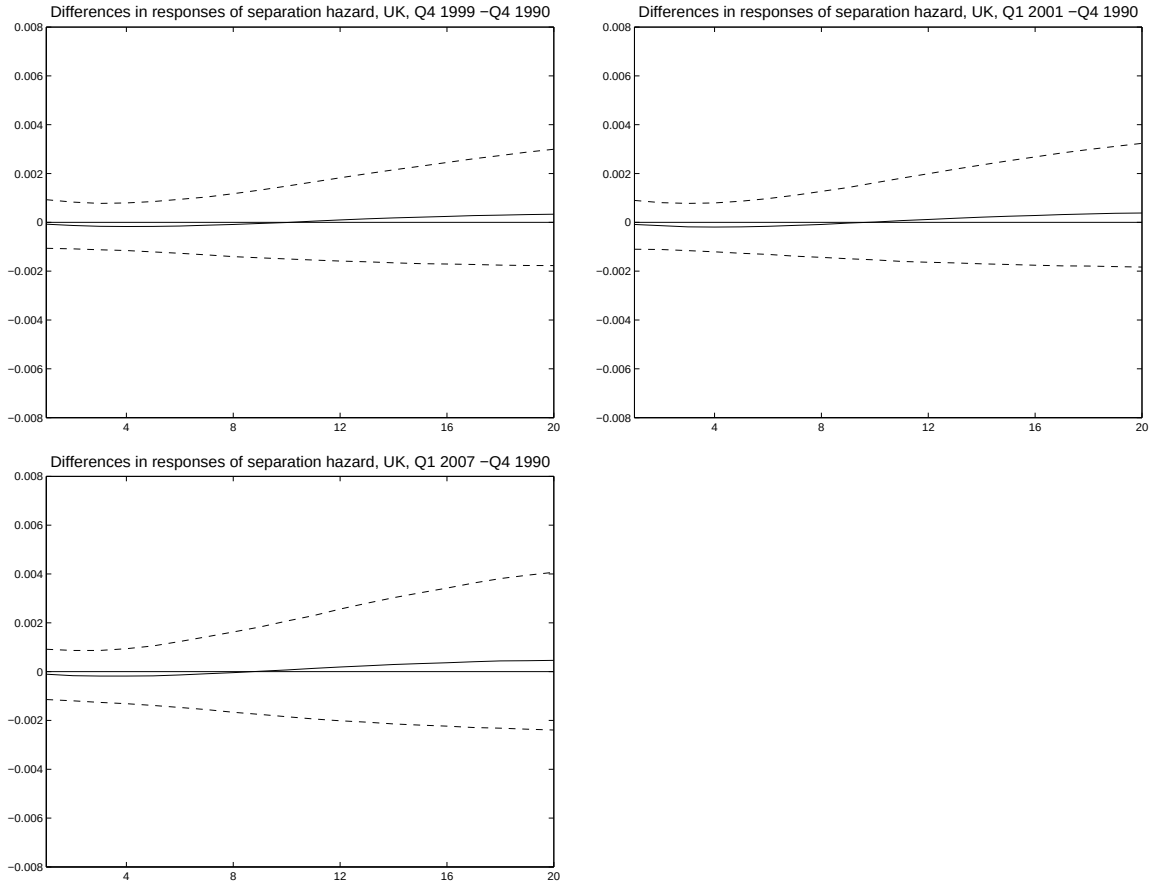


Figure A. 71. Differences in impulse responses of separation hazards -*Homo TVP-VAR*, UK

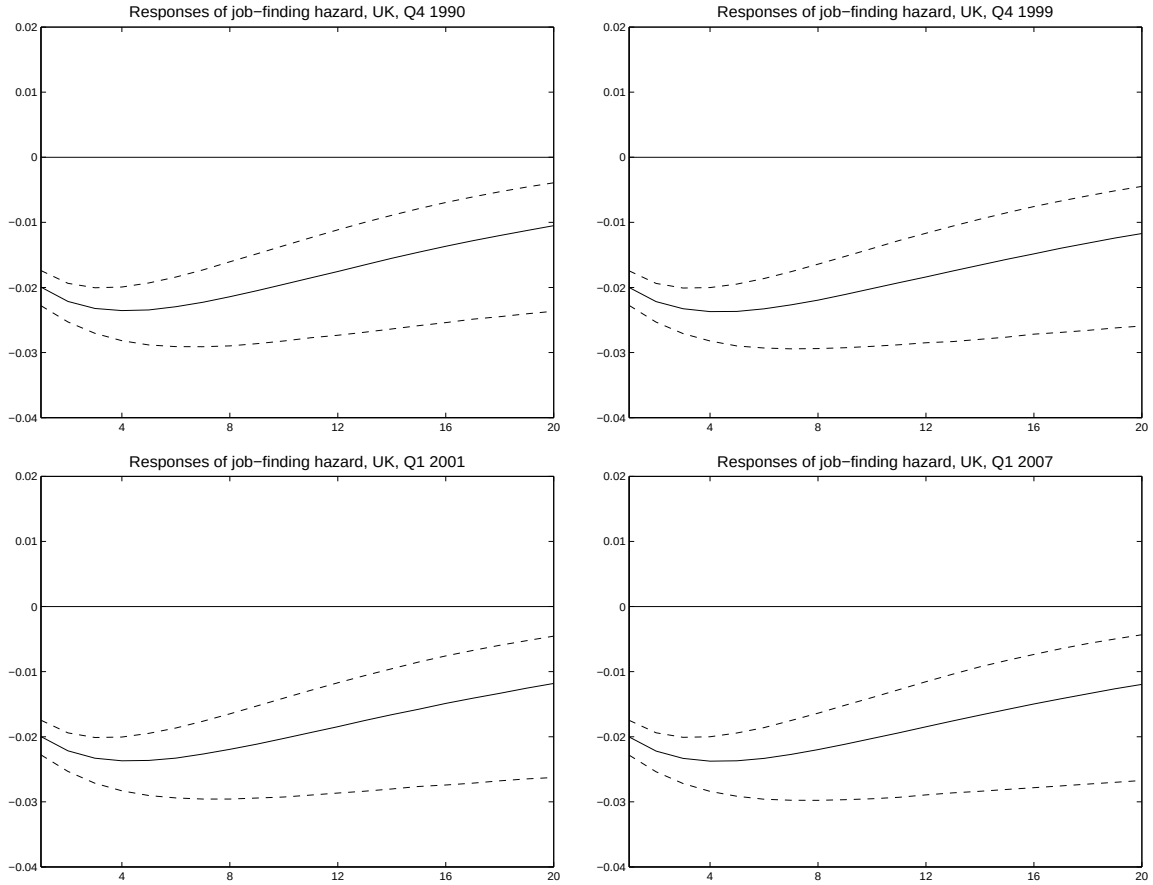


Figure A. 72. Impulse responses of job-finding hazards -*Homo TVP-VAR*, UK

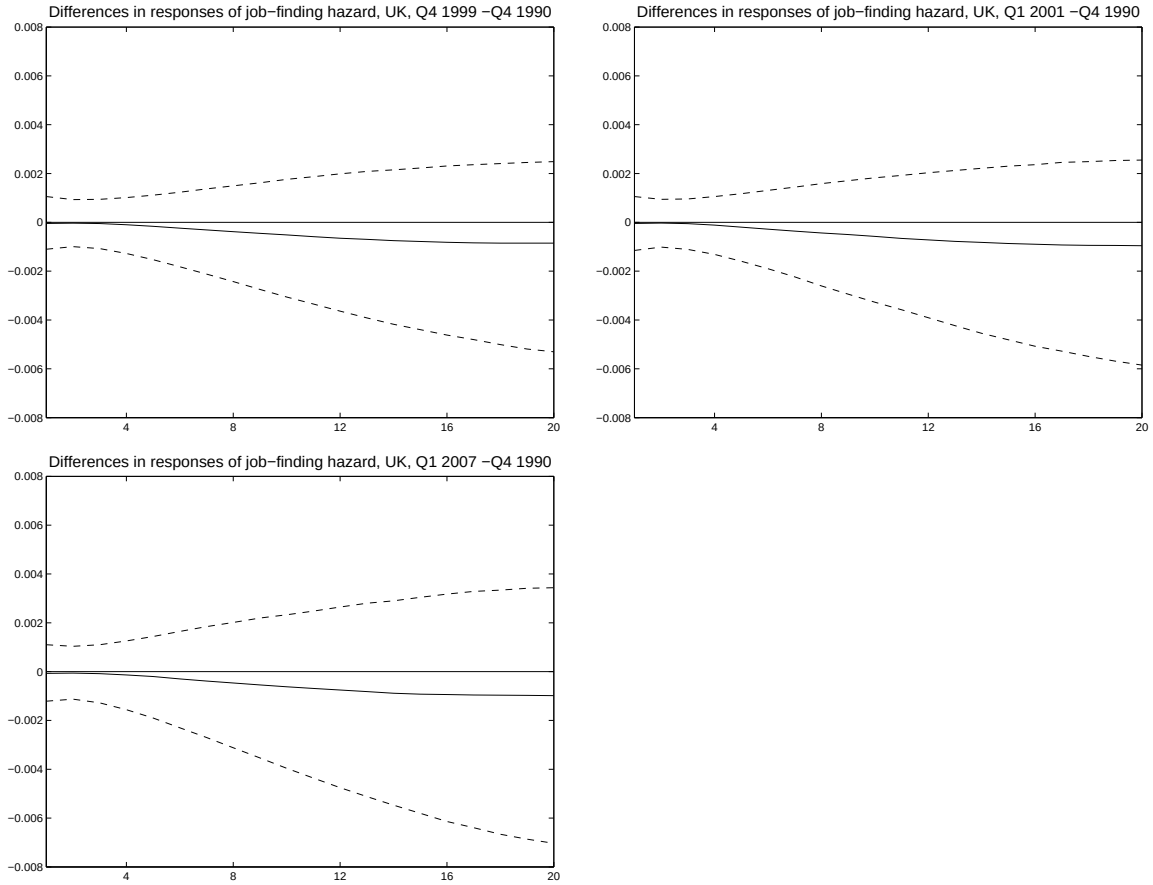


Figure A. 73. Differences in impulse responses of job-finding hazards -*Homo TVP-VAR*, UK

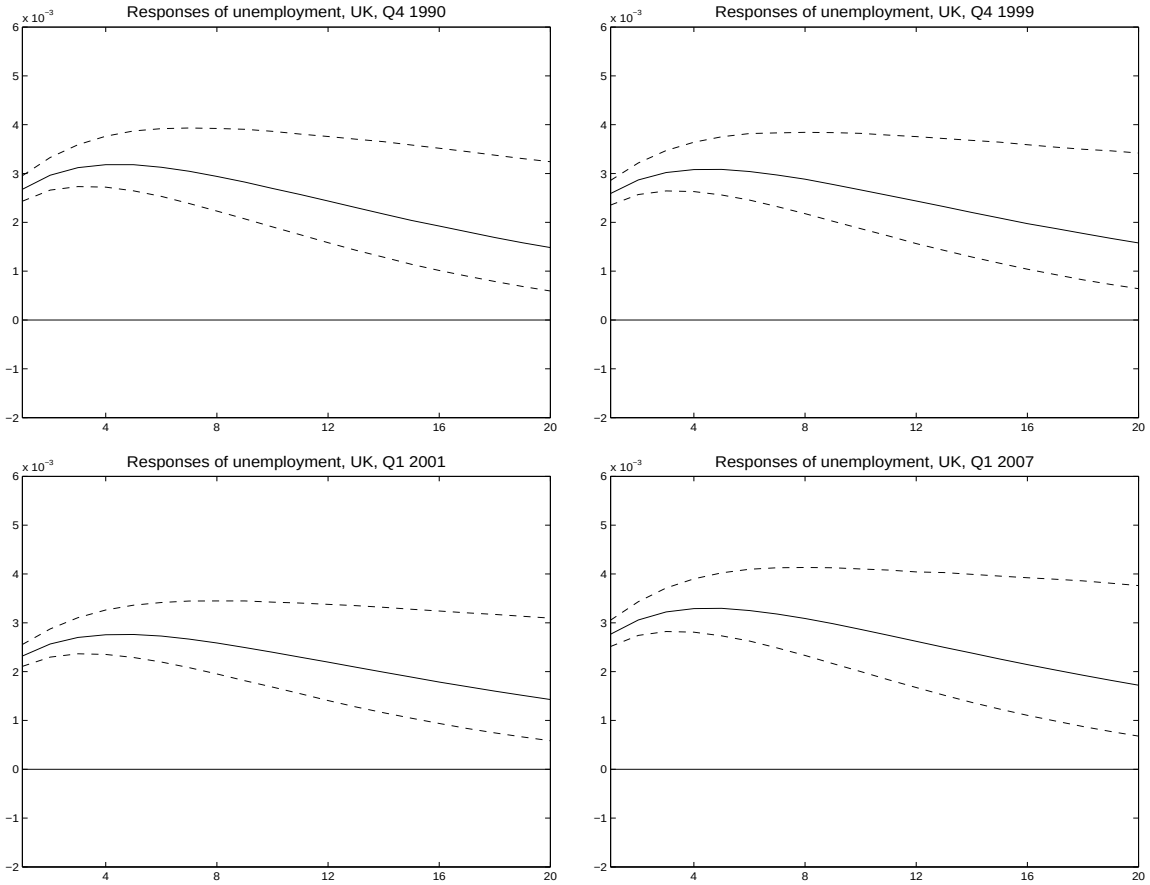


Figure A. 74. Impulse responses of unemployment rates -*Homo TVP-VAR*, UK

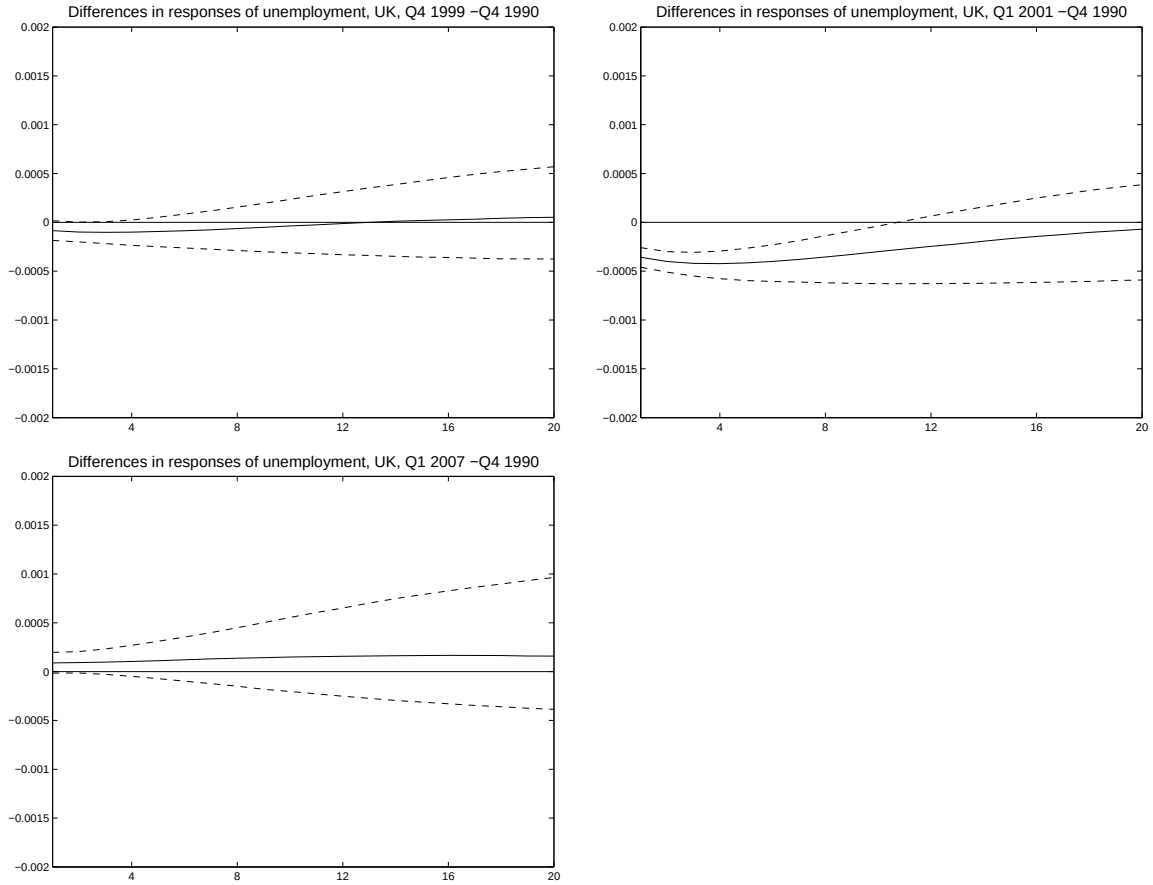


Figure A. 75. Differences in impulse responses of unemployment rates -*Homo TVP-VAR*, UK

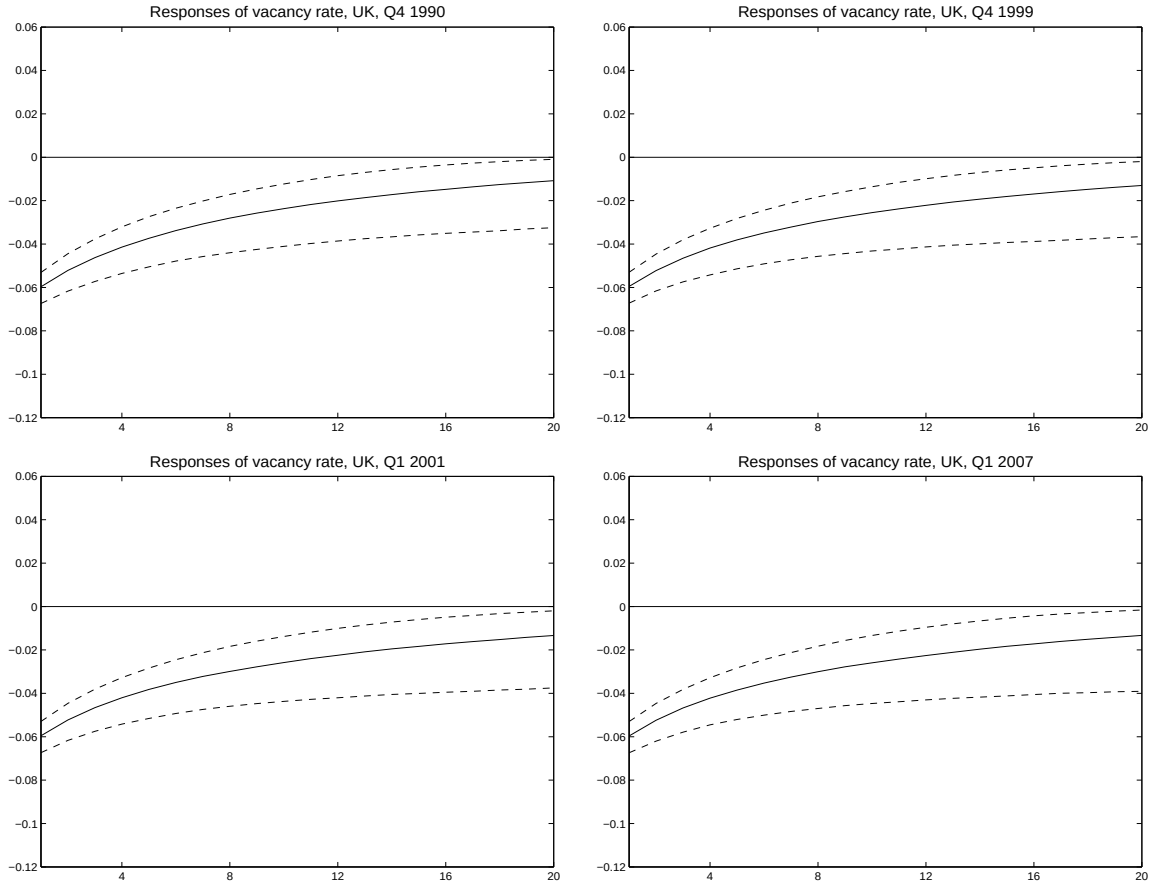


Figure A. 76. Impulse responses of vacancies -*Homo TVP-VAR*, UK

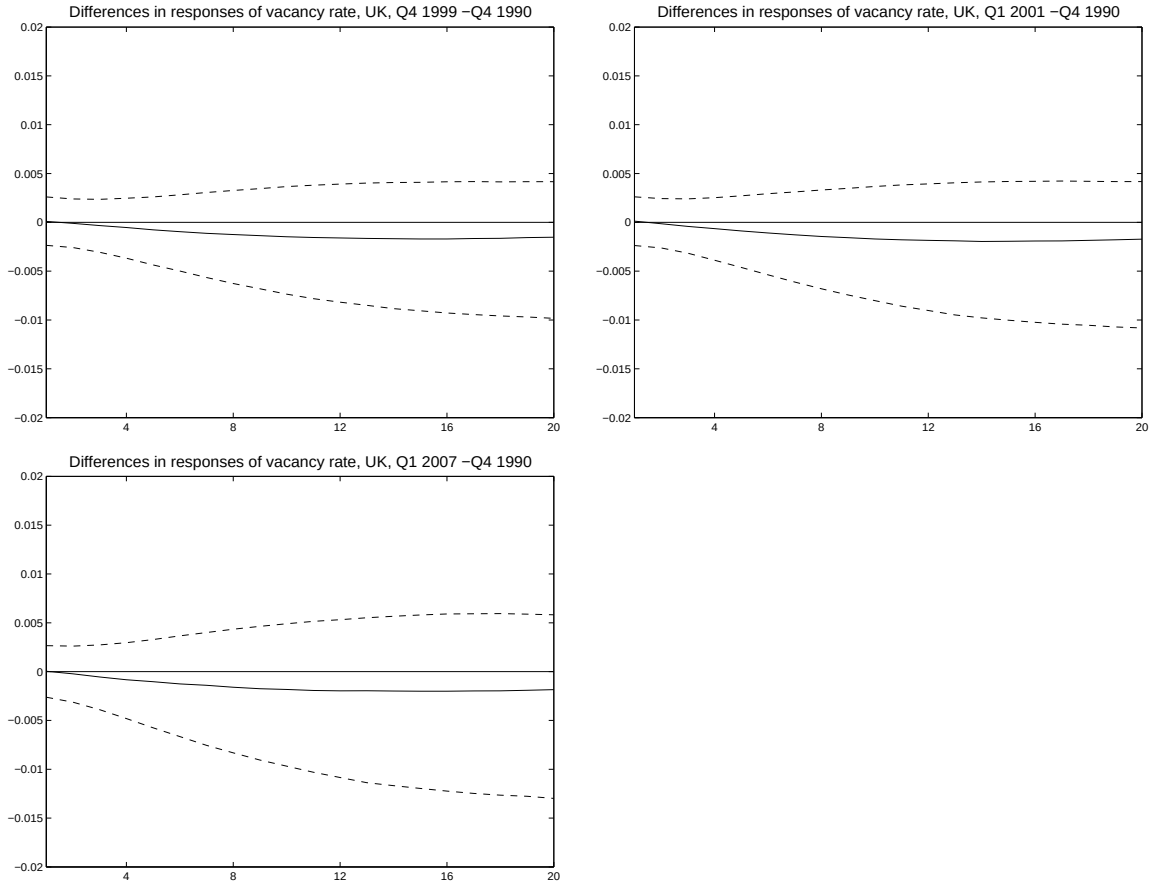


Figure A. 77. Differences in impulse responses of vacancies -*Homo TVP-VAR*, UK

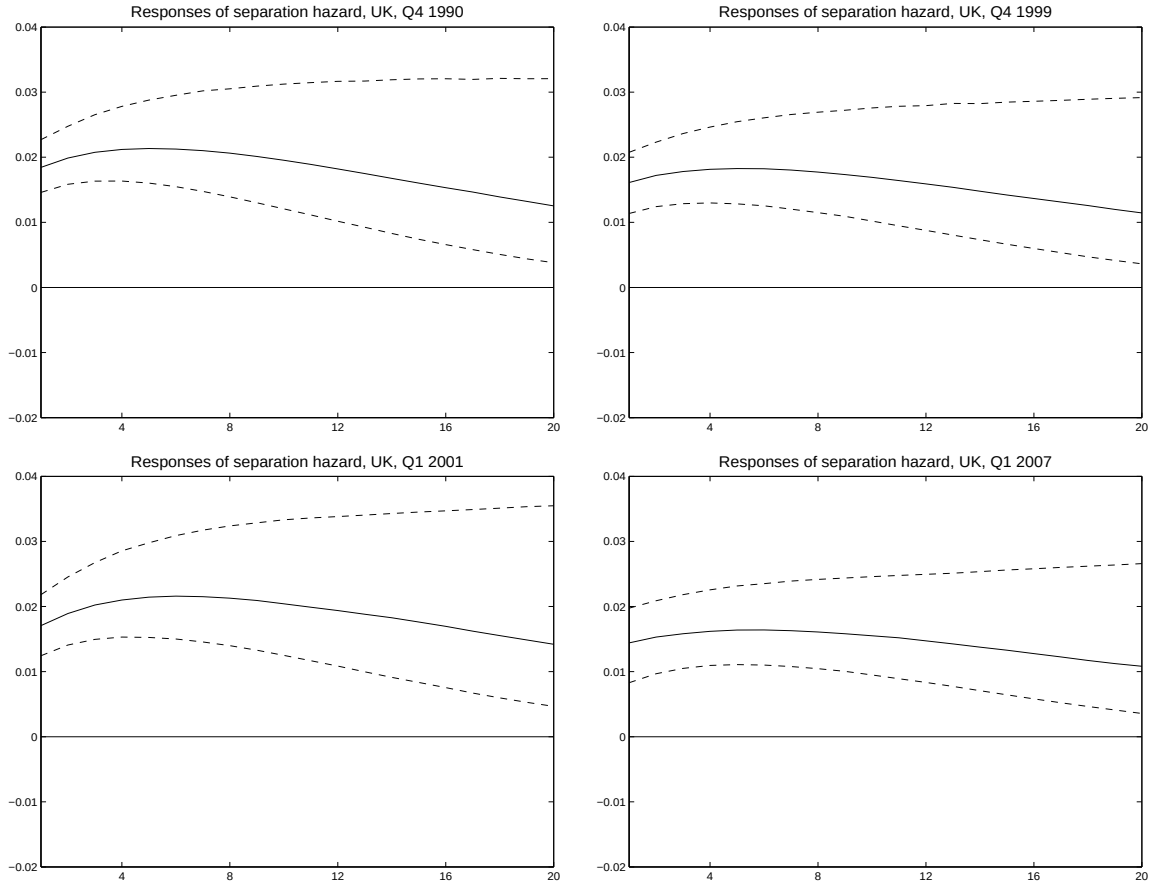


Figure A. 78. Impulse responses of separation hazards -*Hete TVP-VAR*, UK

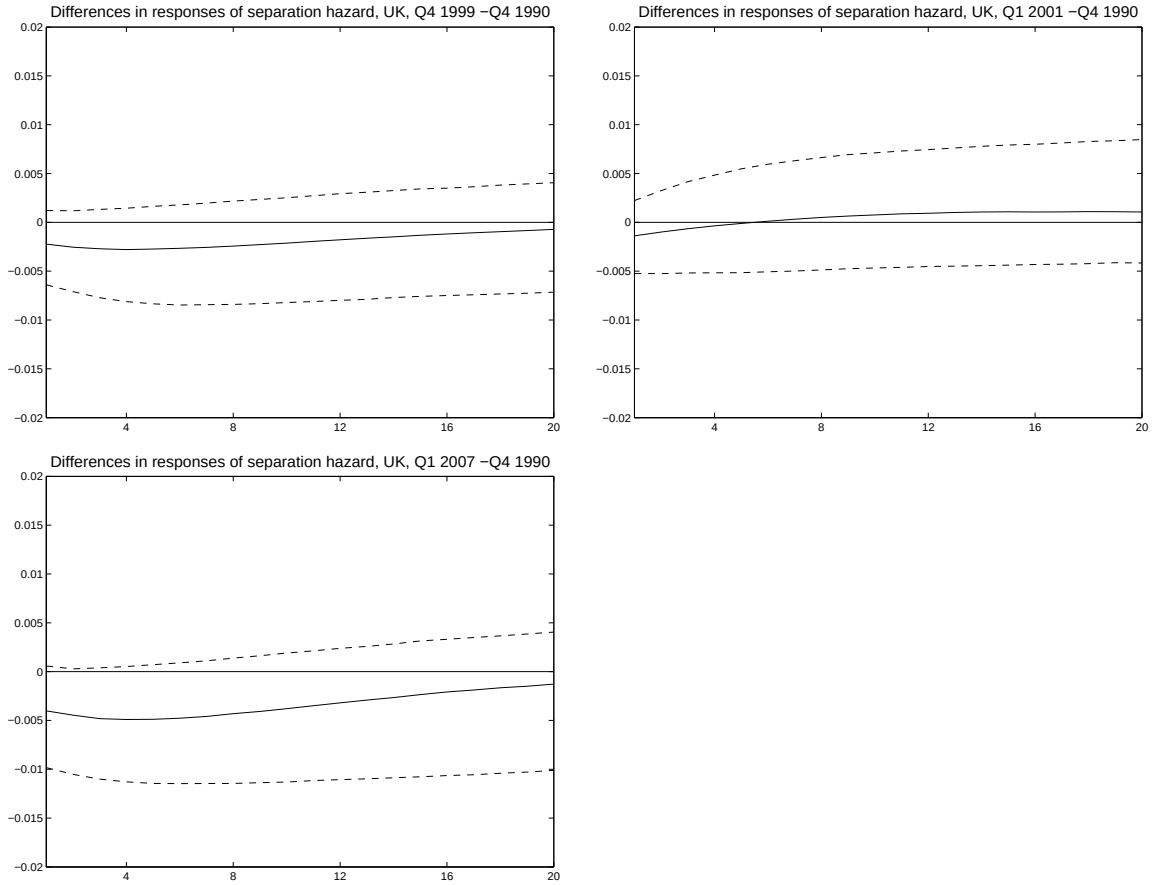


Figure A. 79. Differences in impulse responses of separation hazards -*Hete TVP-VAR*, UK

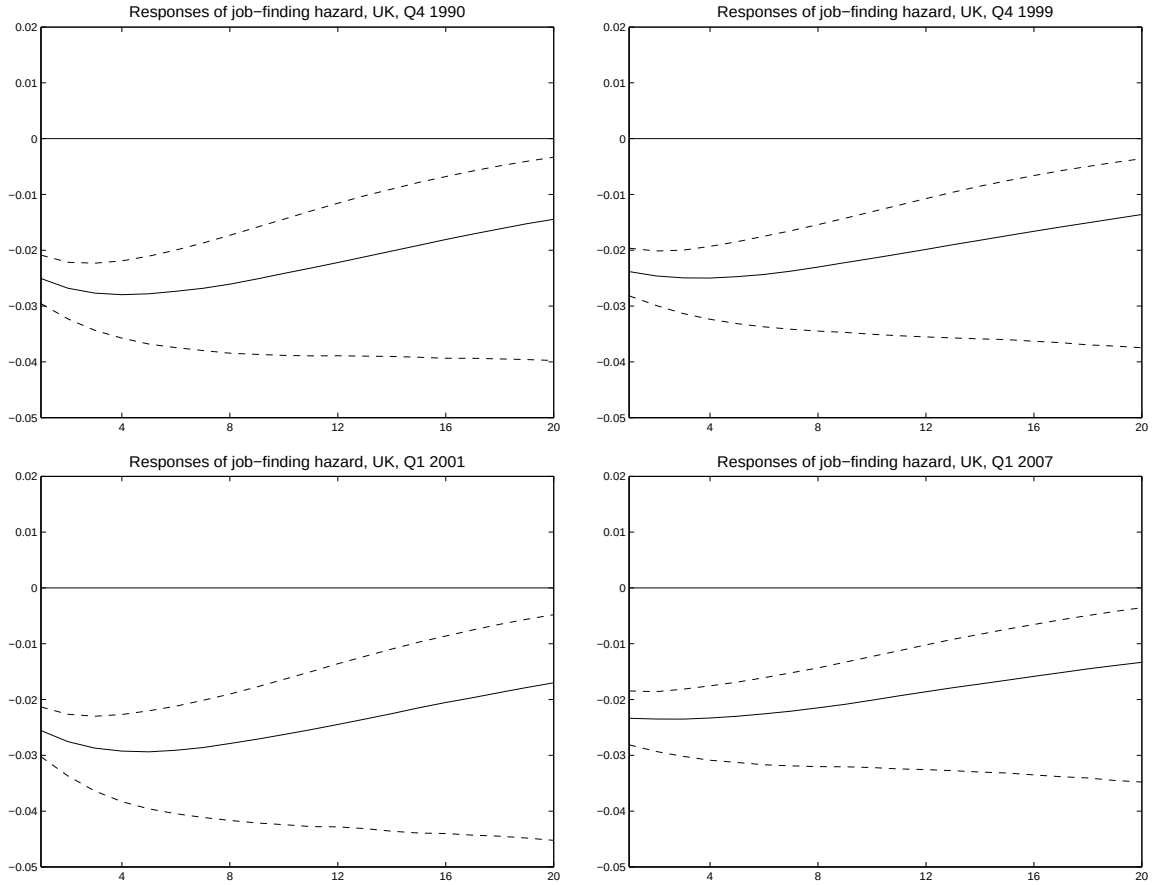


Figure A. 80. Impulse responses of job-finding hazards -*Hete TVP-VAR*, UK

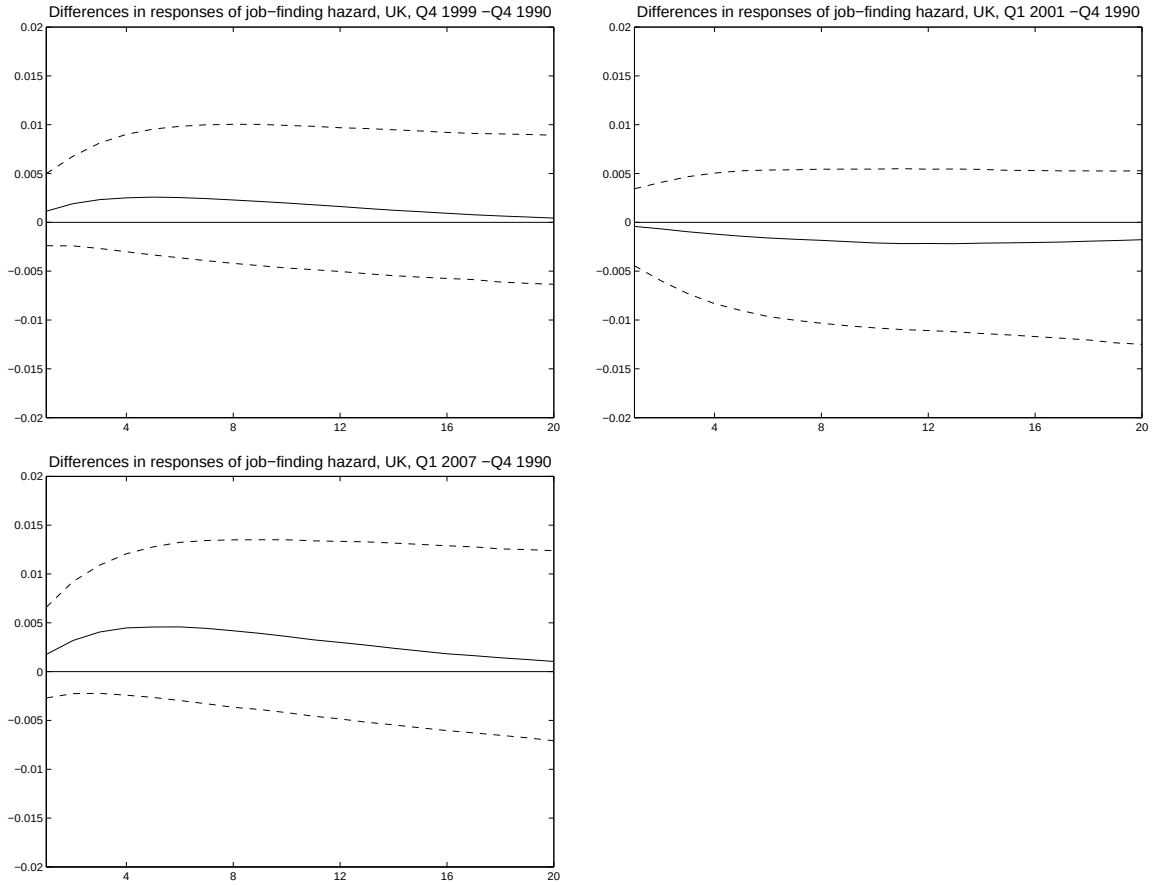


Figure A. 81. Differences in impulse responses of job-finding hazards -*Hete TVP-VAR*, UK

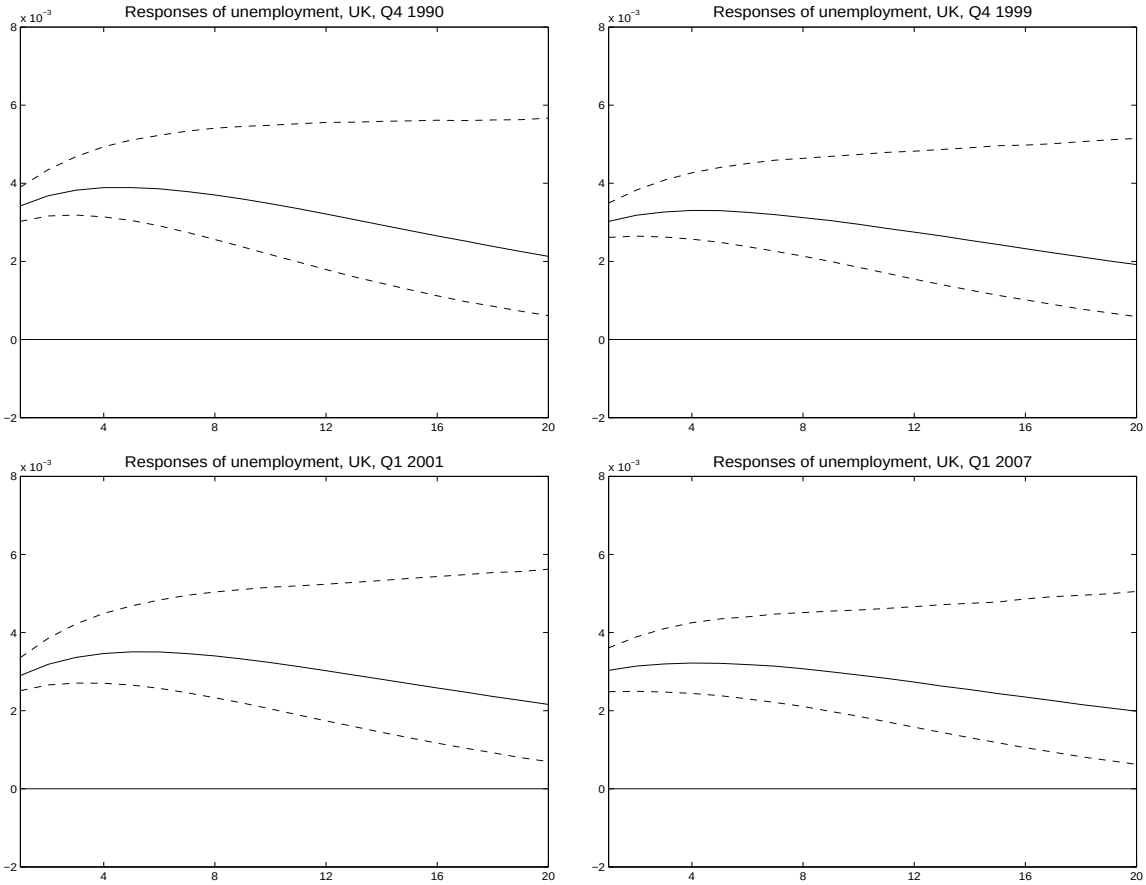


Figure A. 82. Impulse responses of unemployment rates -*Hete TVP-VAR*, UK

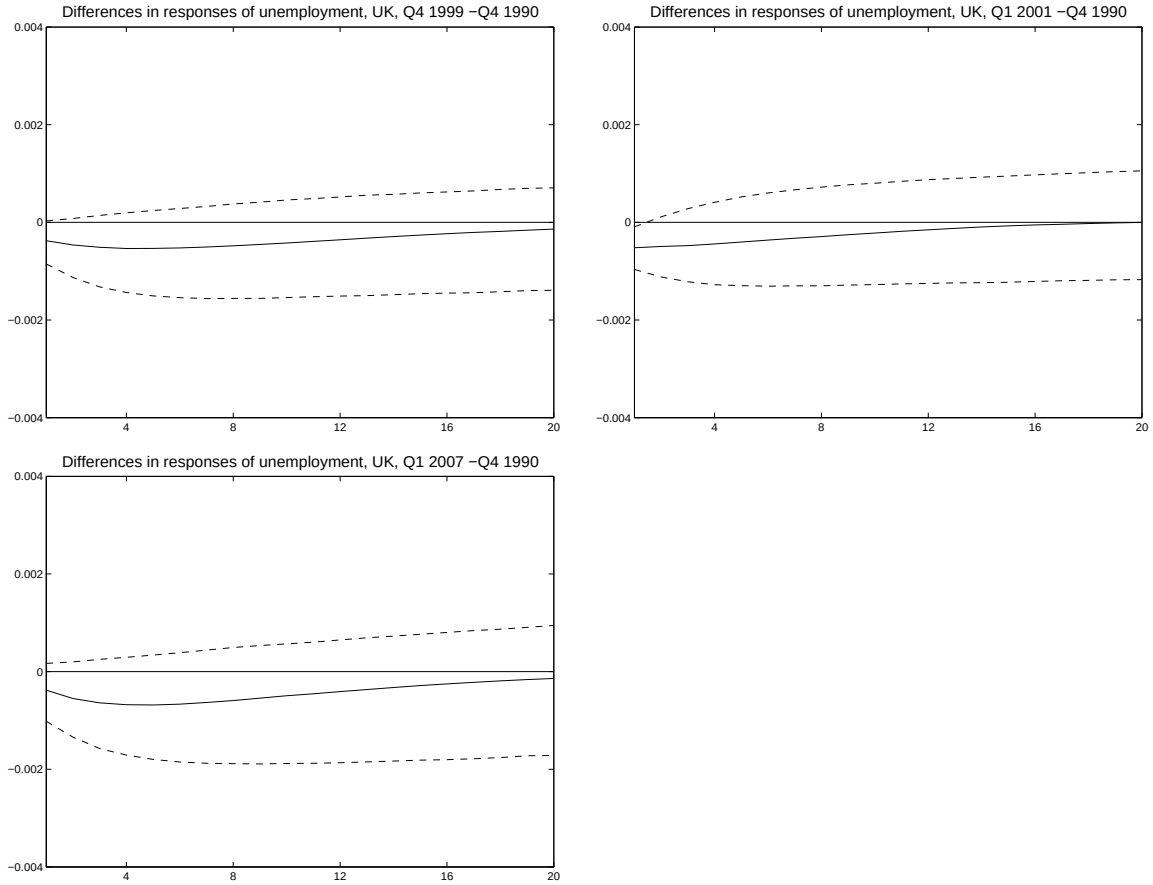


Figure A. 83. Differences in impulse responses of unemployment rates -*Hete TVP-VAR*, UK

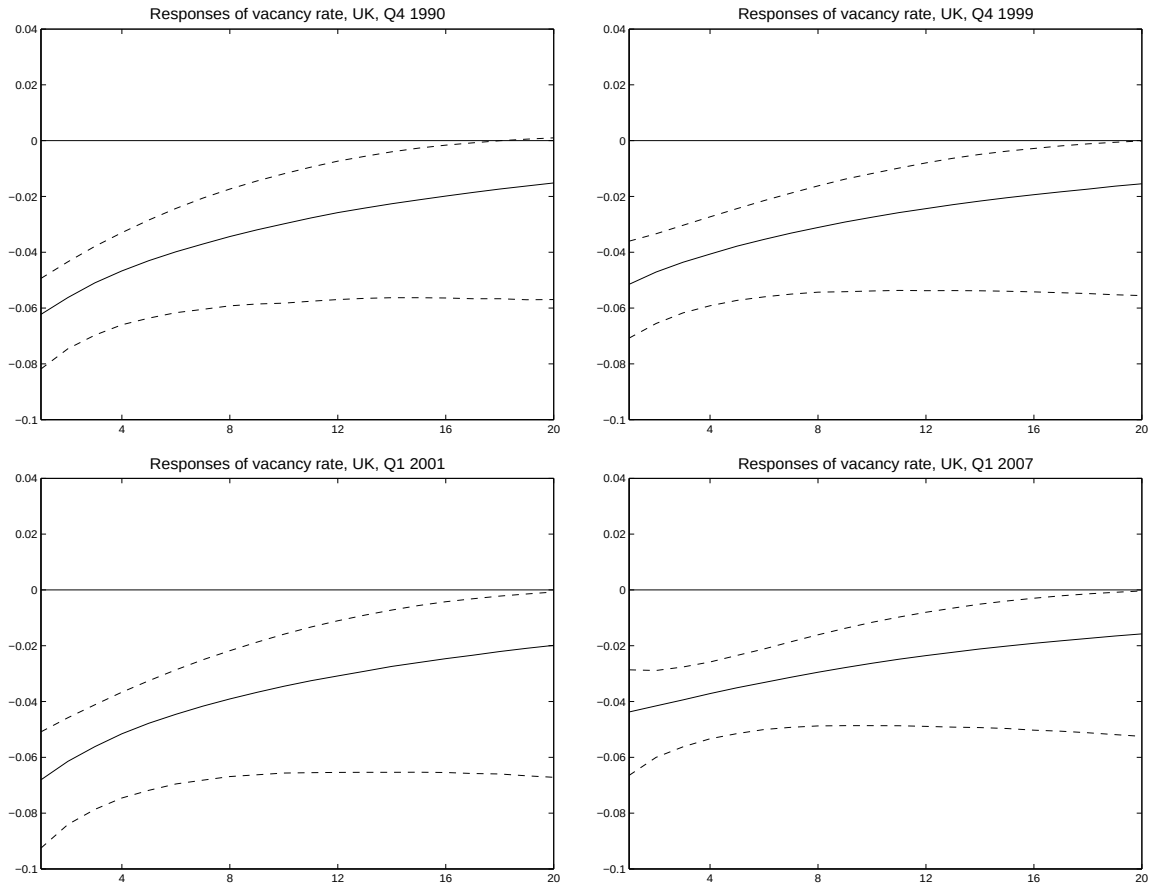


Figure A. 84. Impulse responses of vacancies -*Hete TVP-VAR*, UK

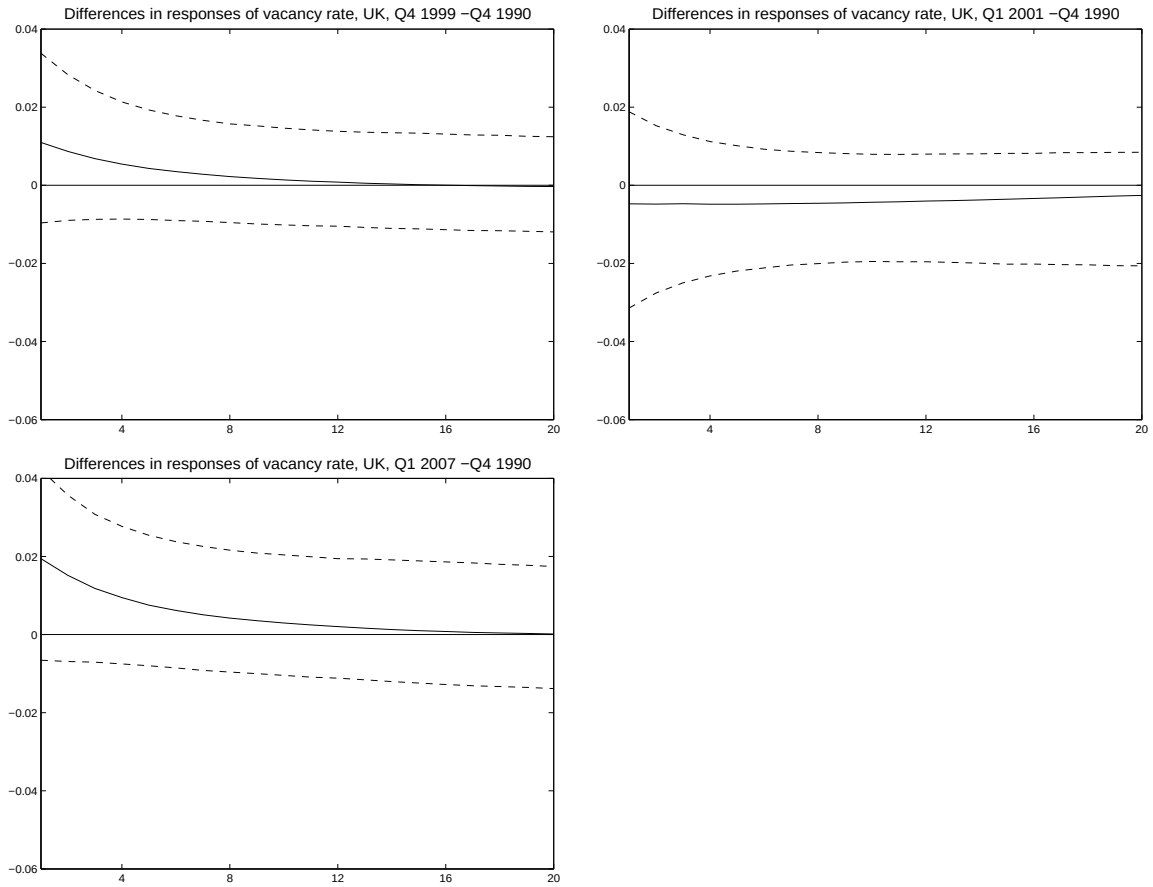


Figure A. 85. Differences in impulse responses of vacancies -*Hete TVP-VAR*, UK

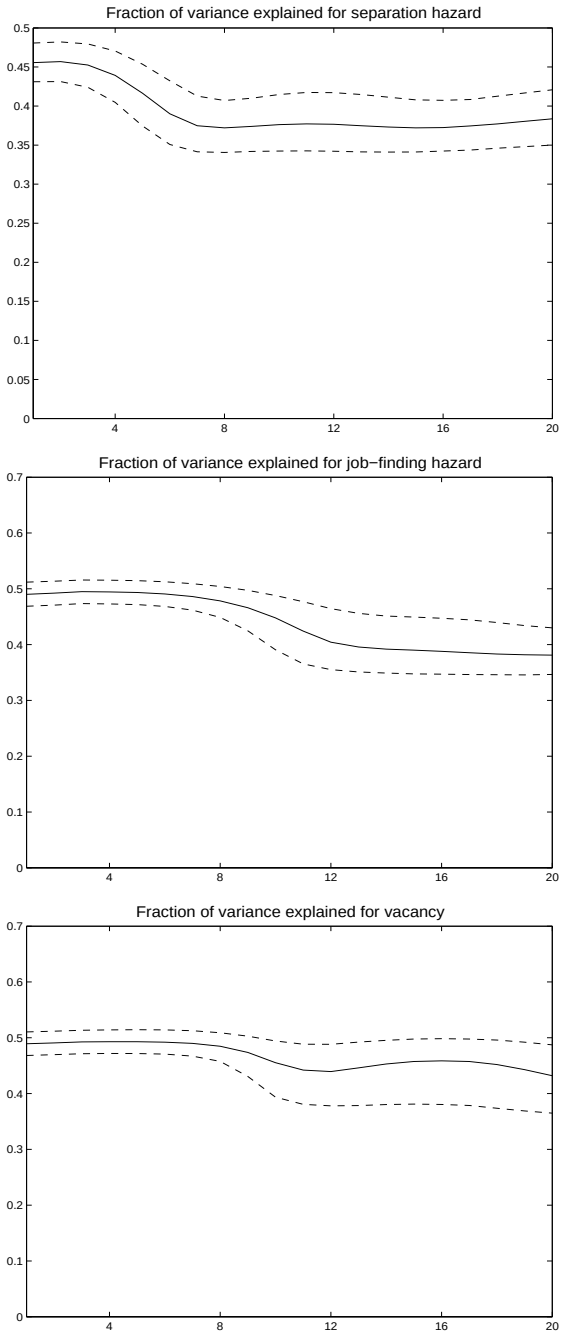


Figure A. 86. Variance decompositions - VAR, US

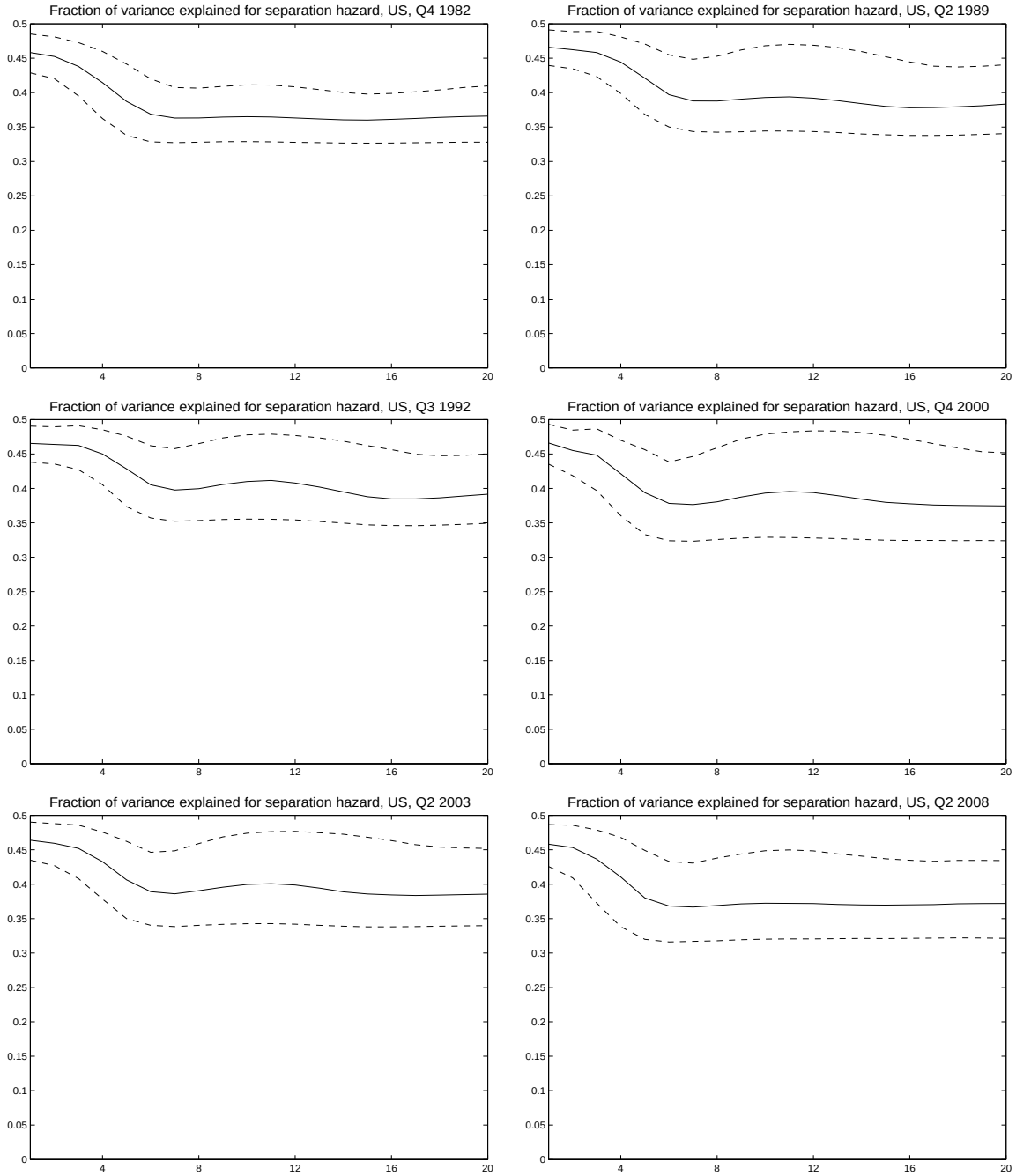


Figure A. 87. Variance decomposition for separation hazards -*Homo TVP-VAR*, US

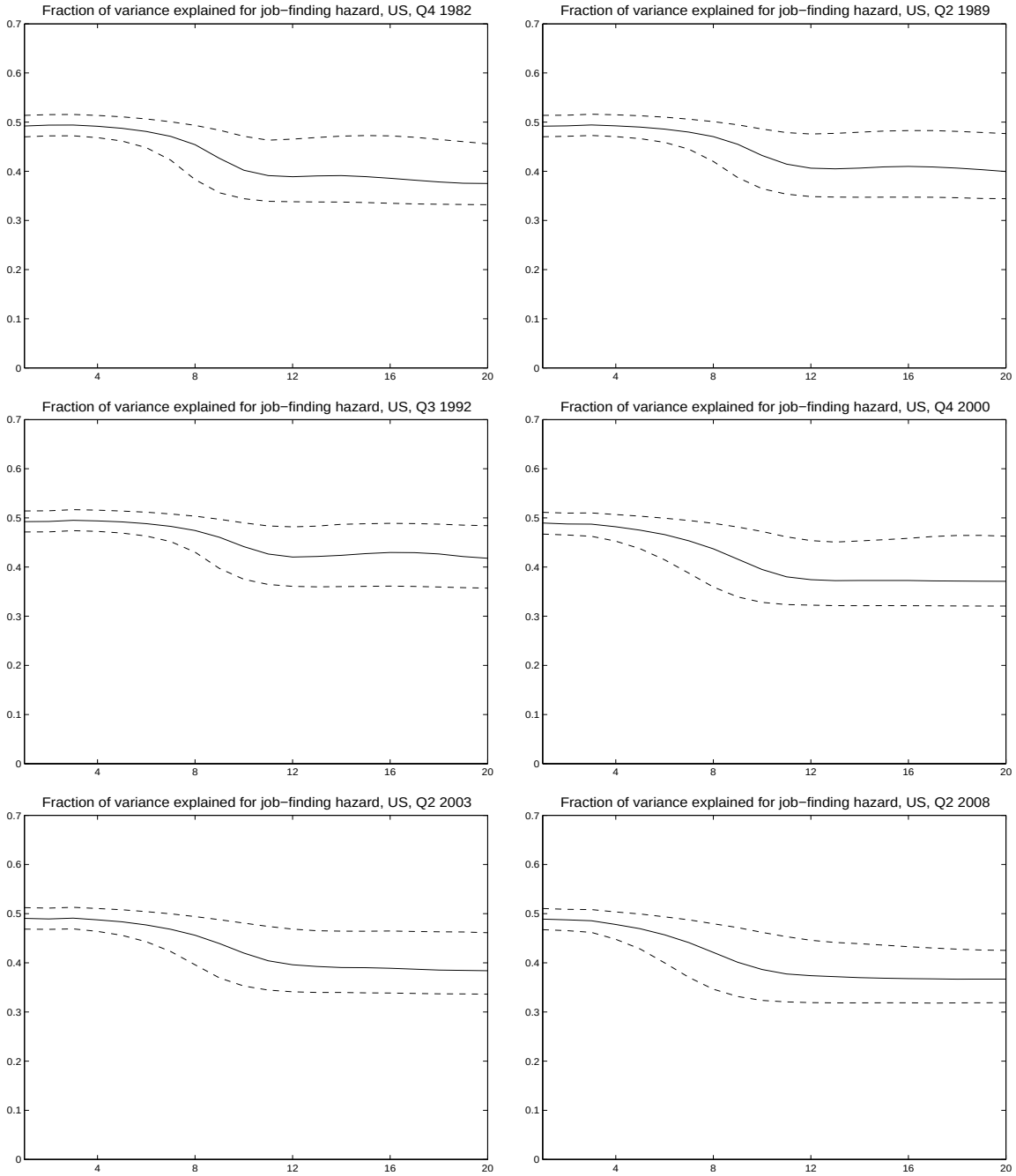


Figure A. 88. Variance decomposition for job-finding hazards -*Homo TVP-VAR*, US

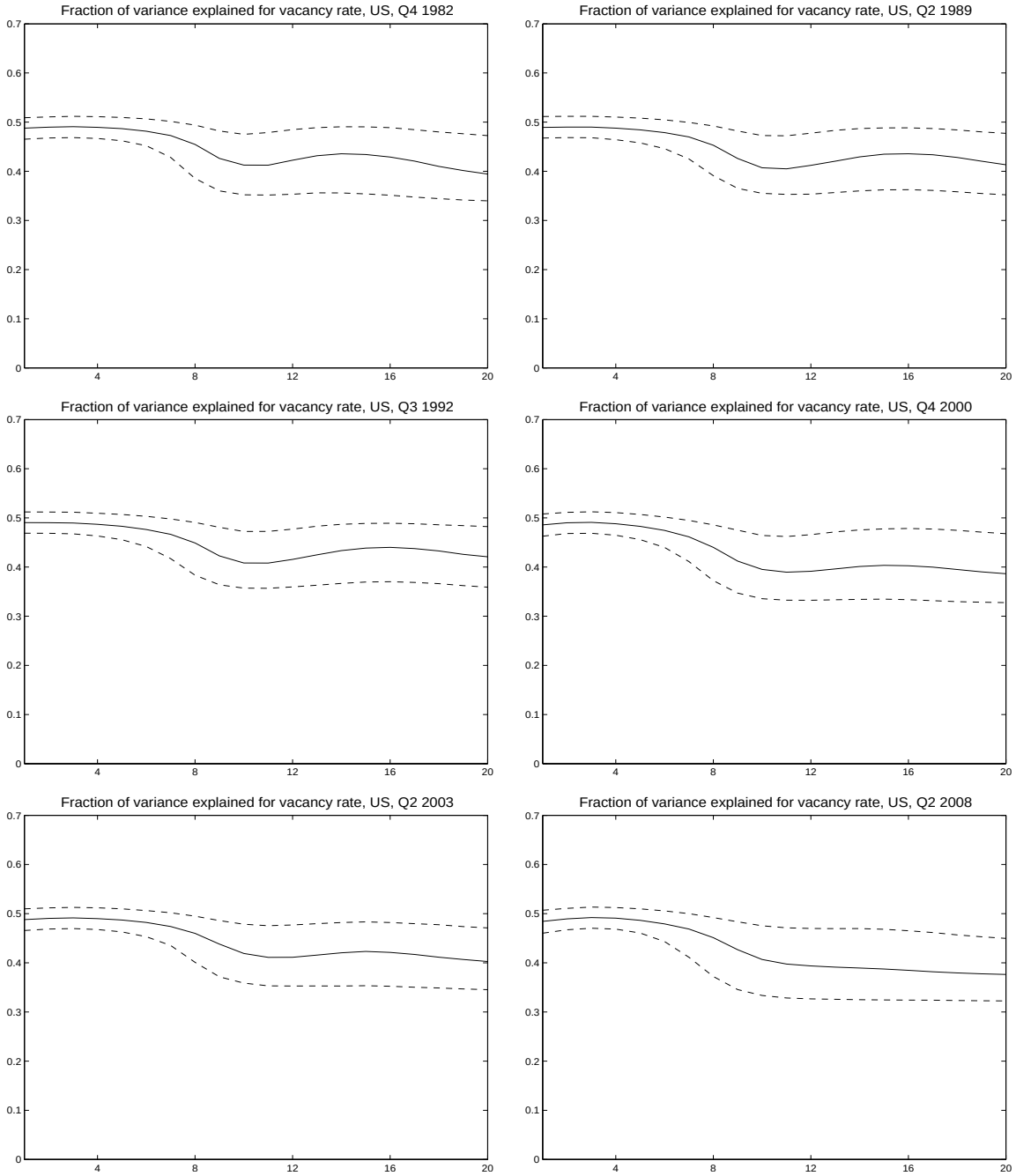


Figure A. 89. Variance decomposition for vacancies -*Homo TVP-VAR*, US

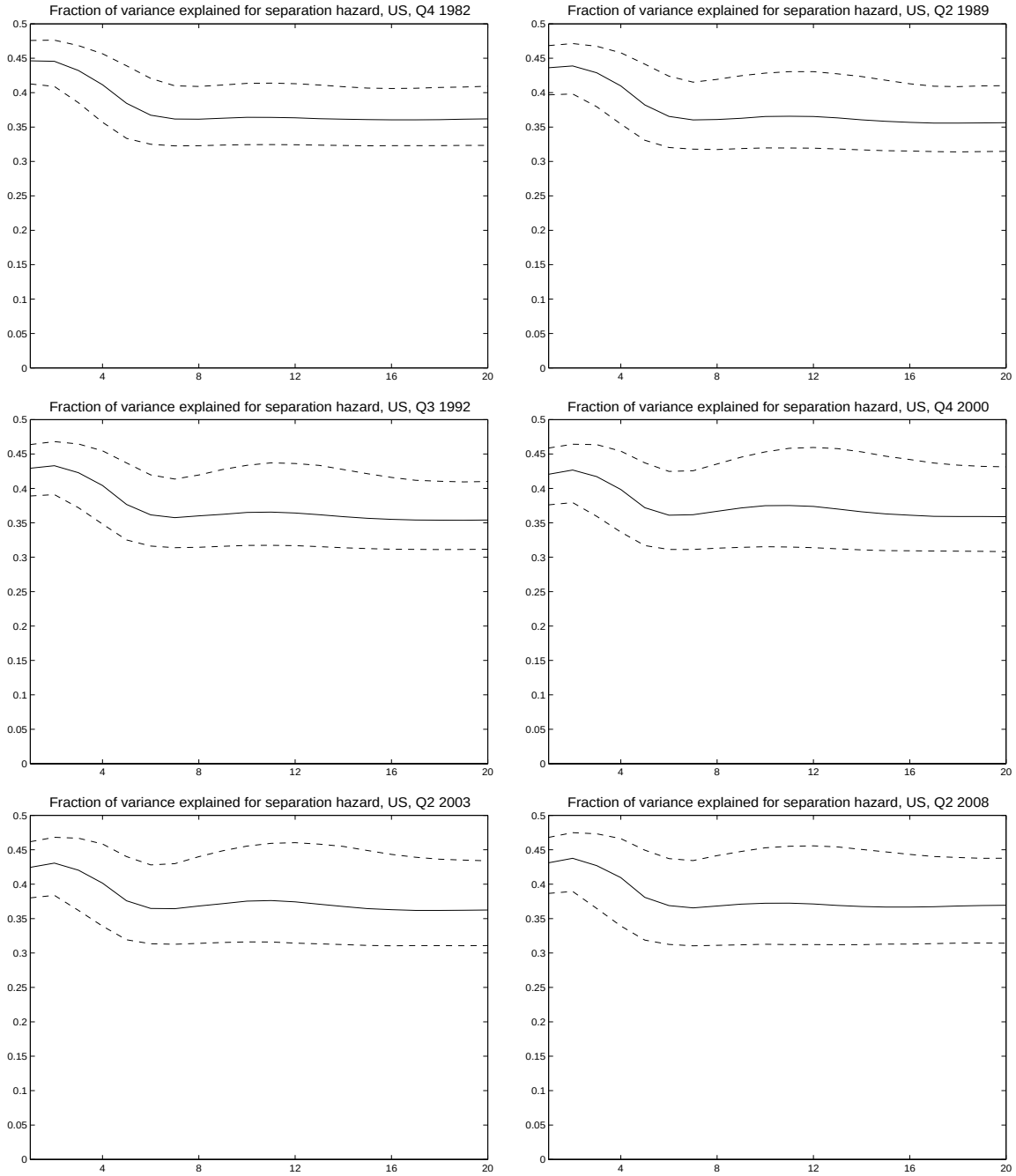


Figure A. 90. Variance decomposition for separation hazards -*Hete TVP-VAR*, US

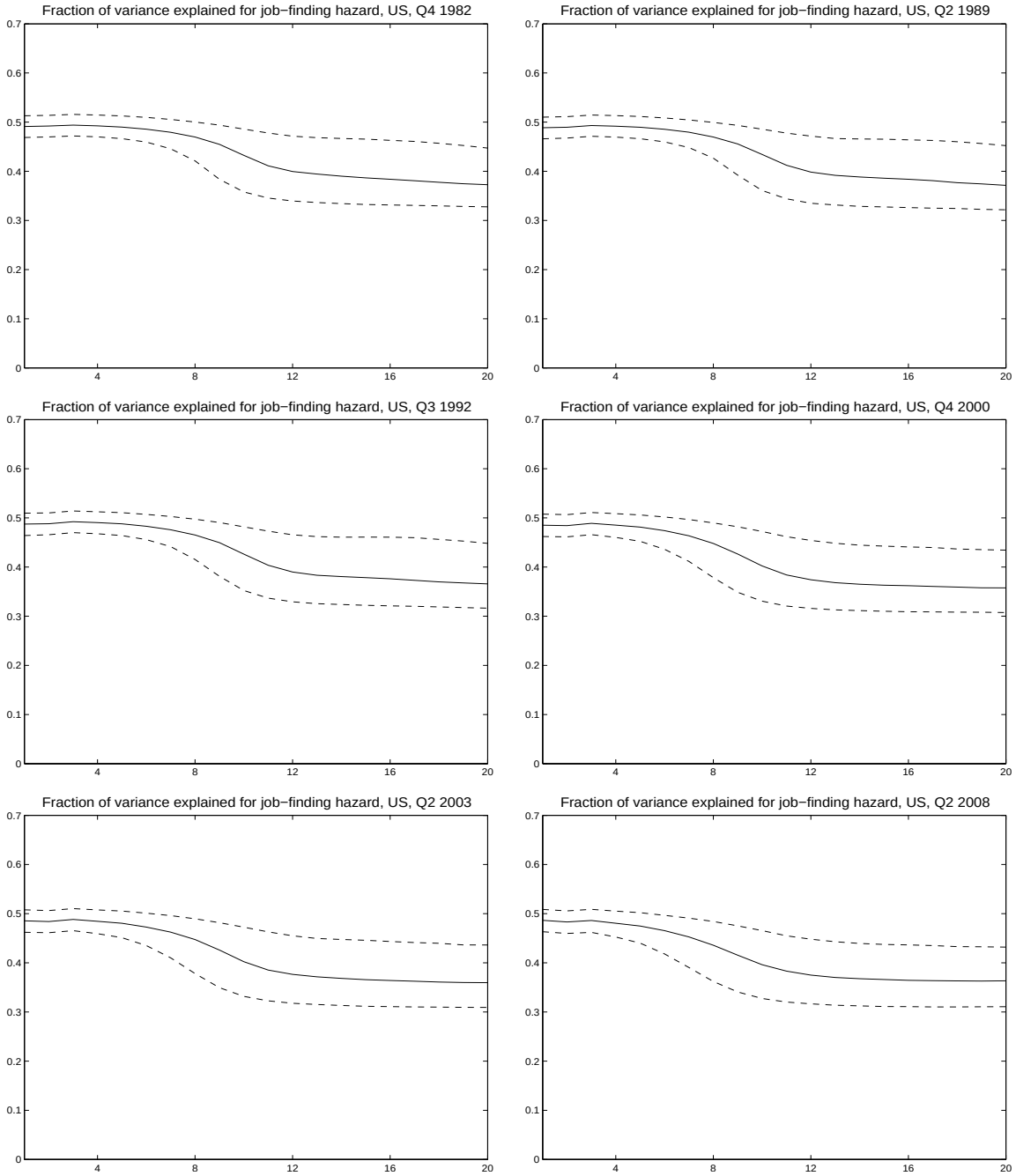


Figure A. 91. Variance decomposition for job-finding hazards -*Hete TVP-VAR*, US

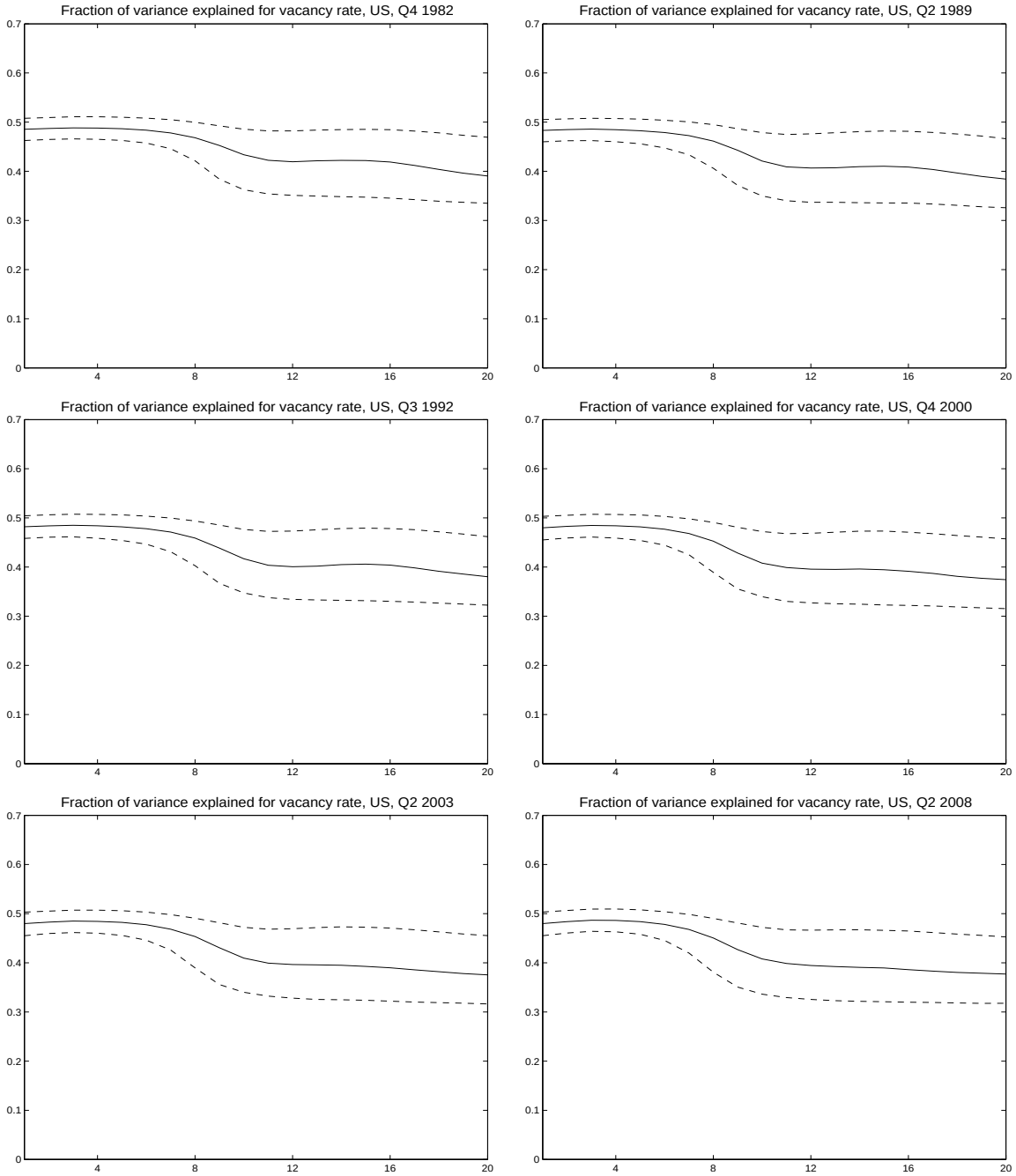


Figure A. 92. Variance decomposition for vacancies -*Hete TVP-VAR*, US

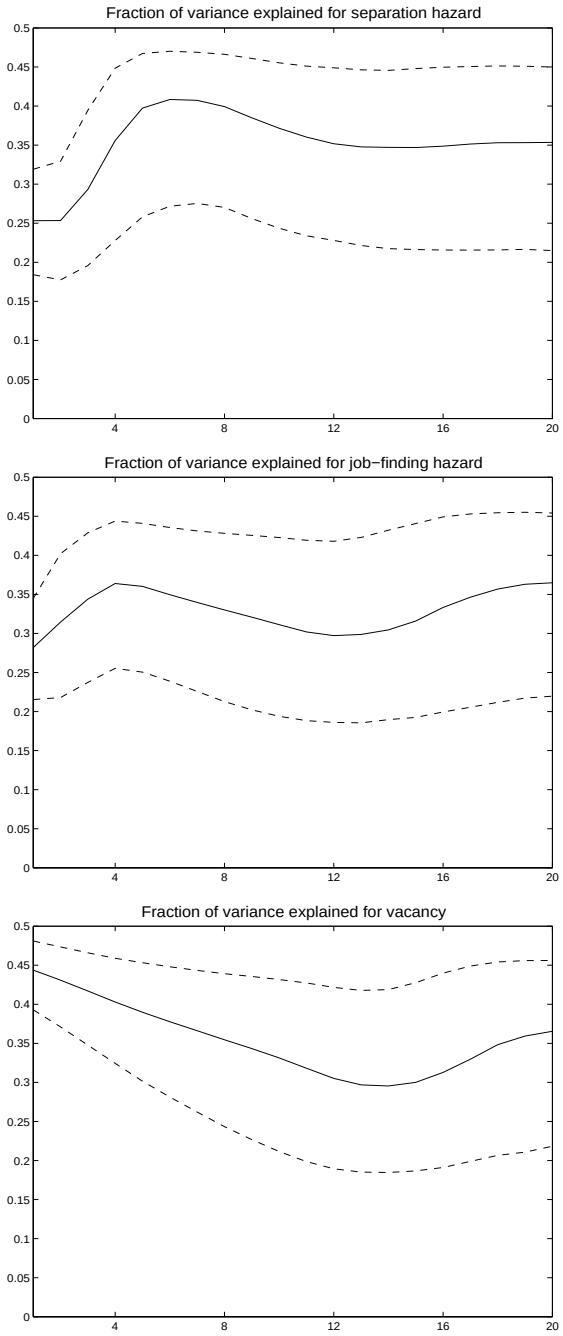


Figure A. 93. Variance decompositions - VAR, Canada

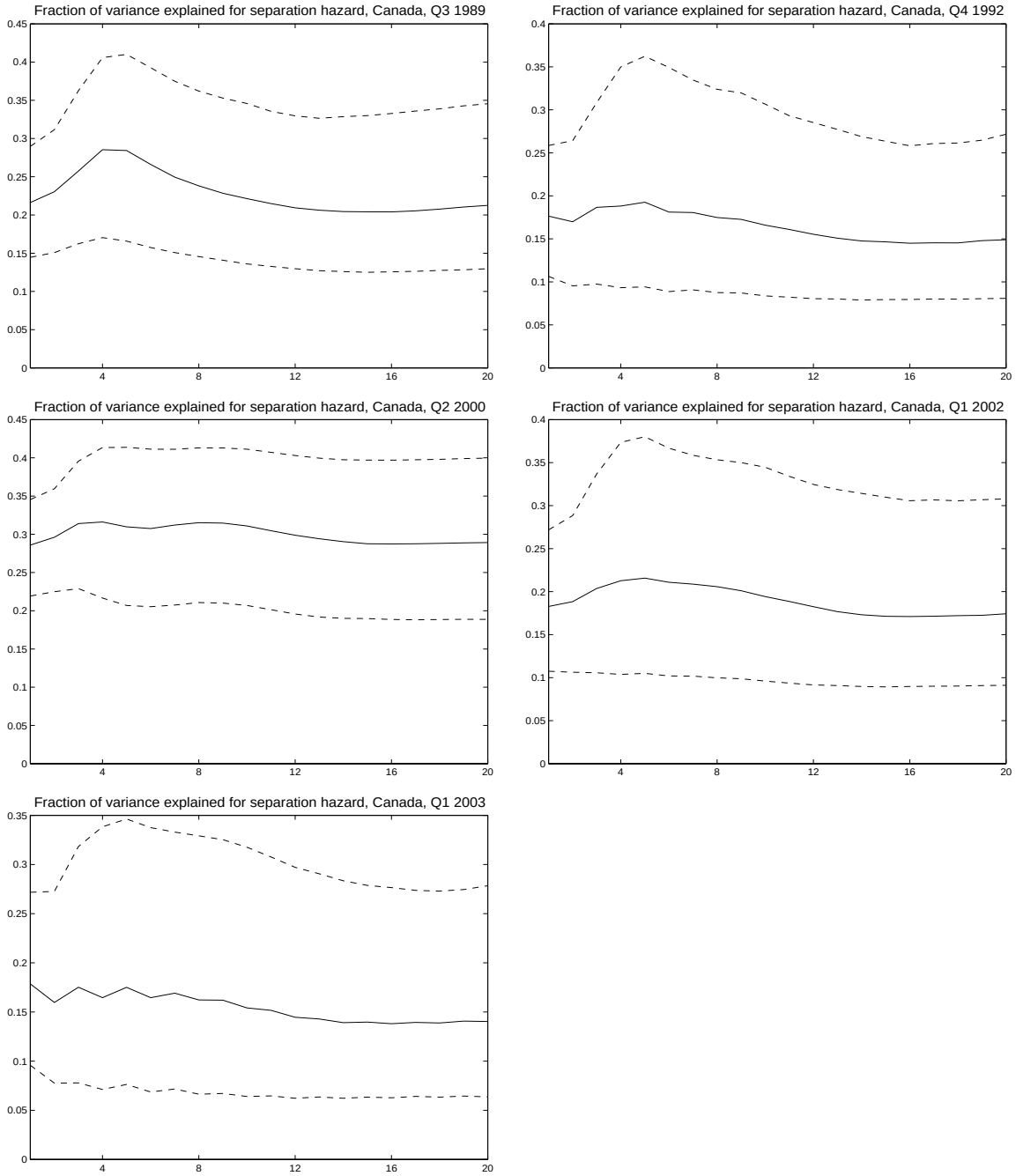


Figure A. 94. Variance decomposition for separation hazards -*Homo TVP-VAR*, Canada

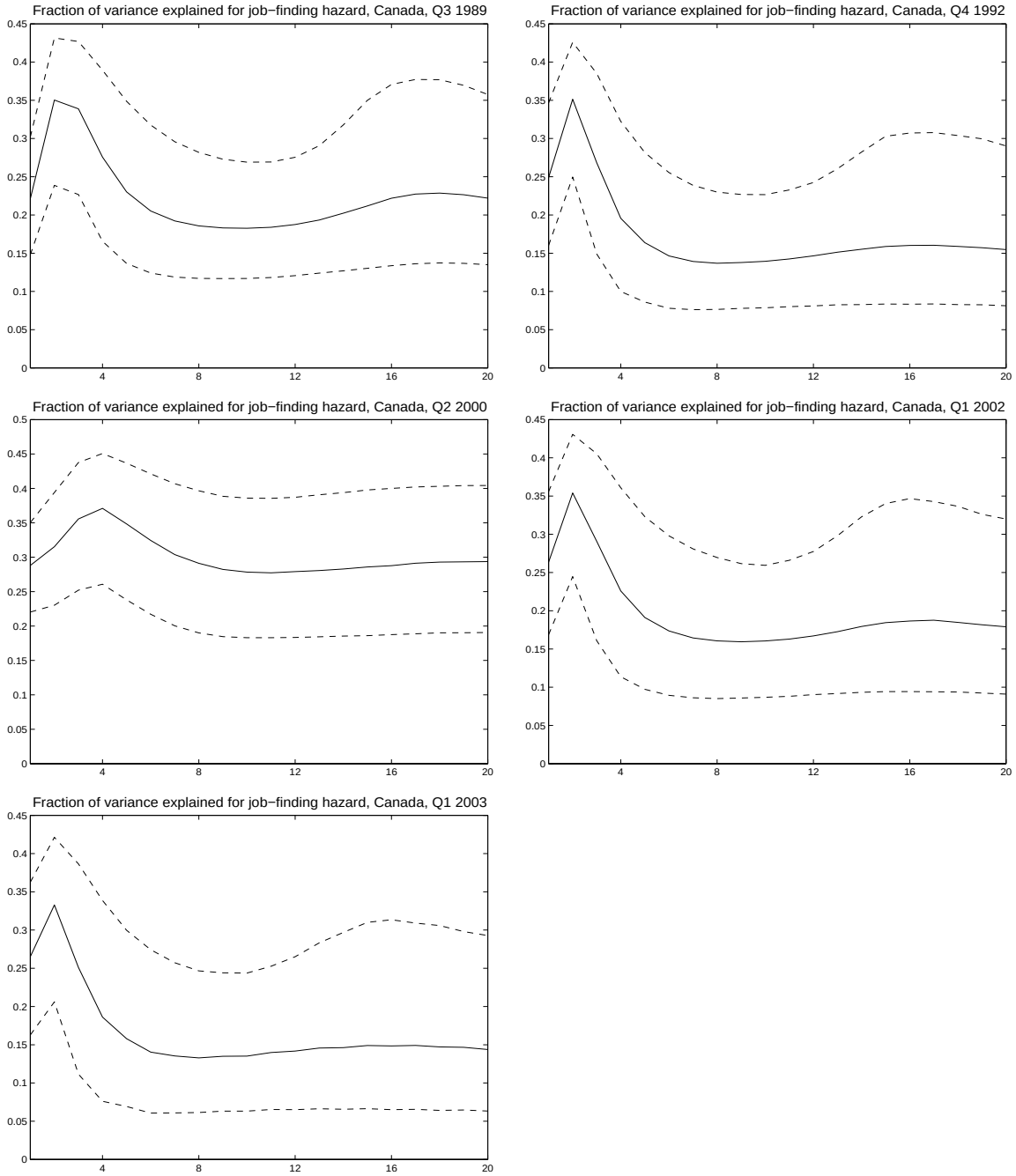


Figure A. 95. Variance decomposition for job-finding hazards -*Homo TVP-VAR*, Canada

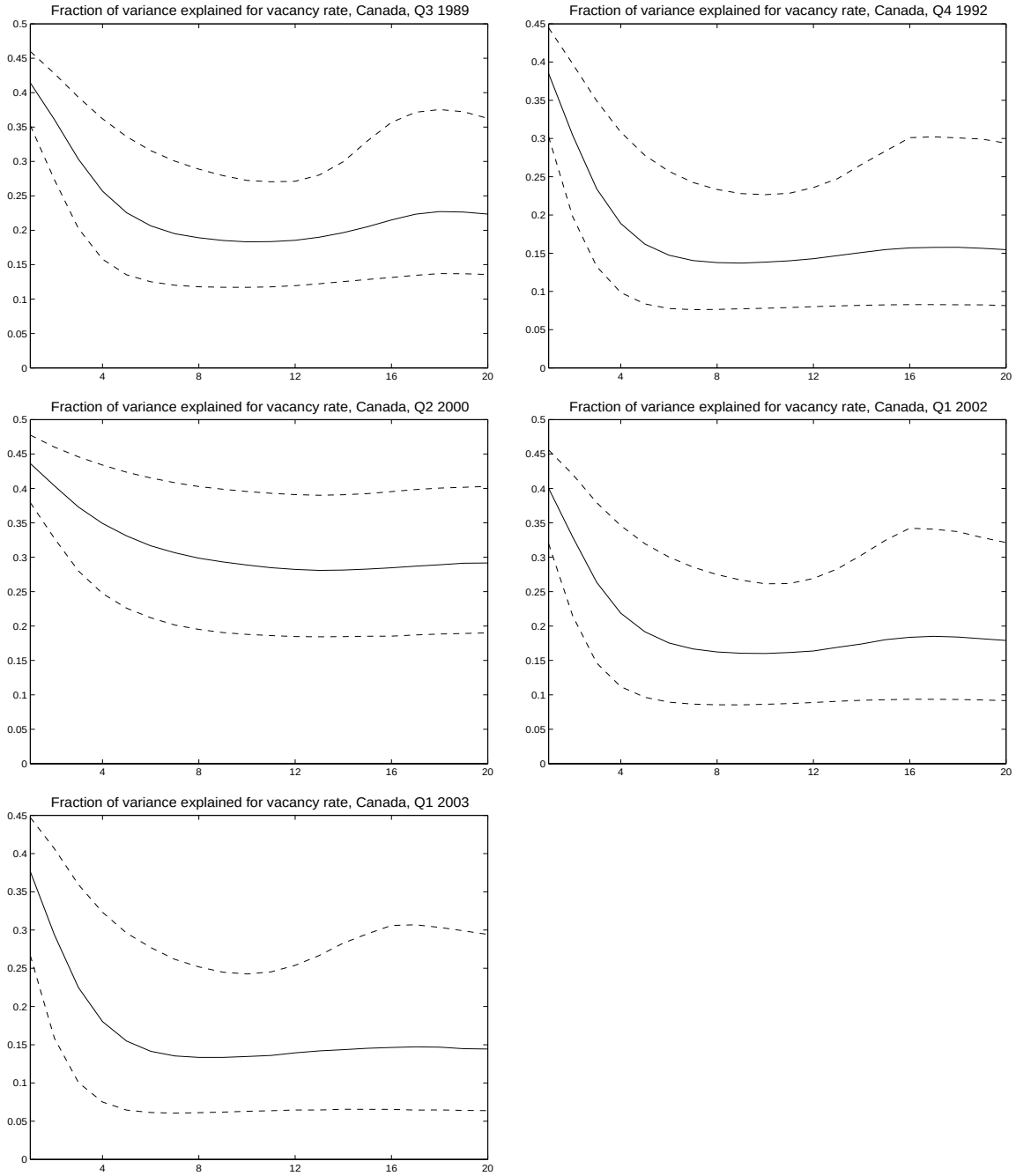


Figure A. 96. Variance decomposition for vacancies -*Homo TVP-VAR*, Canada

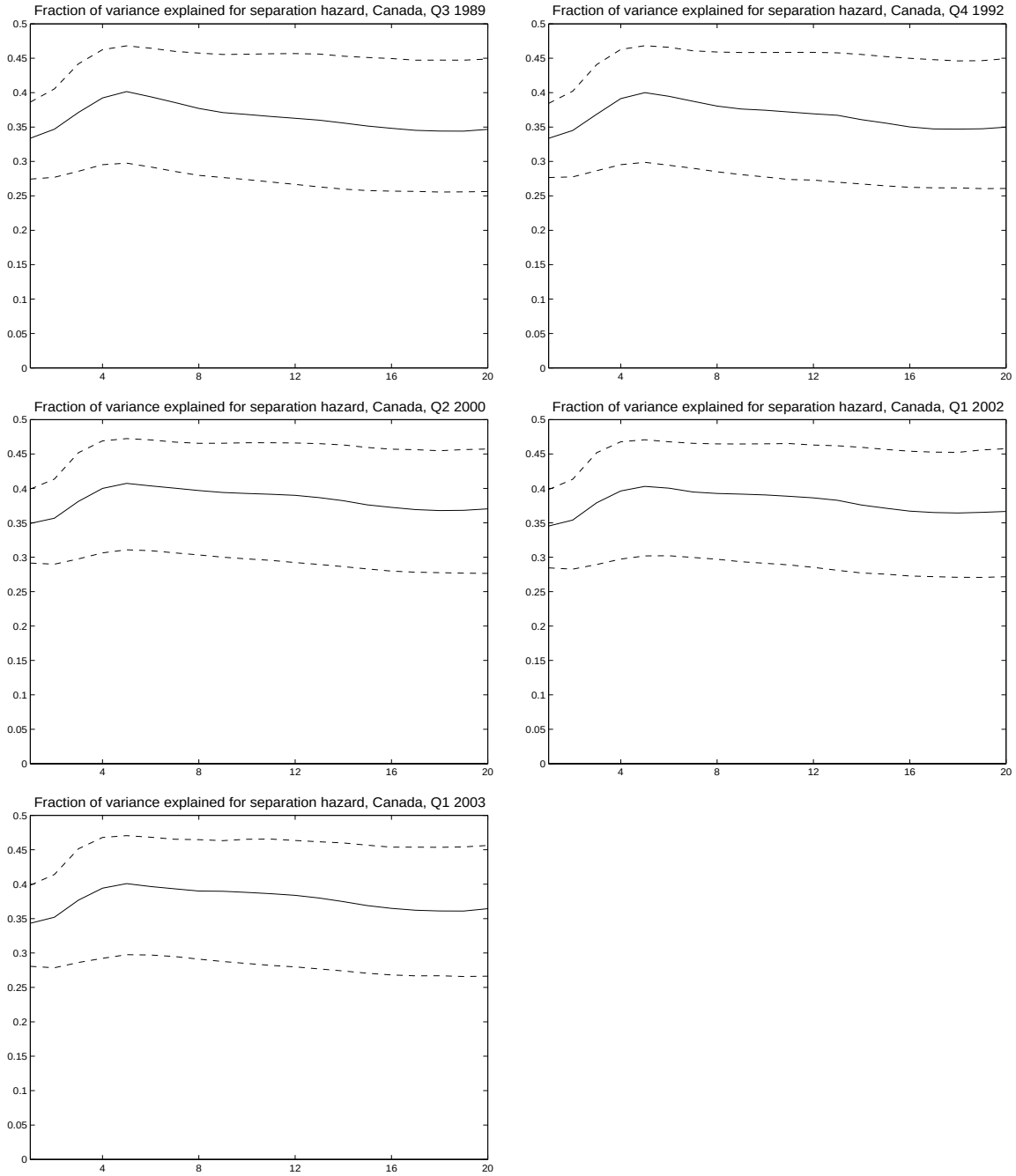


Figure A. 97. Variance decomposition for separation hazards -*Hete TVP-VAR*, Canada

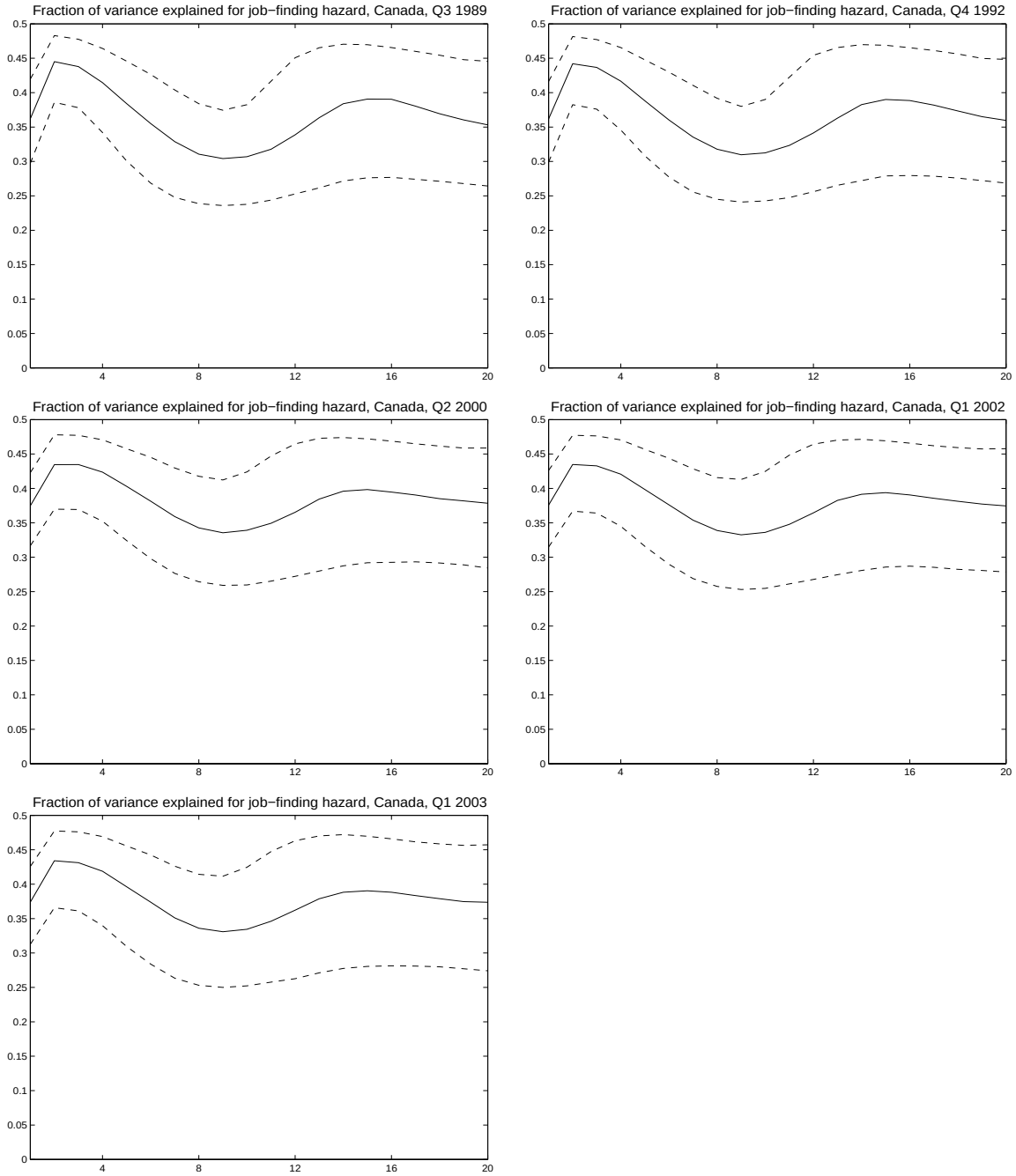


Figure A. 98. Variance decomposition for job-finding hazards -*Hete TVP-VAR*, Canada

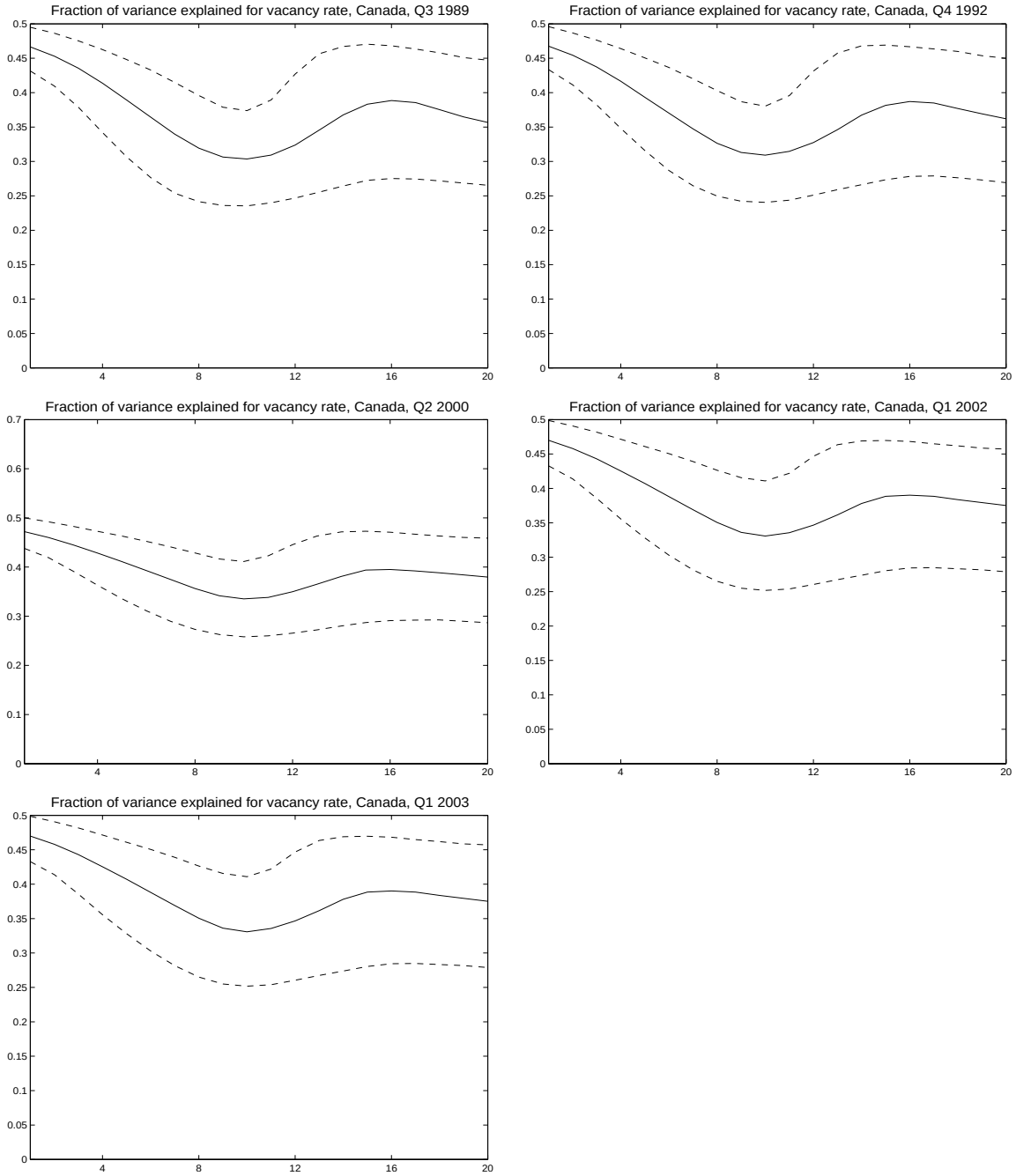


Figure A. 99. Variance decomposition for vacancies -*Hete TVP-VAR*, Canada

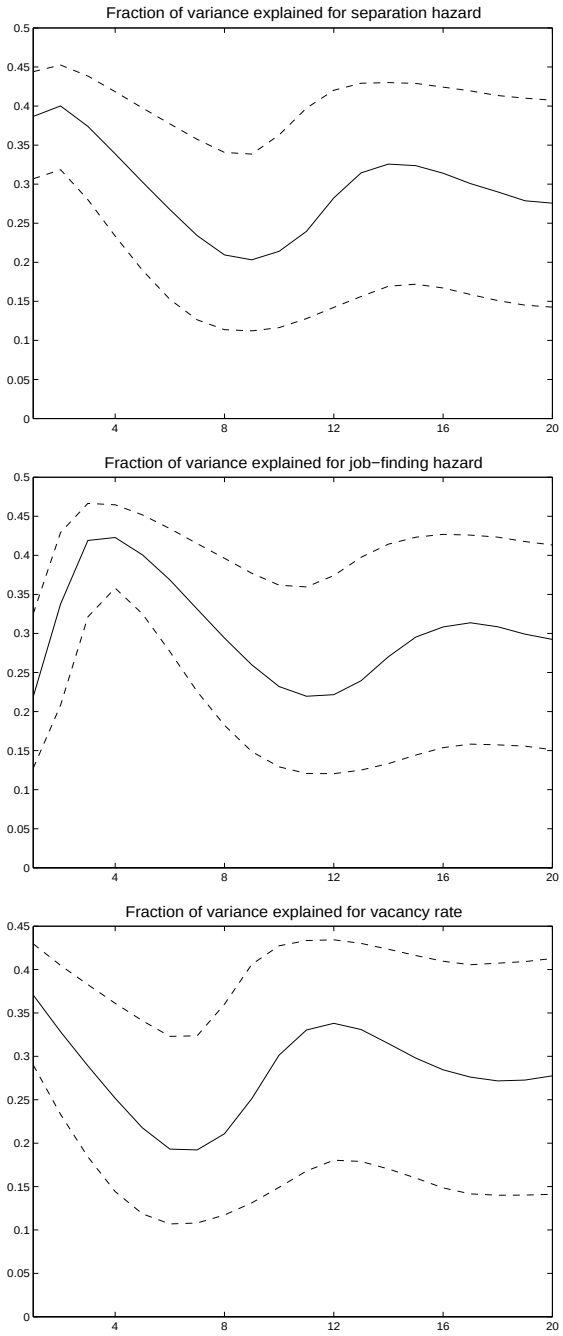


Figure A. 100. Variance decompositions - VAR, France

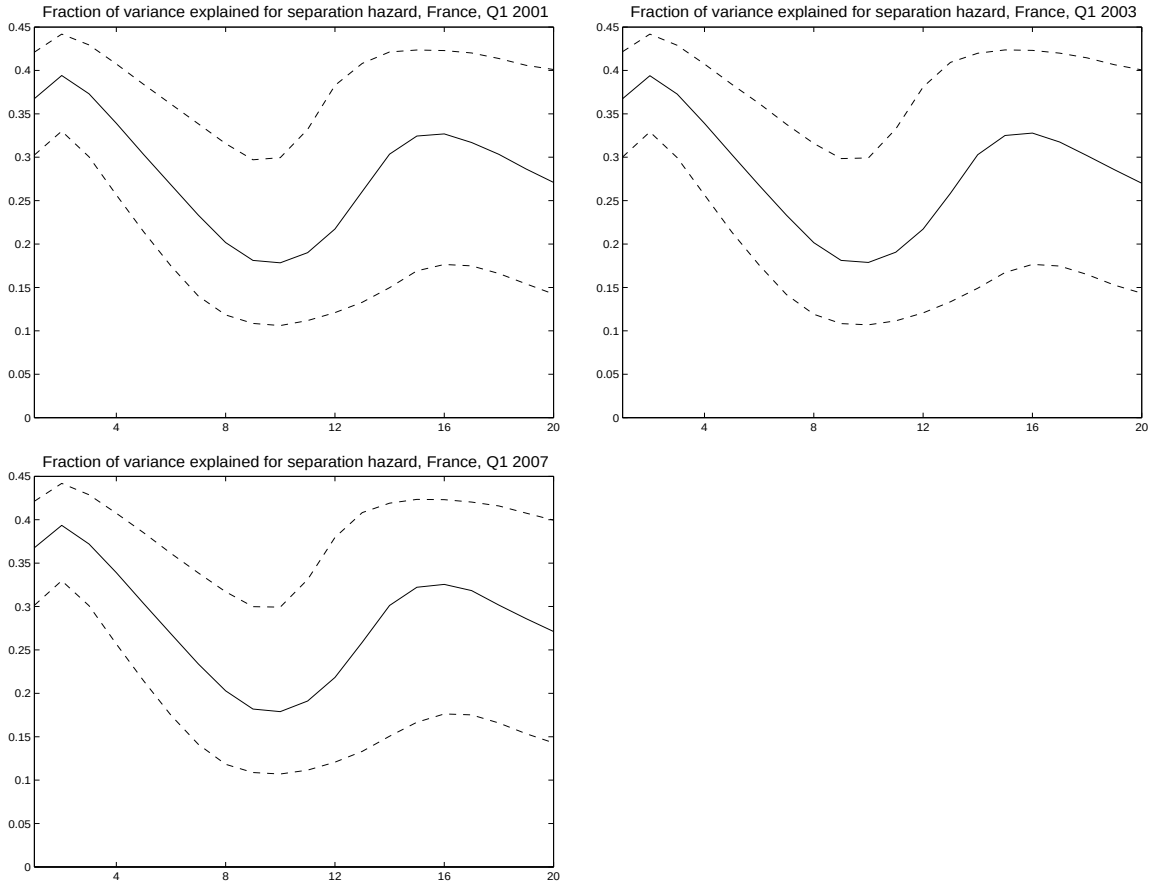


Figure A. 101. Variance decomposition for separation hazards -*Homo TVP-VAR*, France

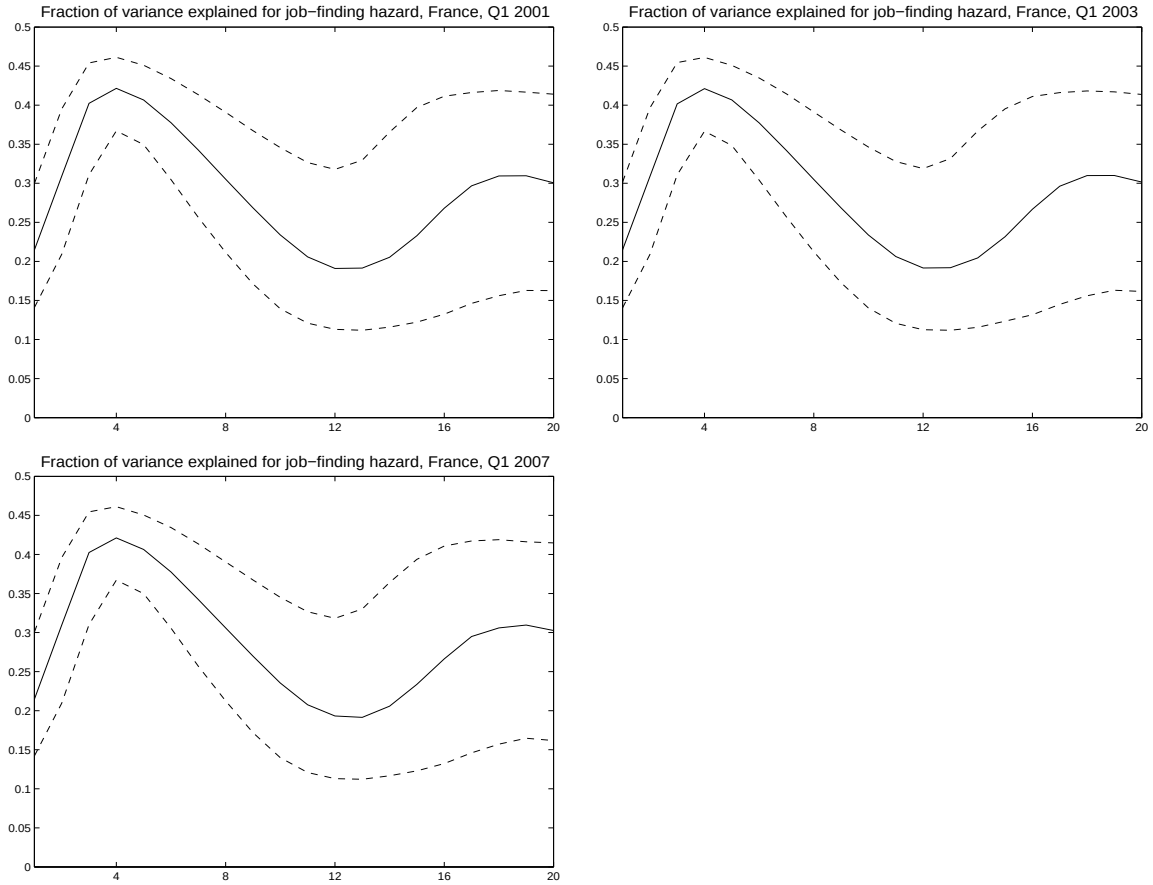


Figure A. 102. Variance decomposition for job-finding hazards -*Homo TVP-VAR*, France

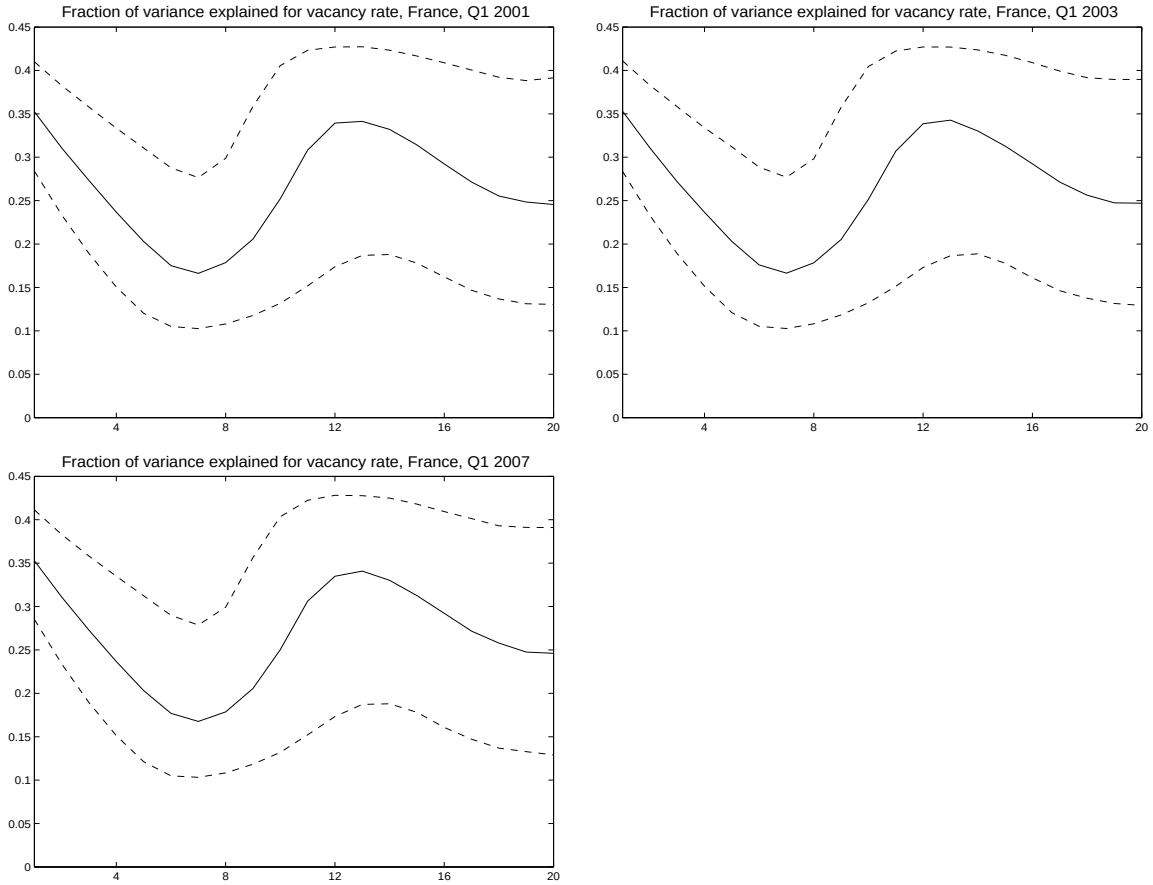


Figure A. 103. Variance decomposition for vacancies -*Homo TVP-VAR*, France

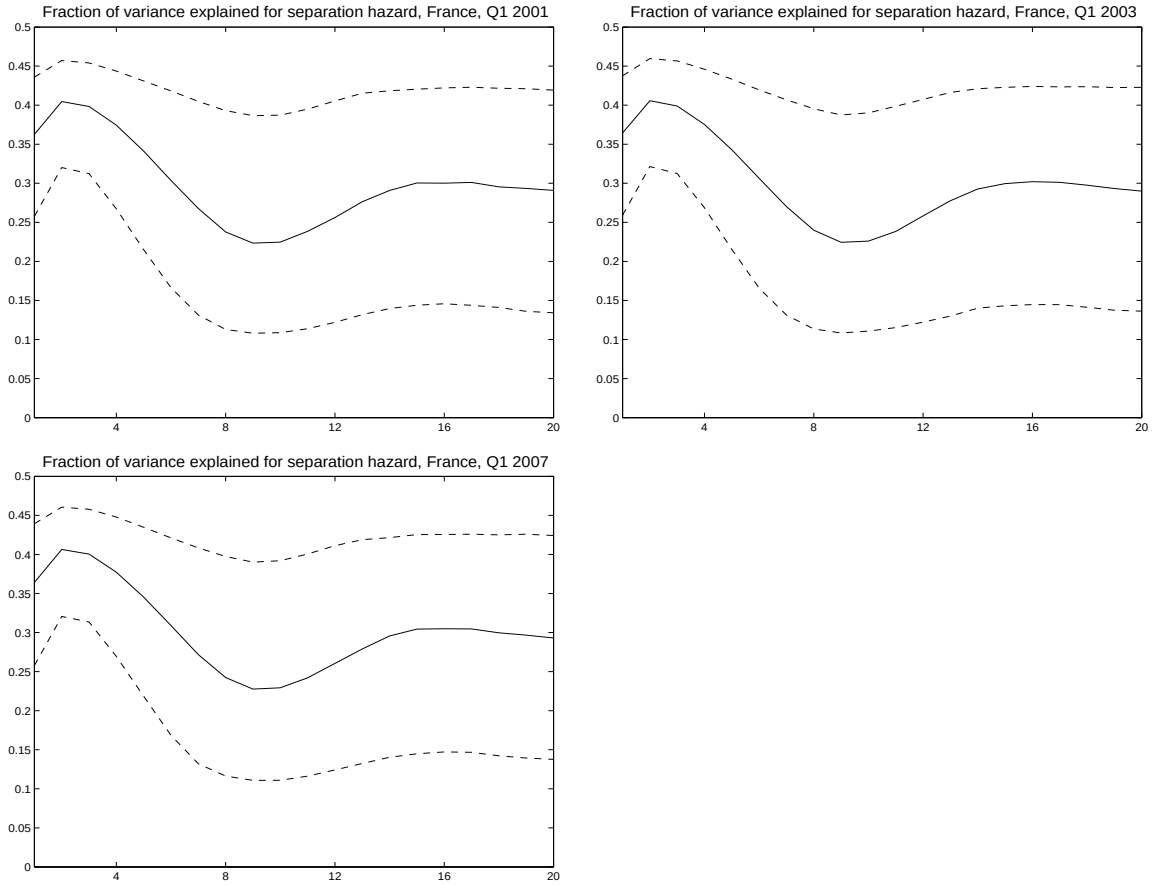


Figure A. 104. Variance decomposition for separation hazards -*Hete TVP-VAR*, France

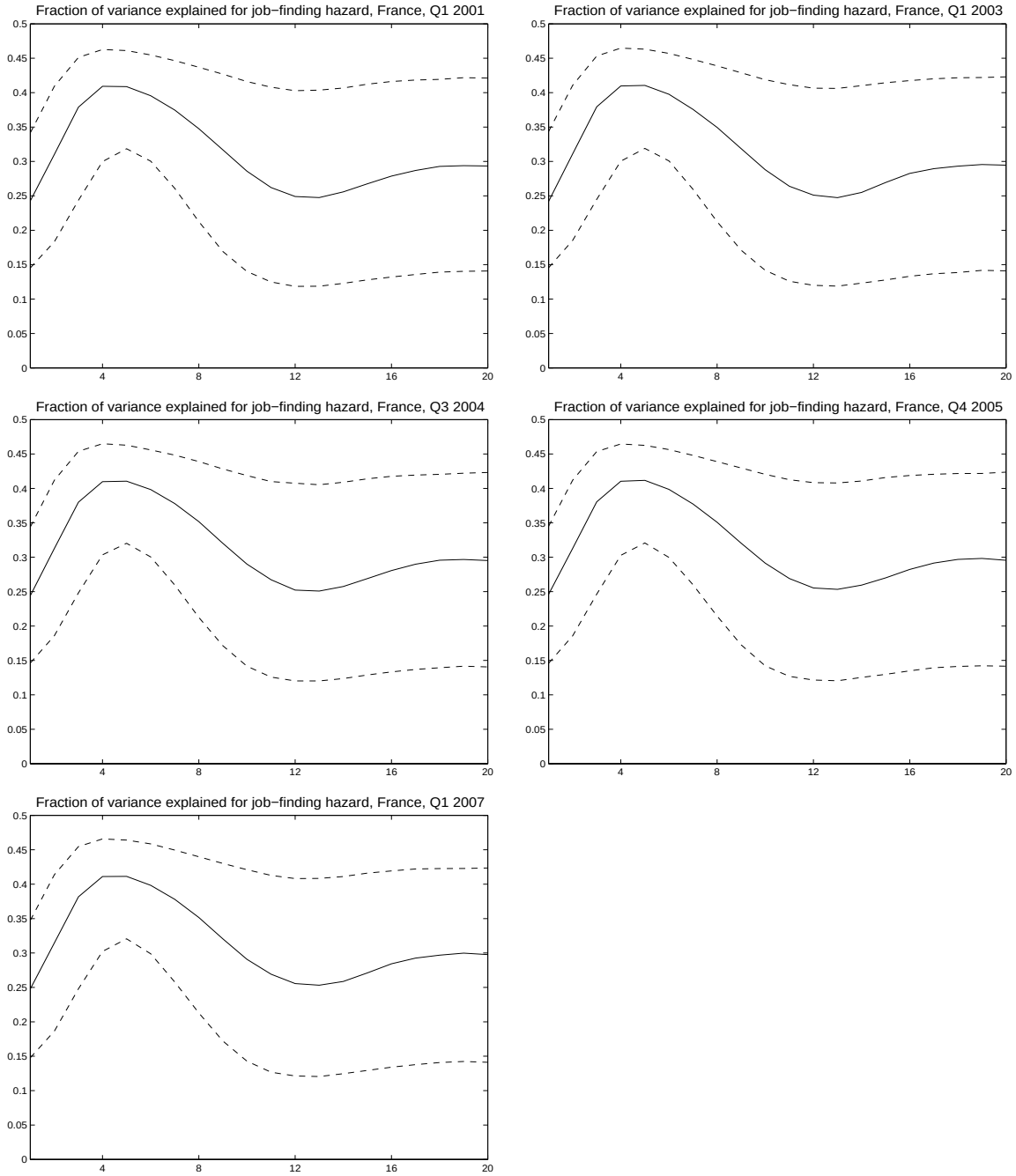


Figure A. 105. Variance decomposition for job-finding hazards -*Hete TVP-VAR*, France

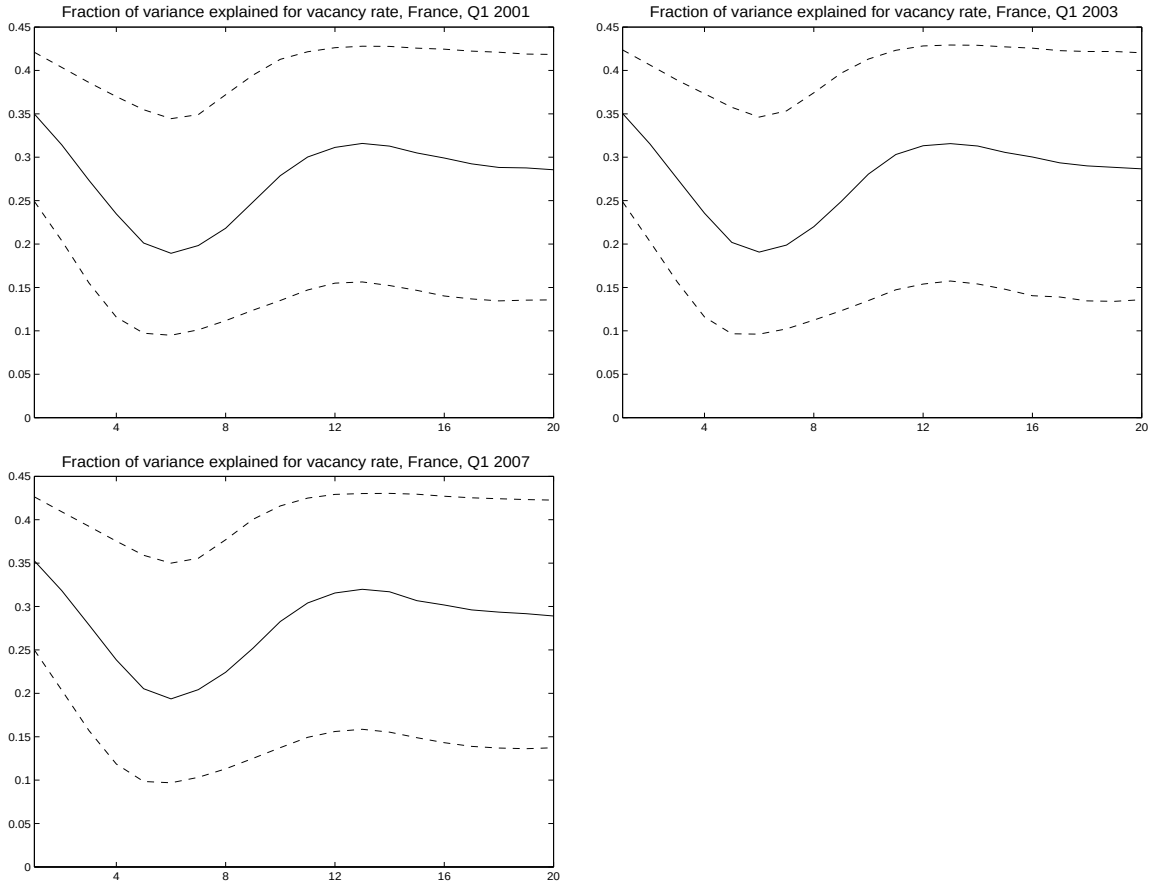


Figure A. 106. Variance decomposition for vacancies -*Hete TVP-VAR*, France

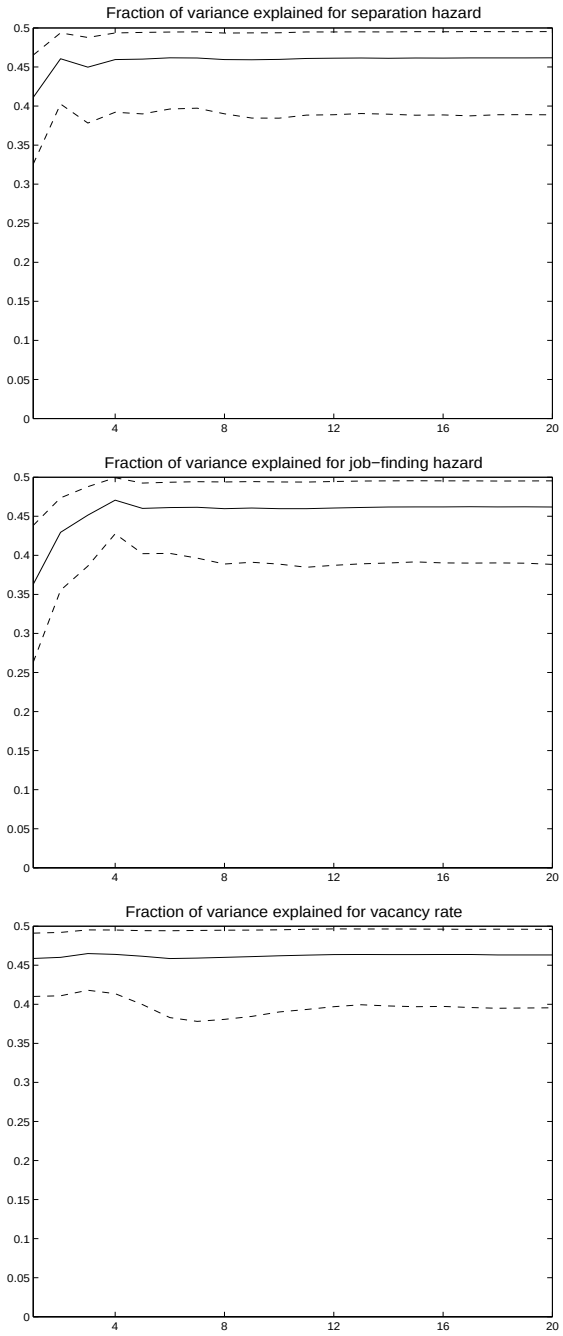


Figure A. 107. Variance decompositions - VAR, Spain

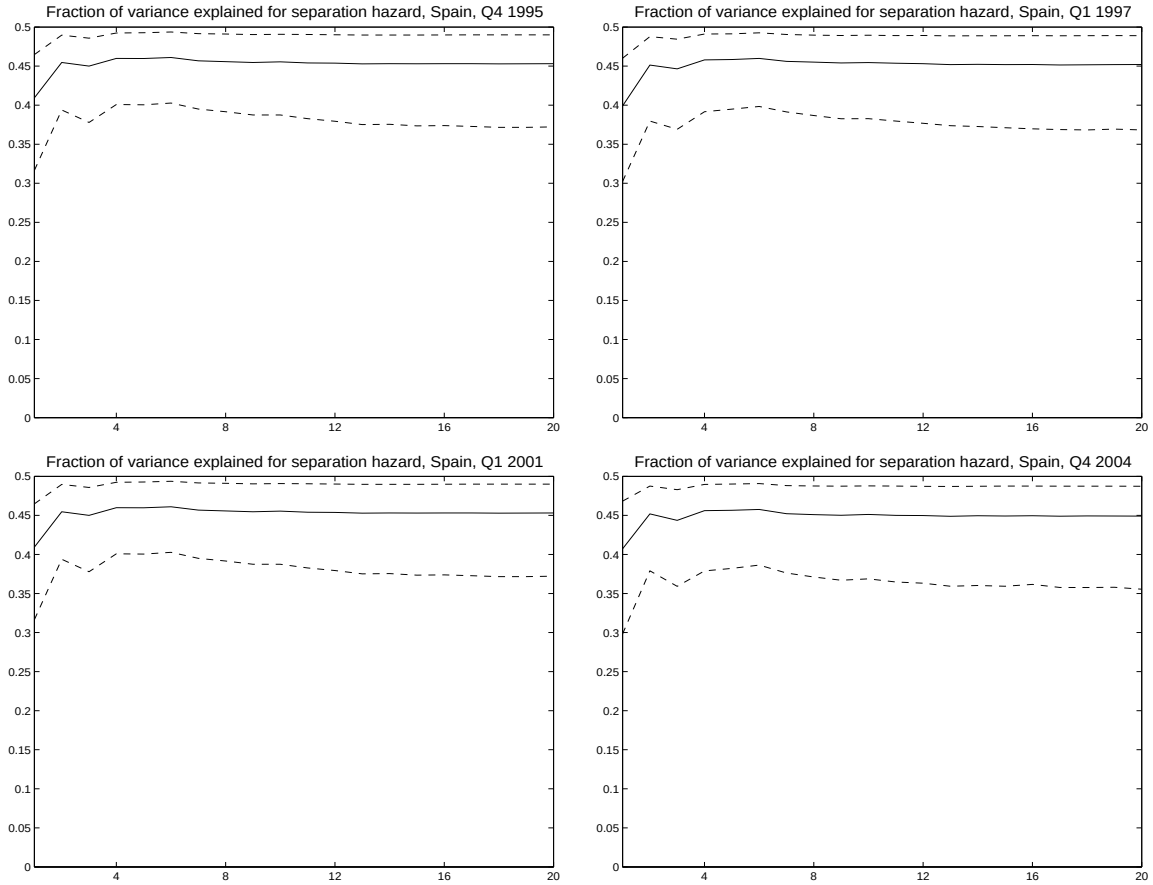


Figure A. 108. Variance decomposition for separation hazards -*Homo TVP-VAR*, Spain

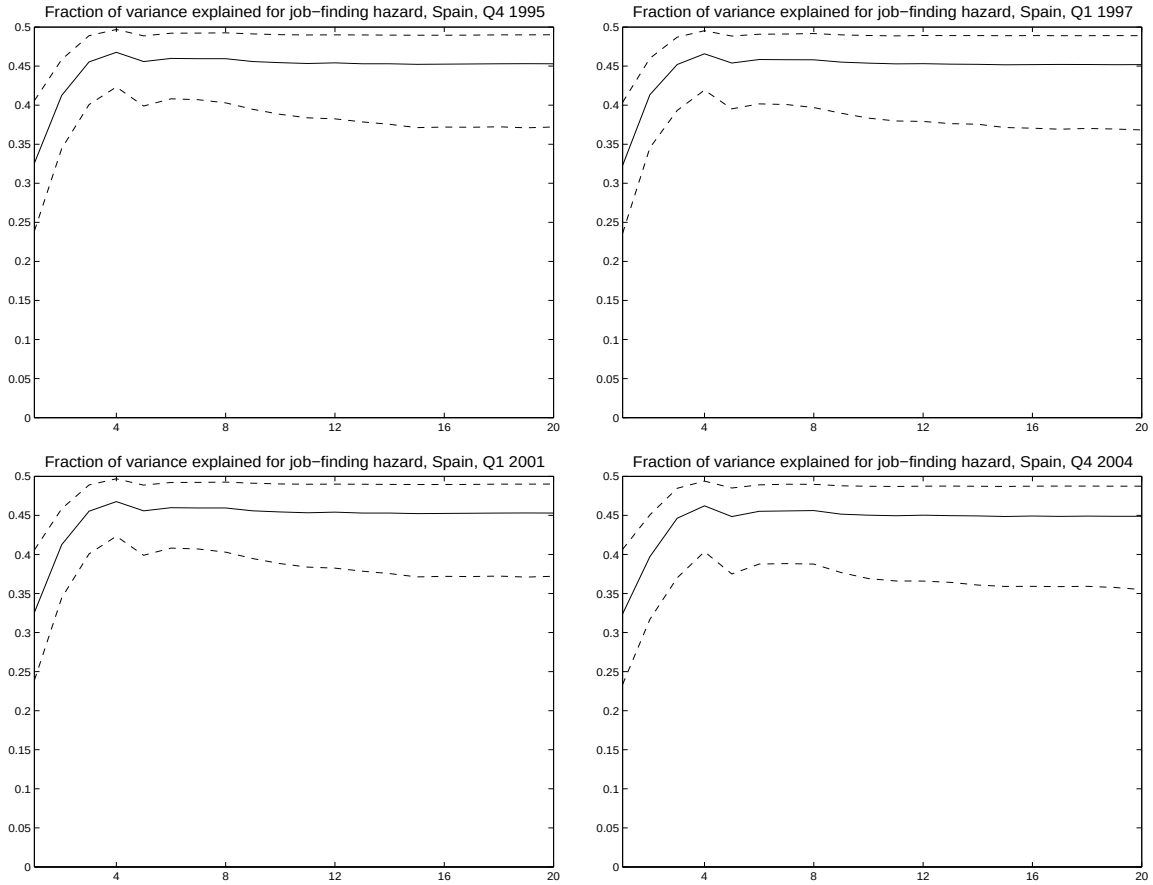


Figure A. 109. Variance decomposition for job-finding hazards -*Homo TVP-VAR*, Spain

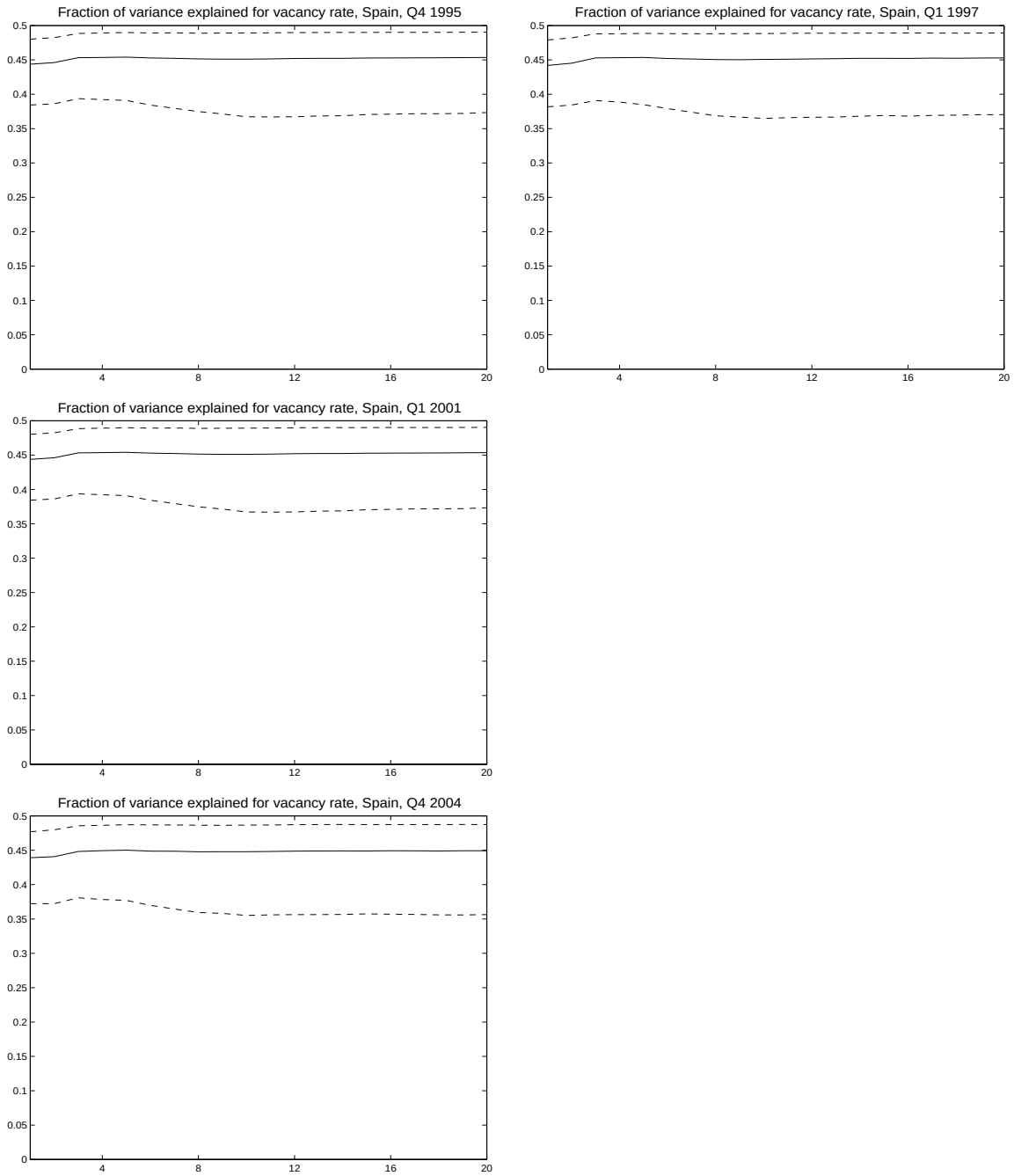


Figure A. 110. Variance decomposition for vacancies -*Homo TVP-VAR*, Spain

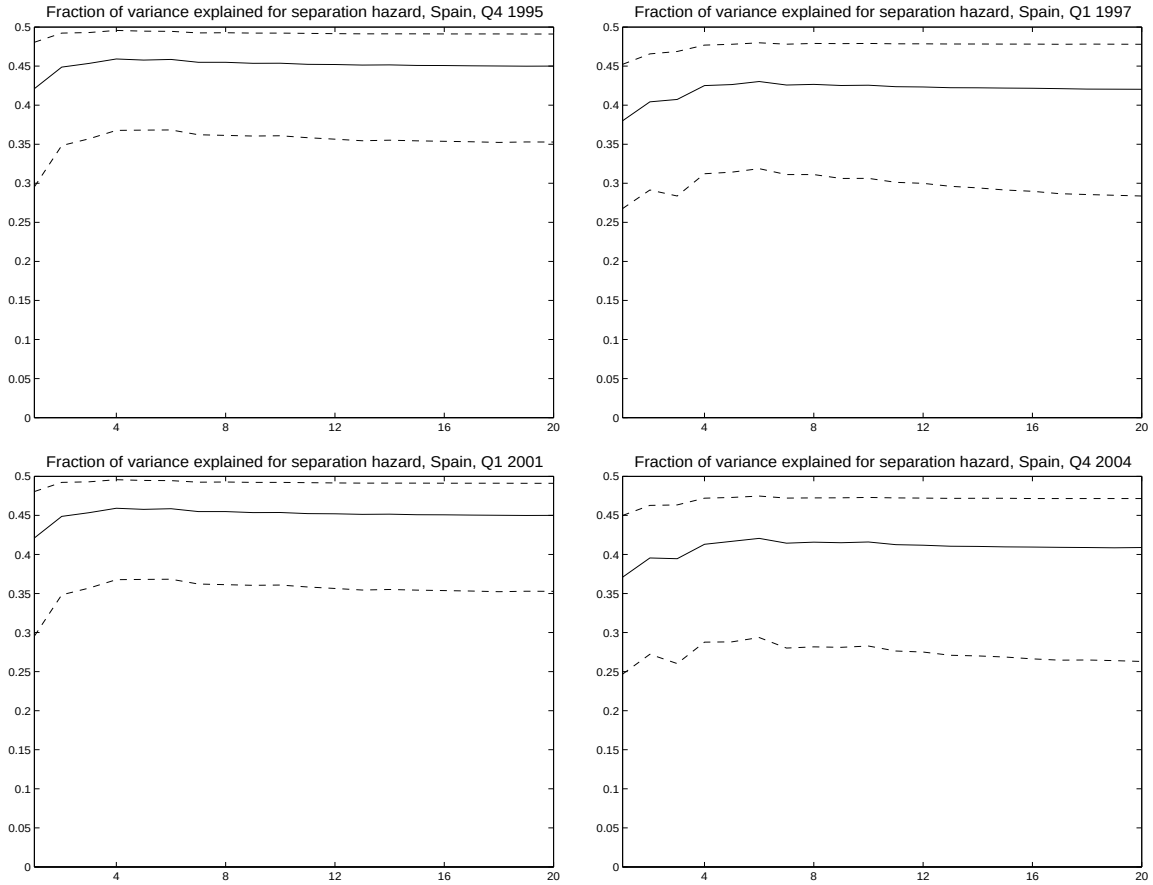


Figure A. 111. Variance decomposition for separation hazards -*Hete TVP-VAR*, Spain

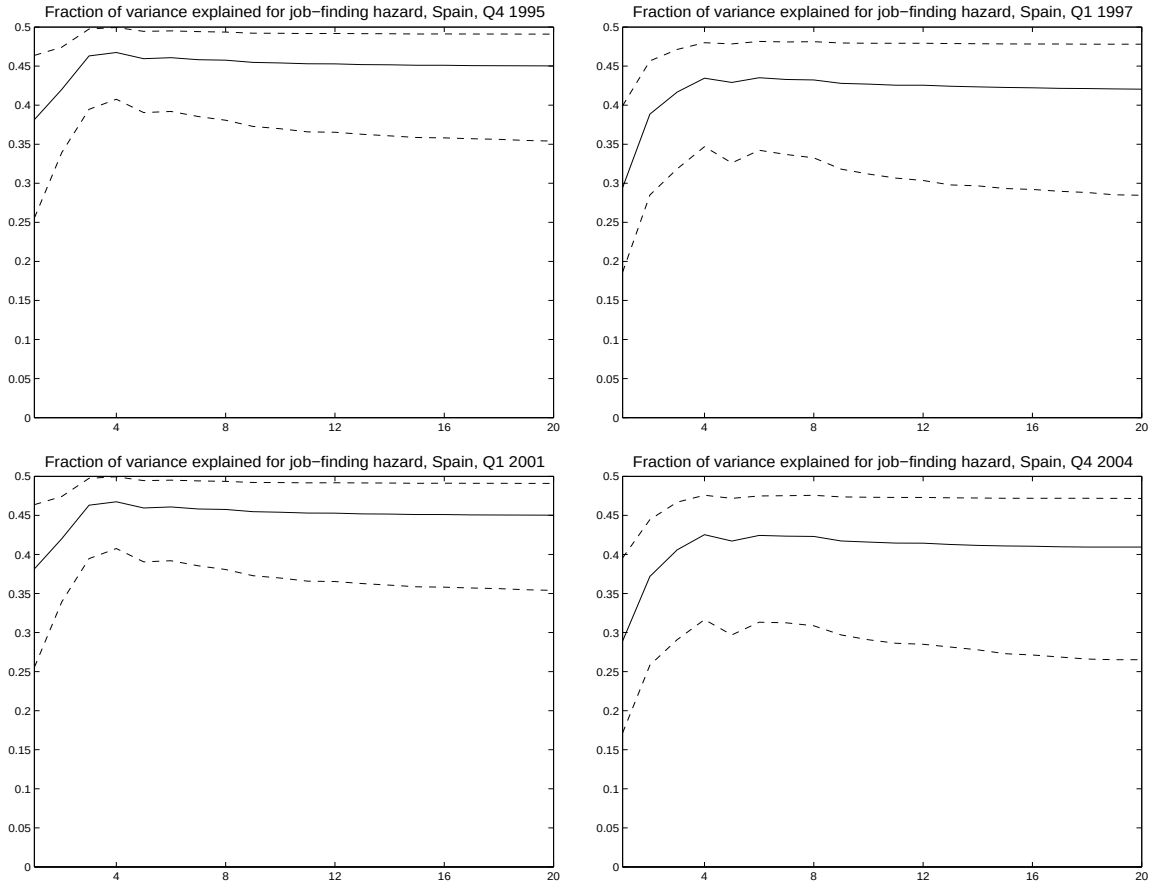


Figure A. 112. Variance decomposition for job-finding hazards -*Hete TVP-VAR*, Spain

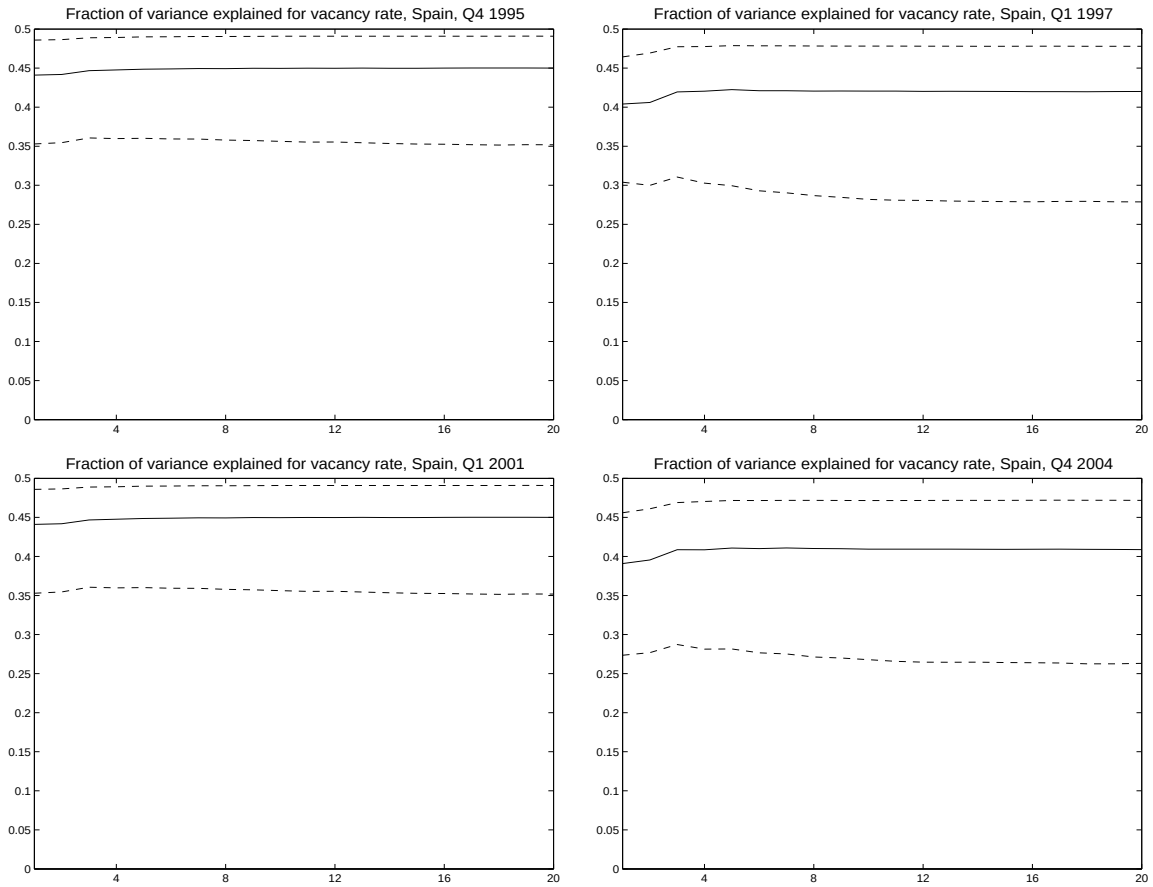


Figure A. 113. Variance decomposition for vacancies -*Hete TVP-VAR*, Spain

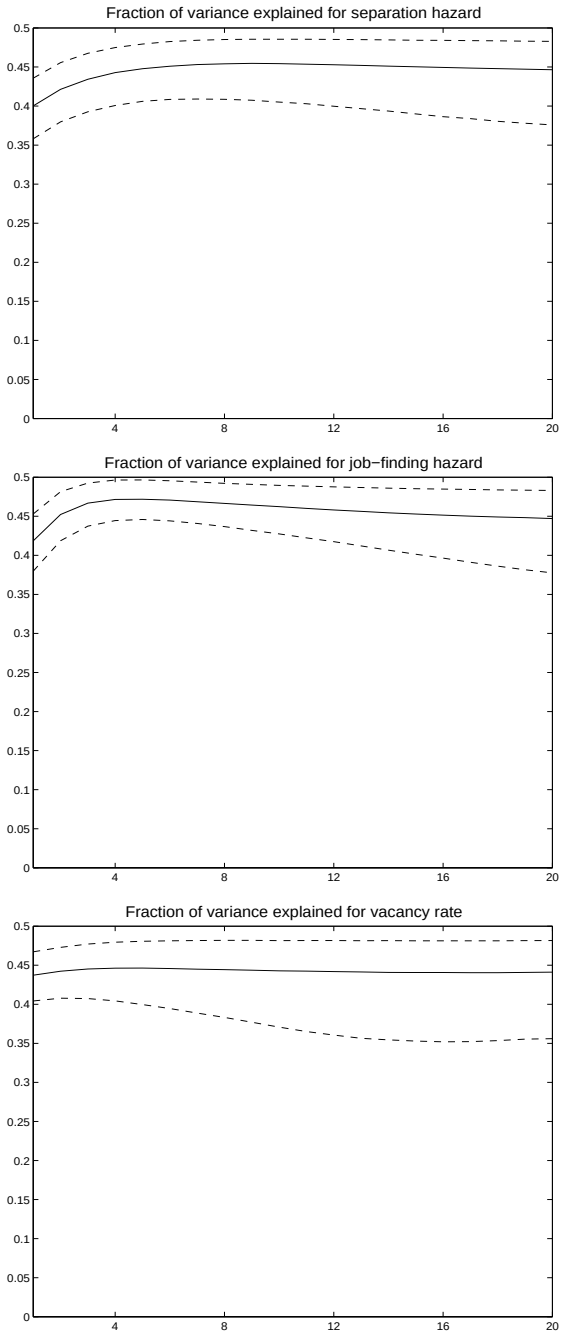


Figure A. 114. Variance decompositions - VAR, UK

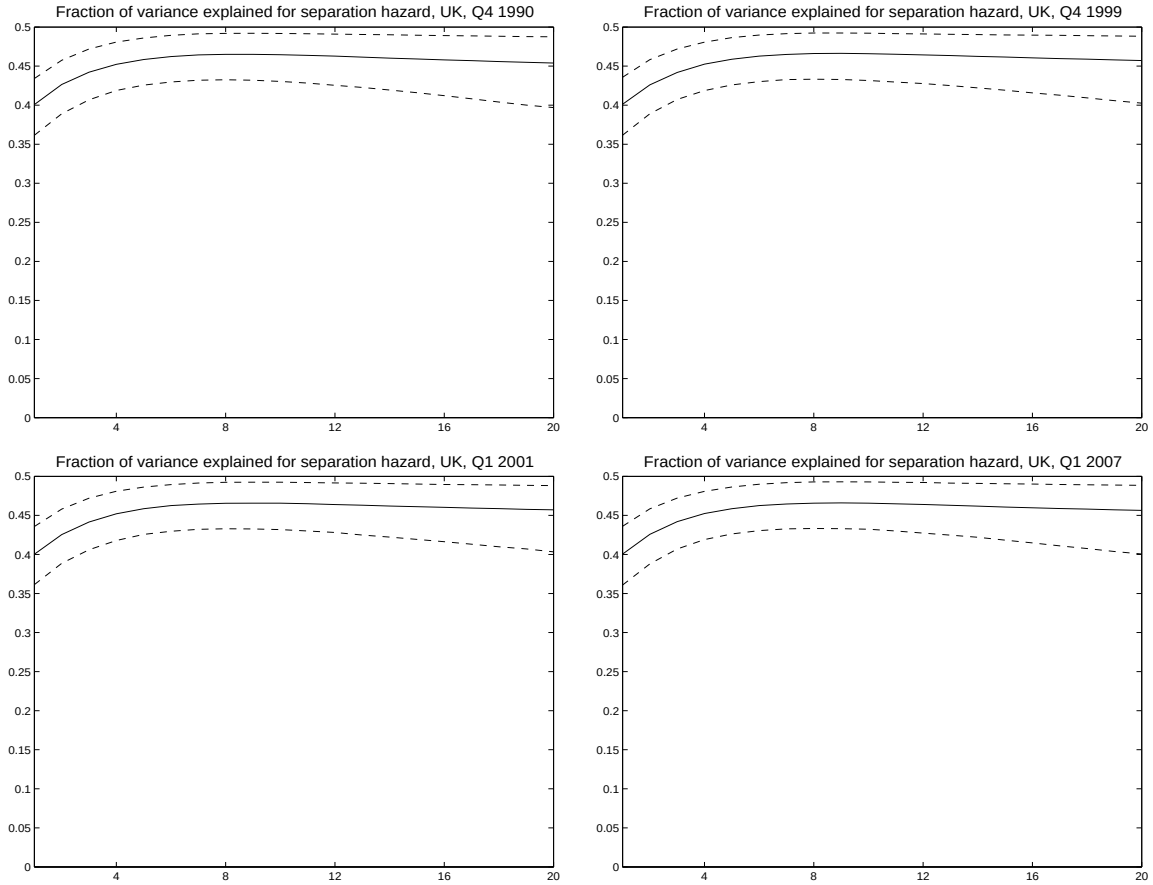


Figure A. 115. Variance decomposition for separation hazards -*Homo TVP-VAR*, UK

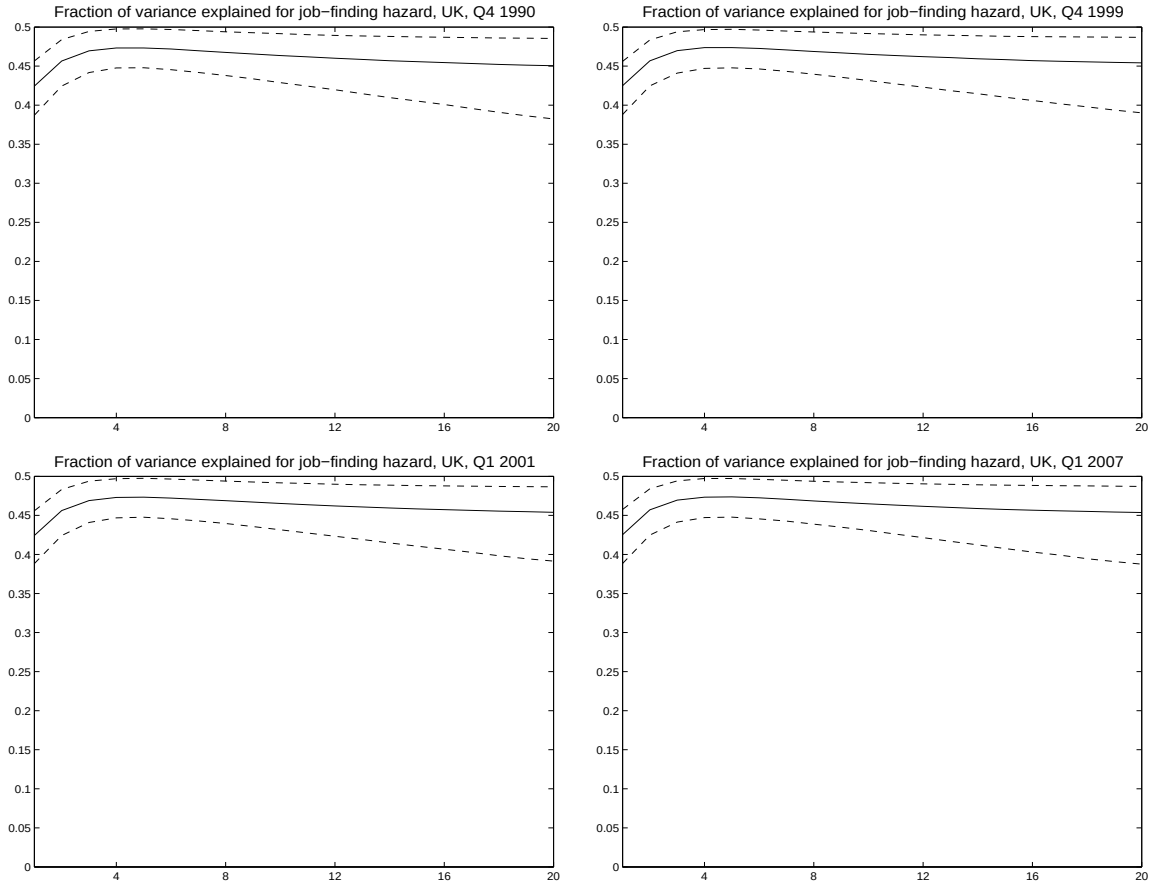


Figure A. 116. Variance decomposition for job-finding hazards -*Homo TVP-VAR*, UK

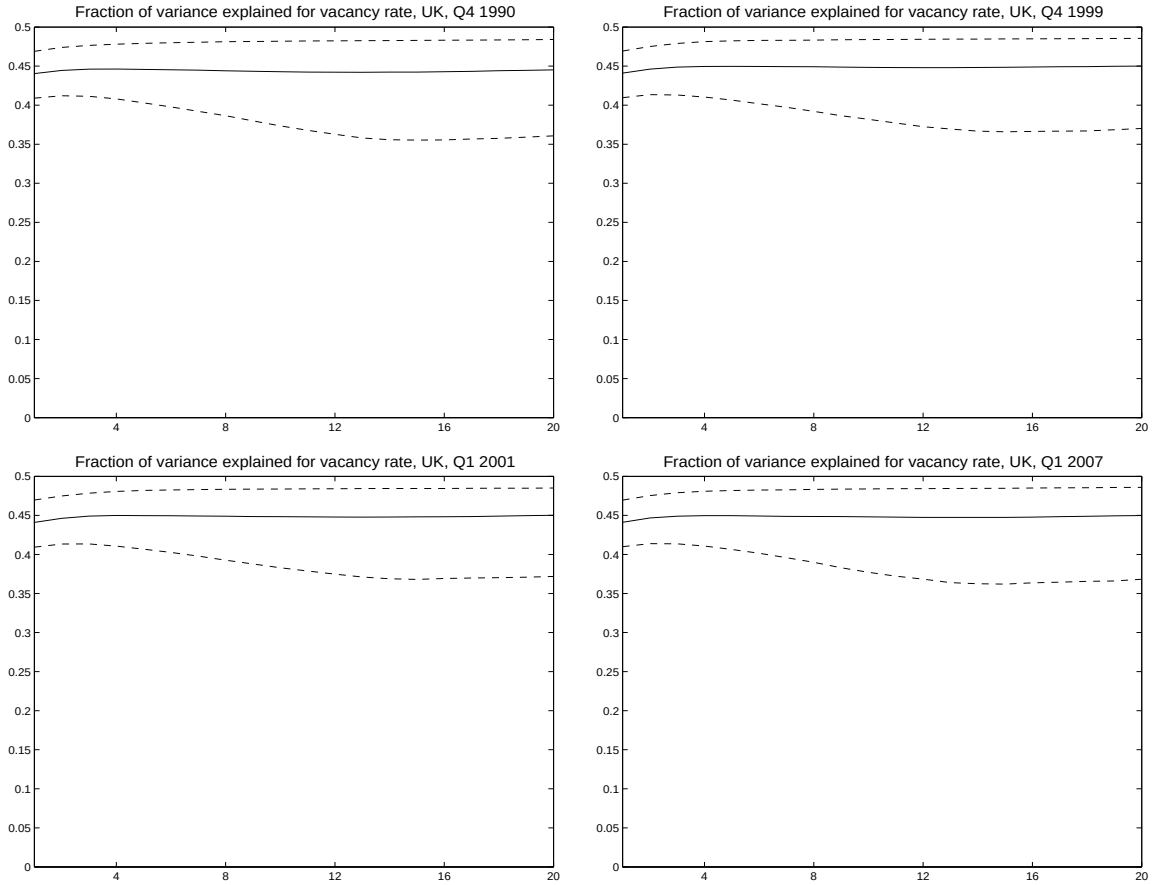


Figure A. 117. Variance decomposition for vacancies -*Homo TVP-VAR*, UK

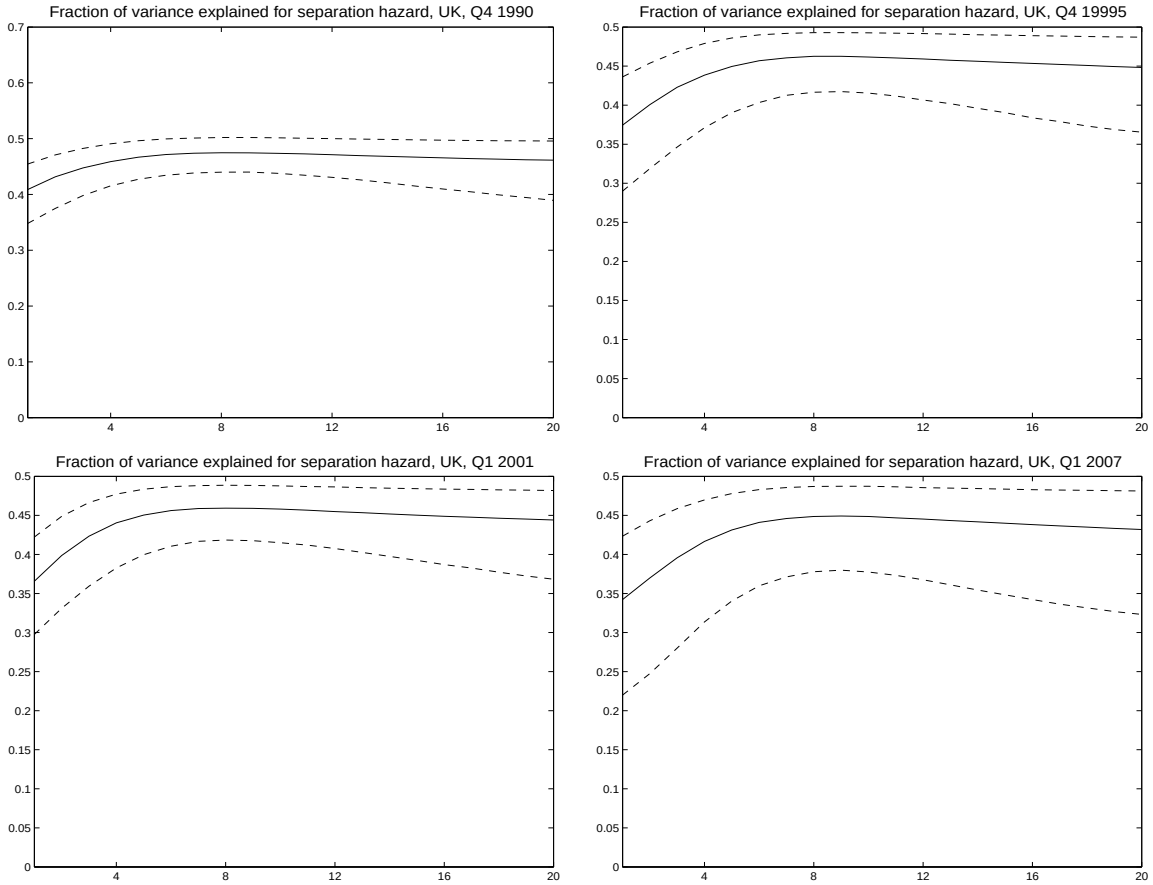


Figure A. 118. Variance decomposition for separation hazards -*Hete TVP-VAR*, UK

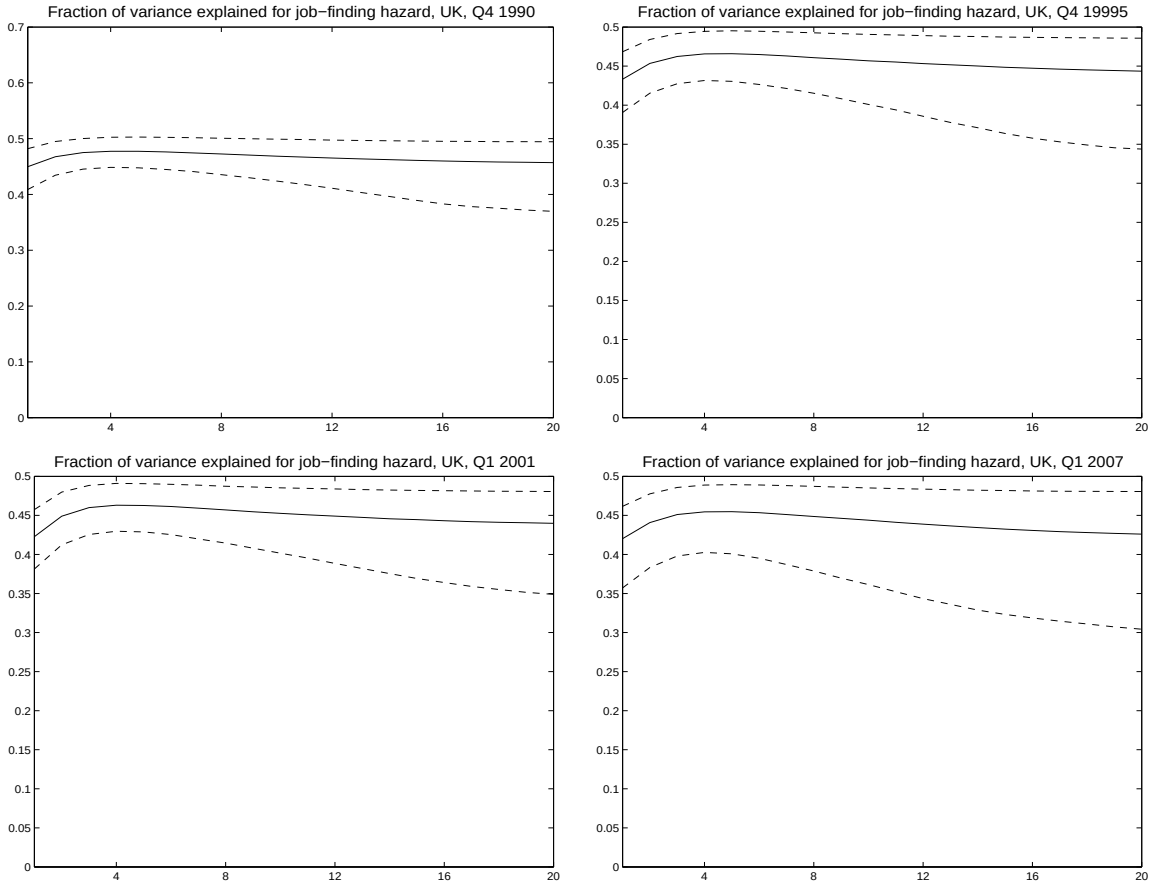


Figure A. 119. Variance decomposition for job-finding hazards -*Hete TVP-VAR*, UK

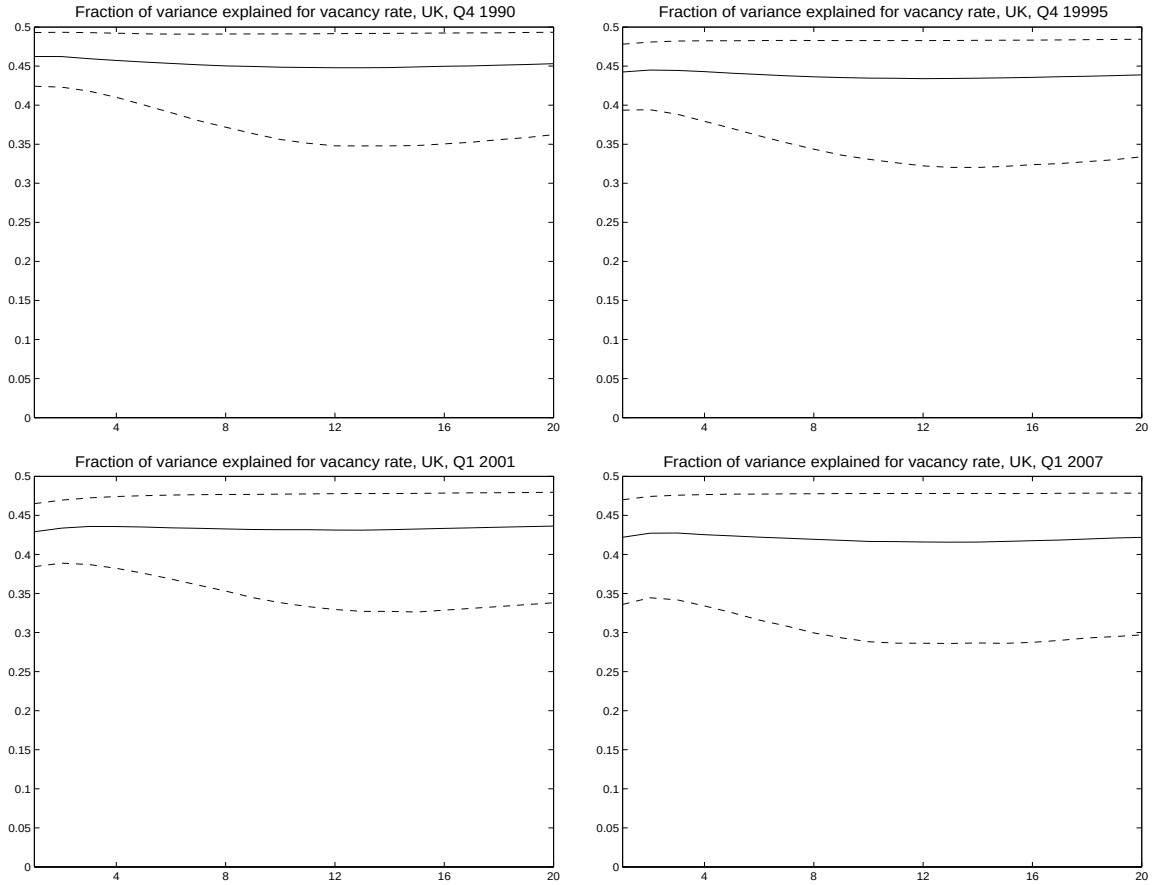


Figure A. 120. Variance decomposition for vacancies -*Hete TVP-VAR*, UK

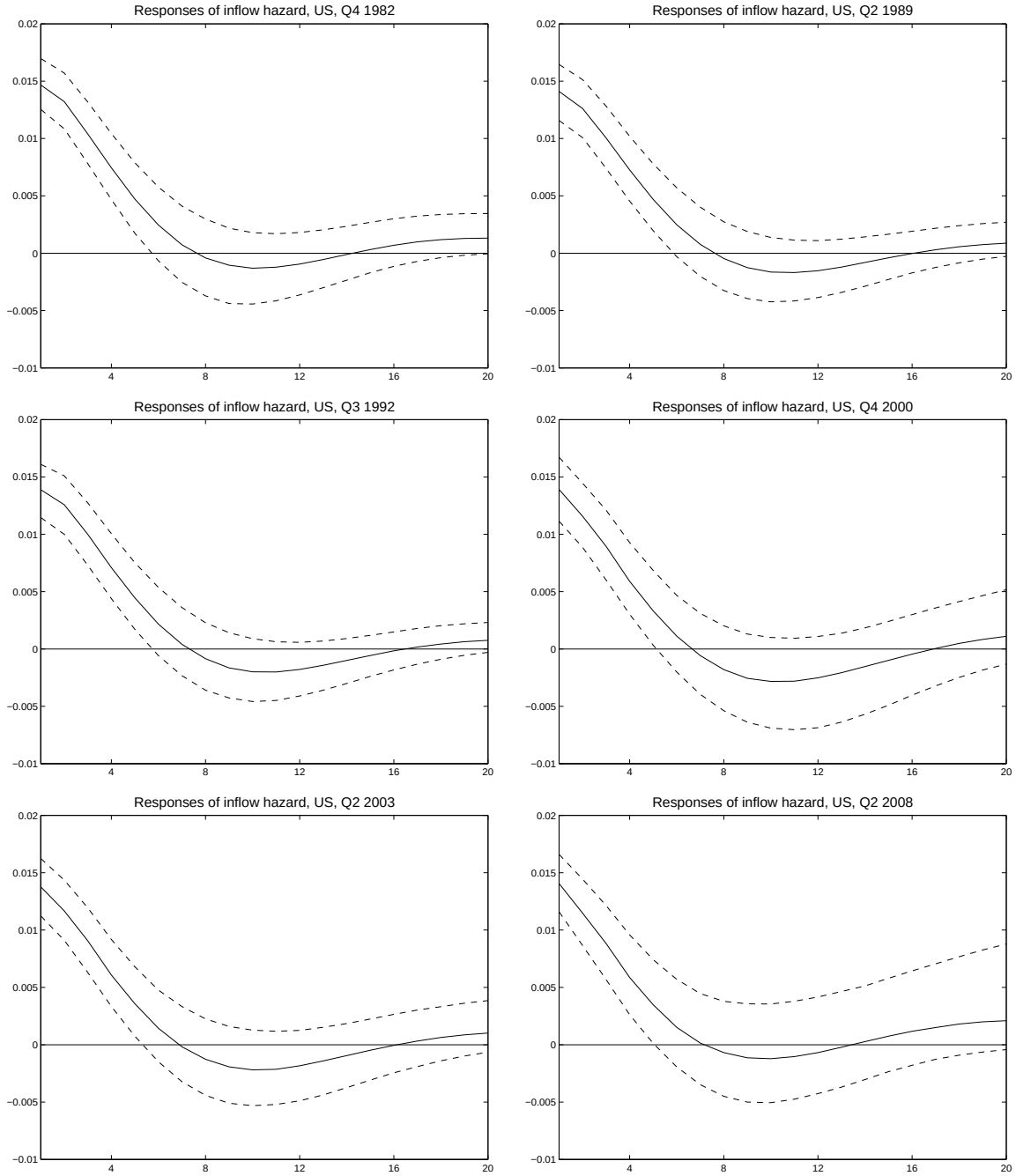


Figure B. 1. Impulse responses of separation hazards -*Homo TVP-VAR*, US

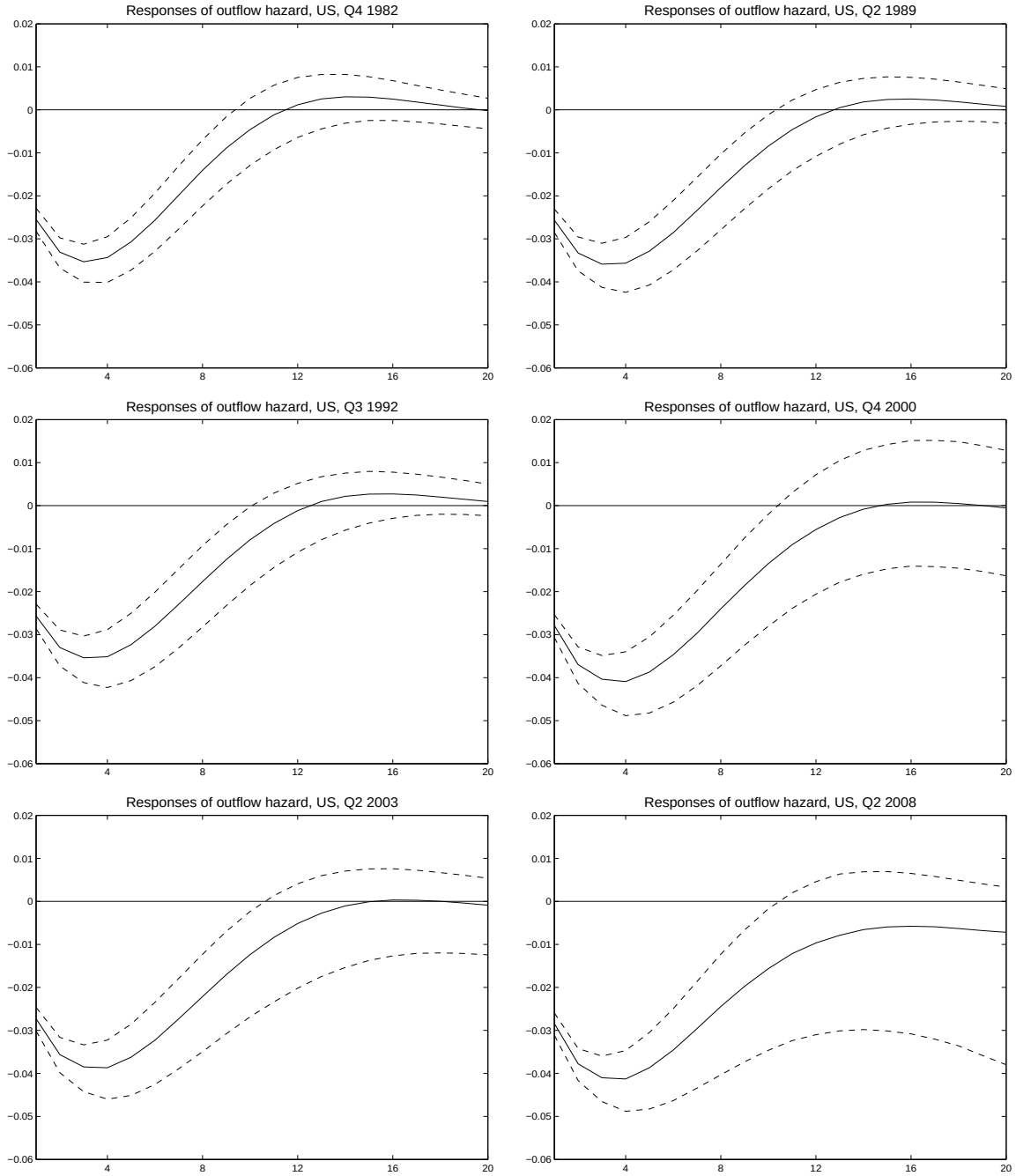


Figure B. 2. Impulse responses of job-finding hazards -*Homo TVP-VAR*, US

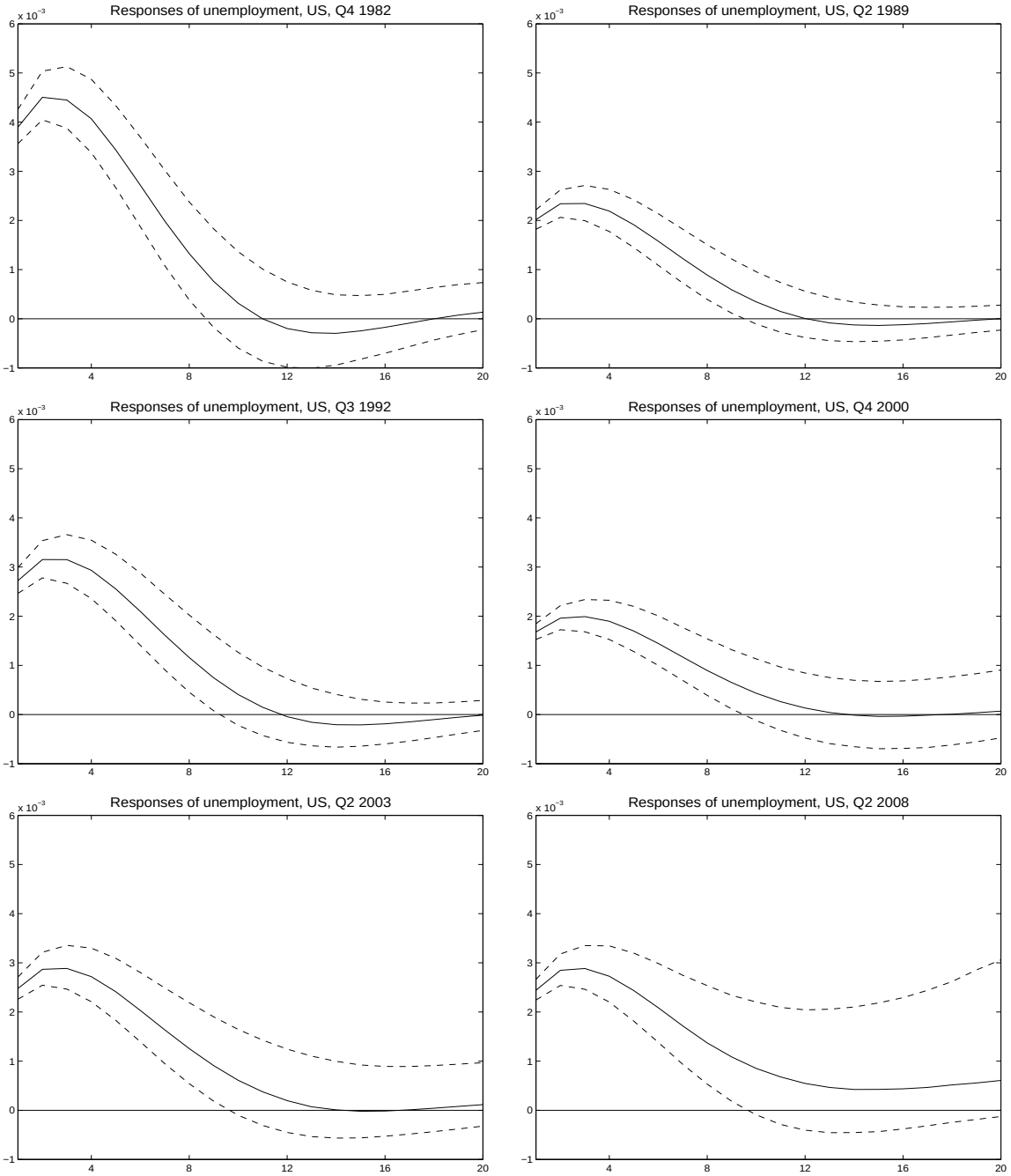


Figure B. 3. Impulse responses of unemployment rates -*Homo TVP-VAR*, US

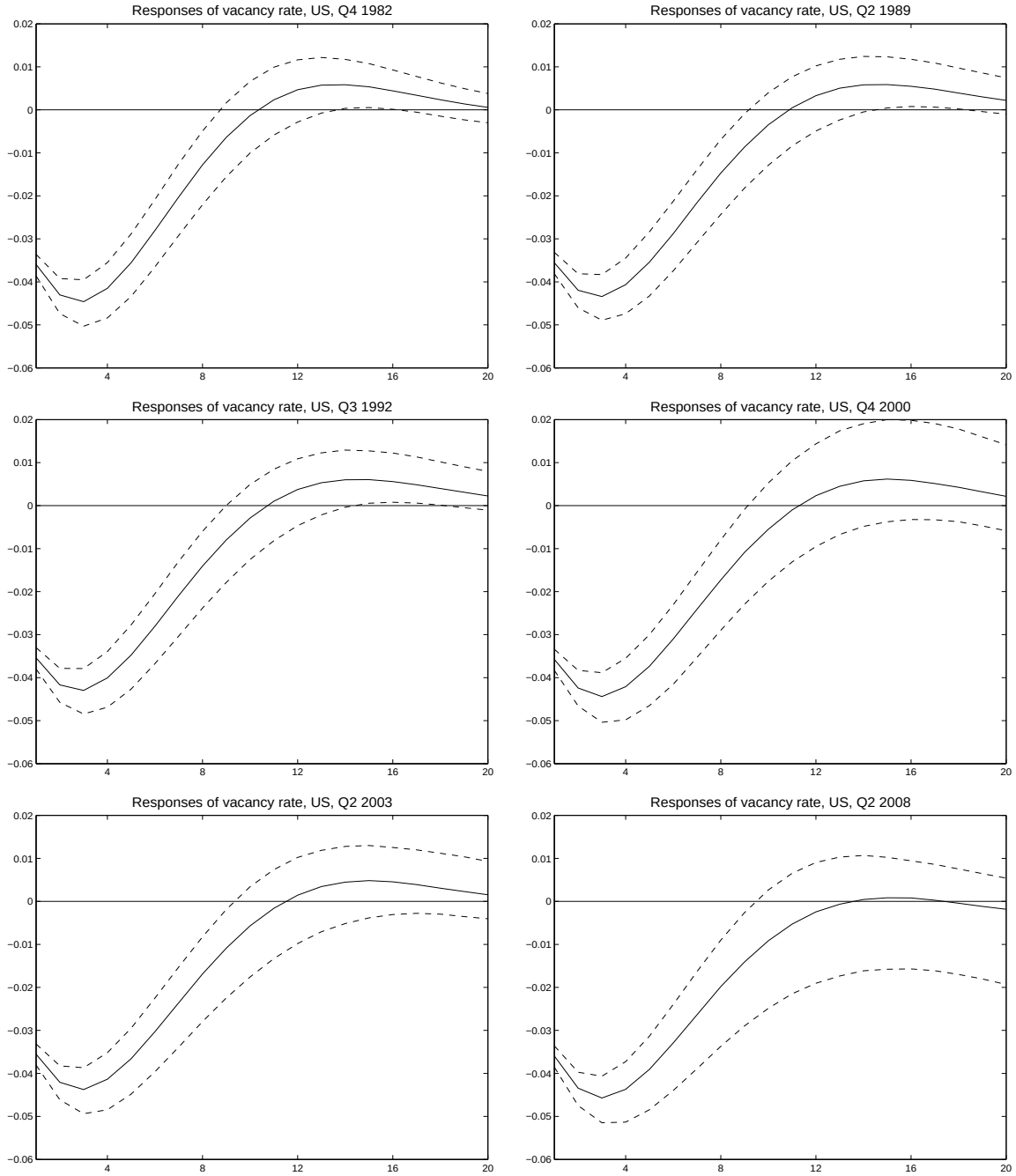


Figure B. 4. Impulse responses of vacancies -*Homo TVP-VAR*, US

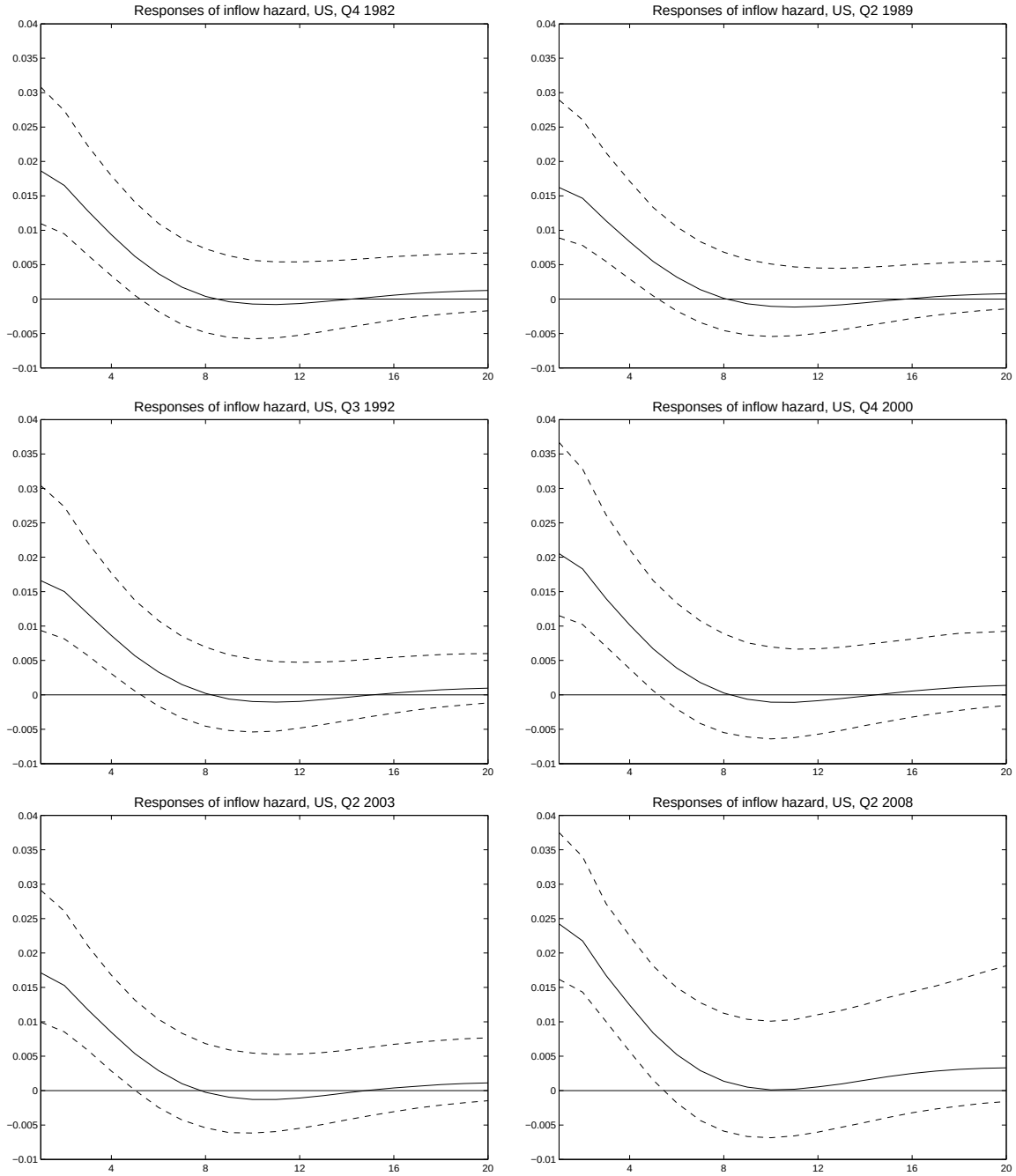


Figure B. 5. Impulse responses of separation hazards -*Hete TVP-VAR*, US

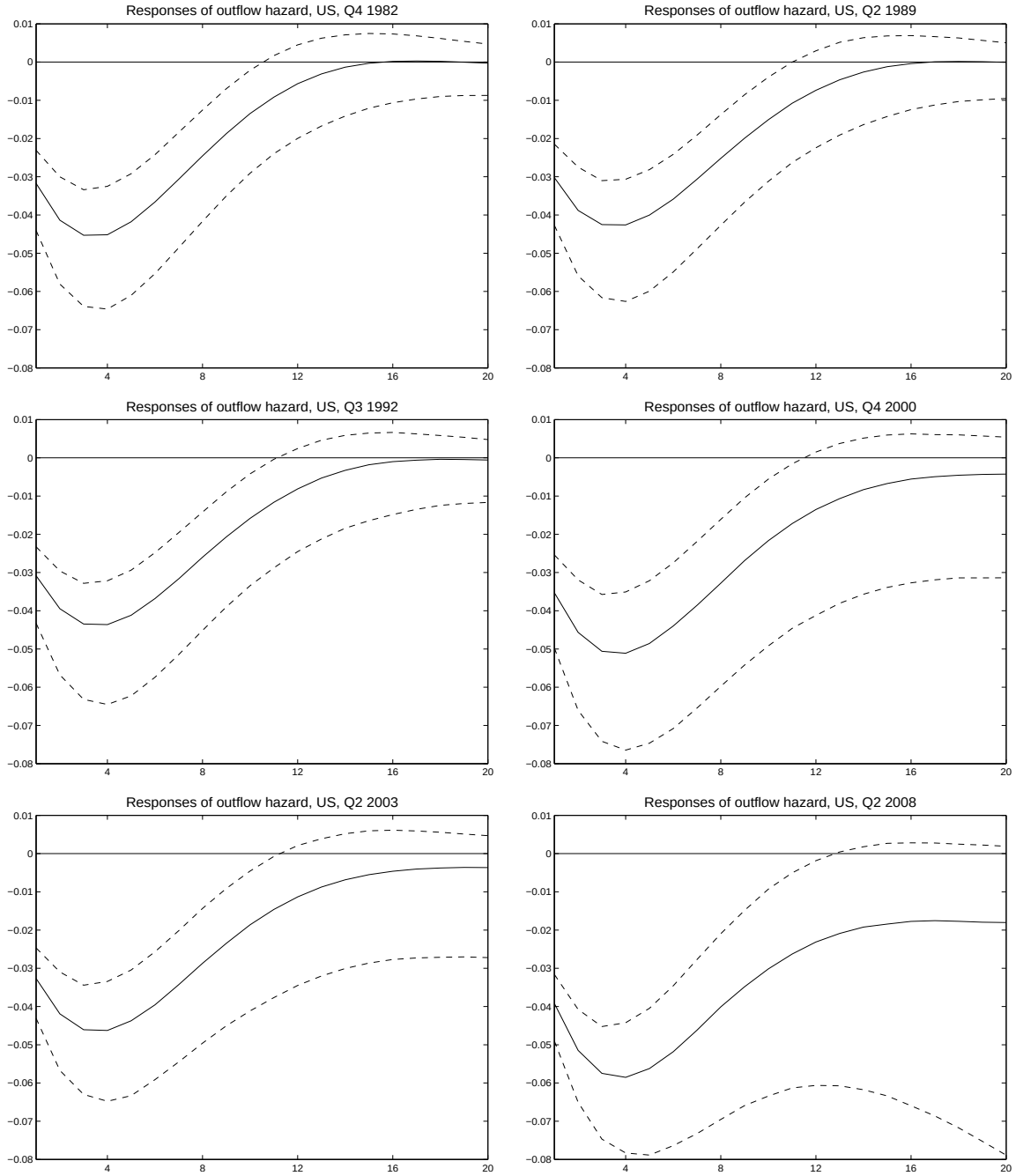


Figure B. 6. Impulse responses of job-finding hazards -*Hete TVP-VAR*, US

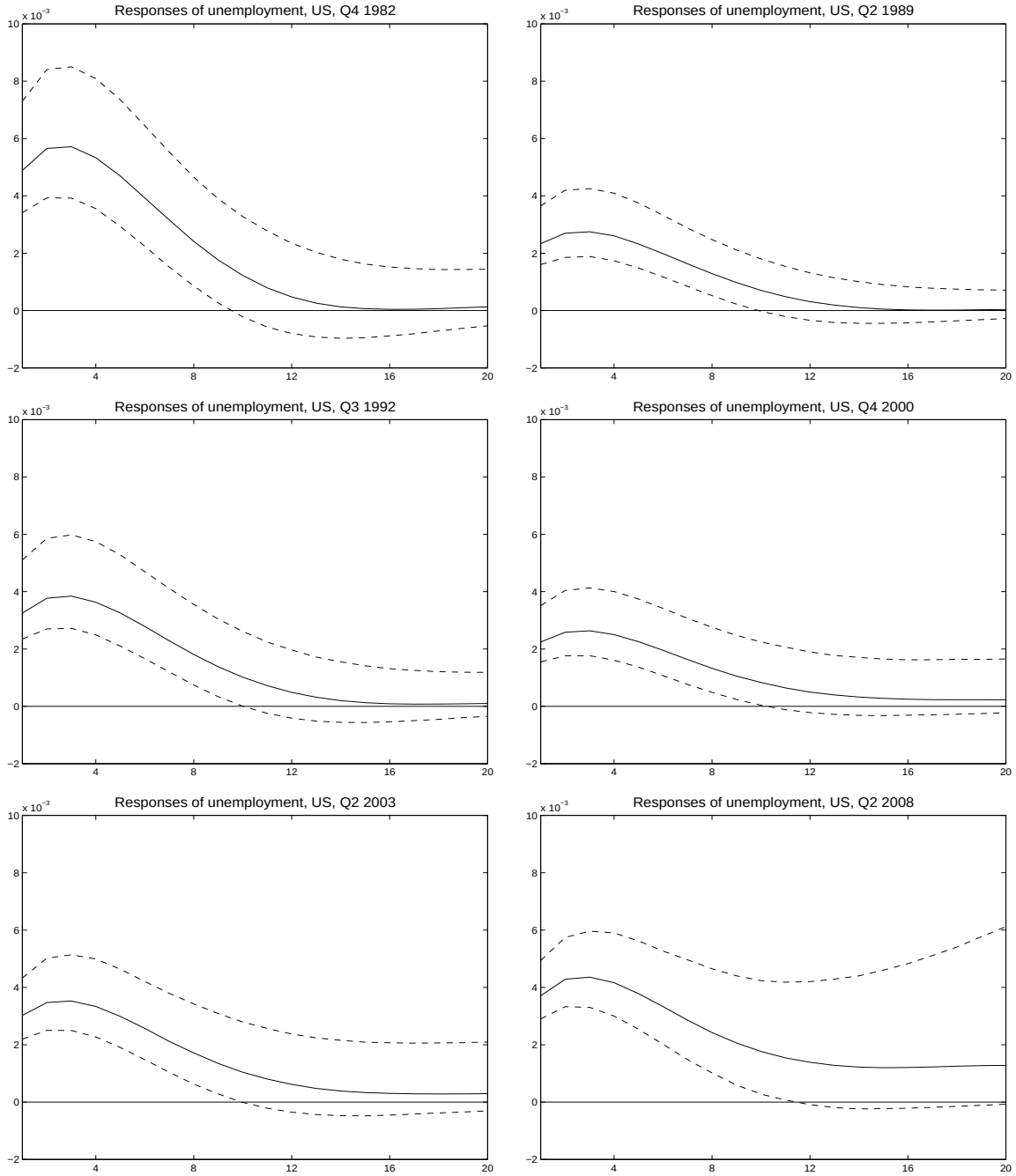


Figure B. 7. Impulse responses of unemployment rates -*Hete TVP-VAR*, US

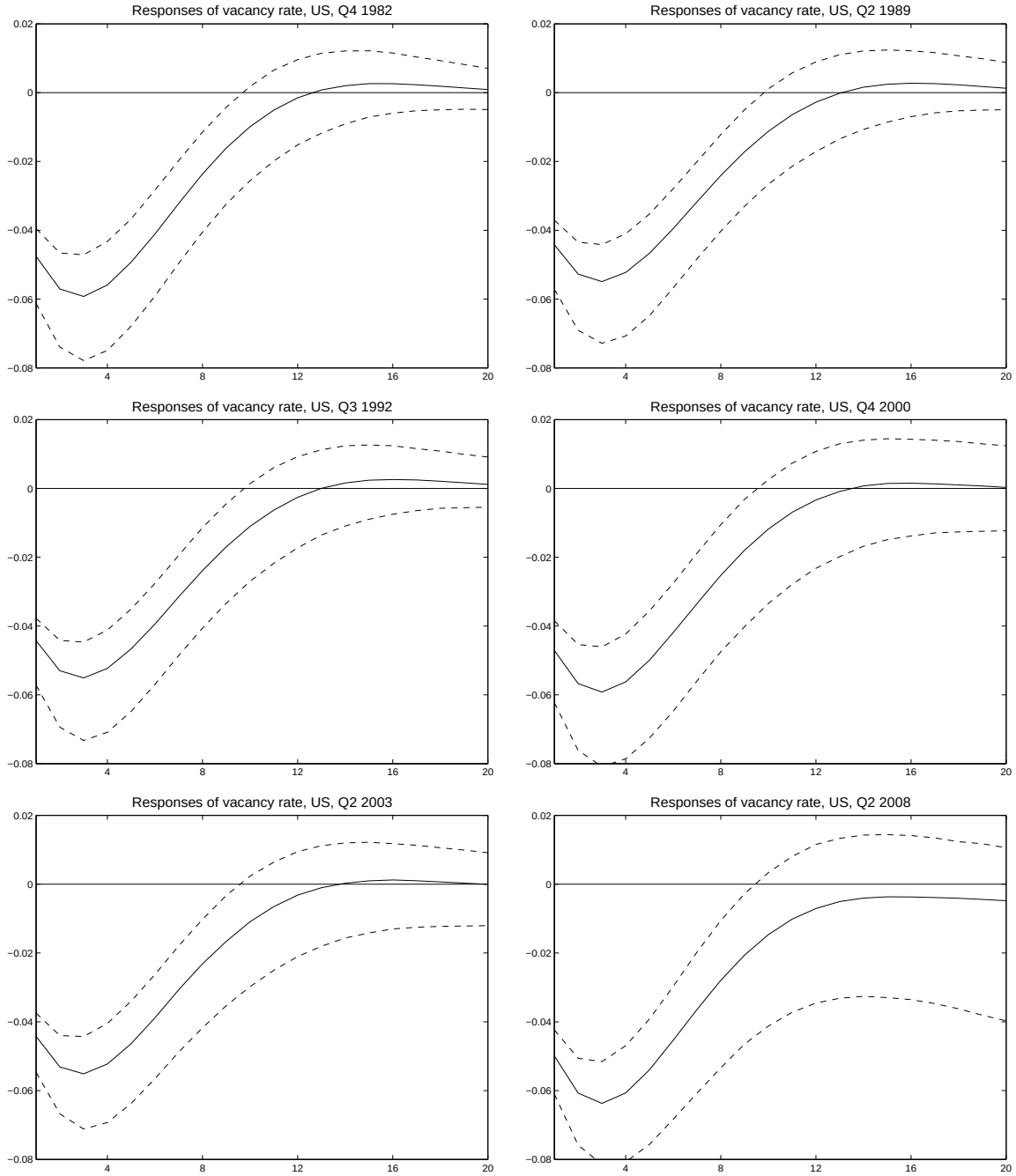


Figure B. 8. Impulse responses of vacancies -*Hete TVP-VAR*, US

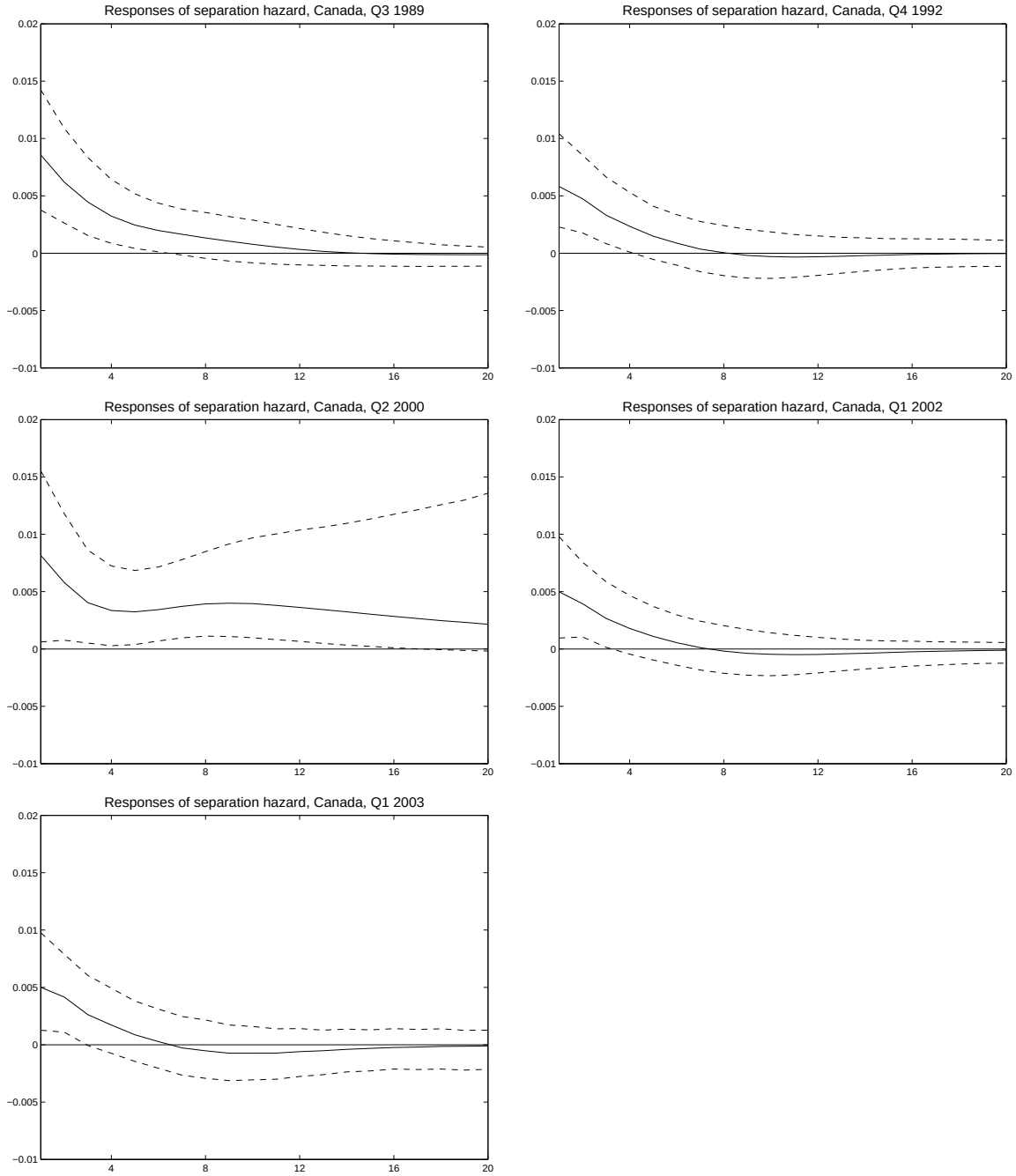


Figure B. 9. Impulse responses of separation hazards -*Homo TVP-VAR*, Canada

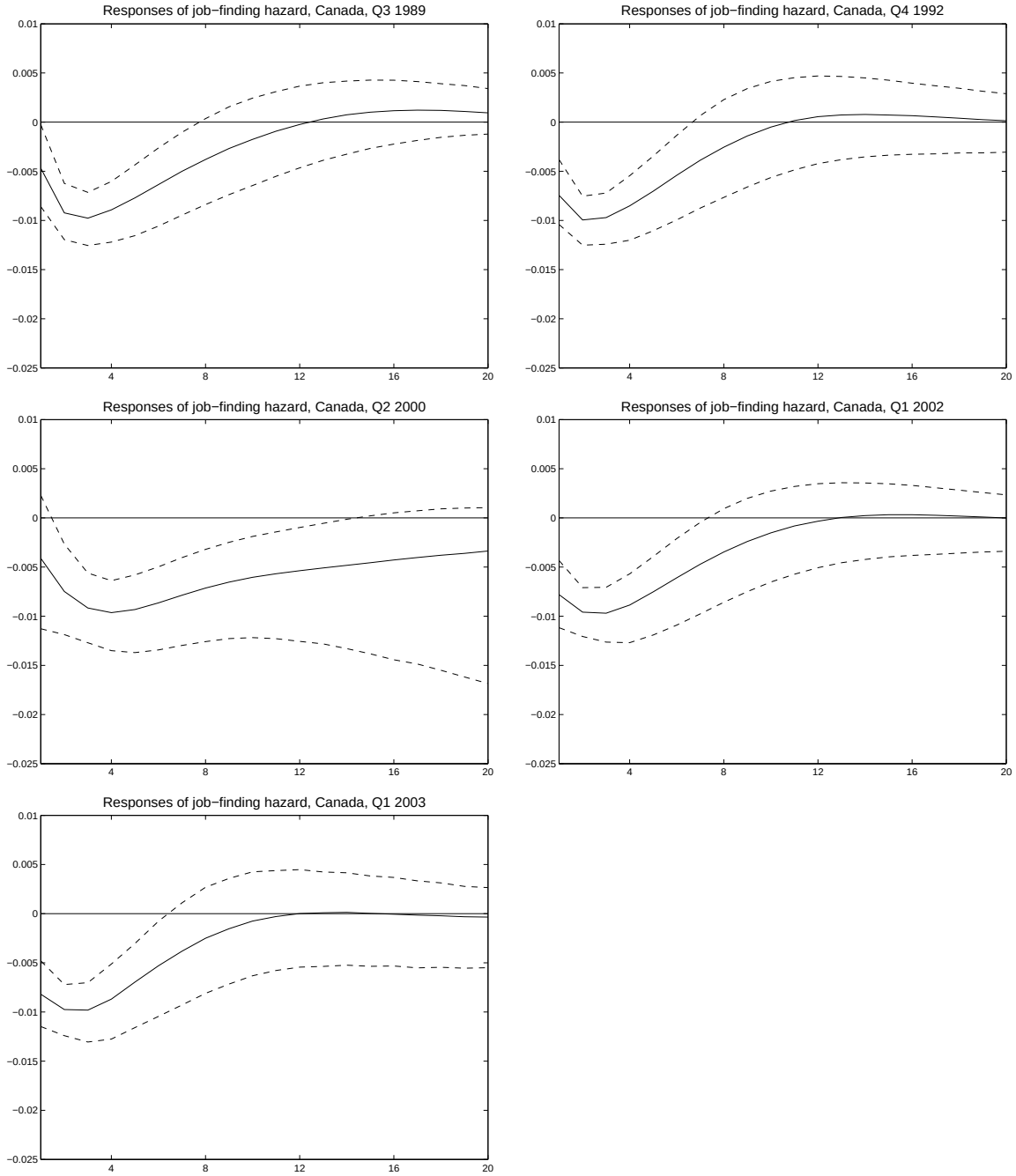


Figure B. 10. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada

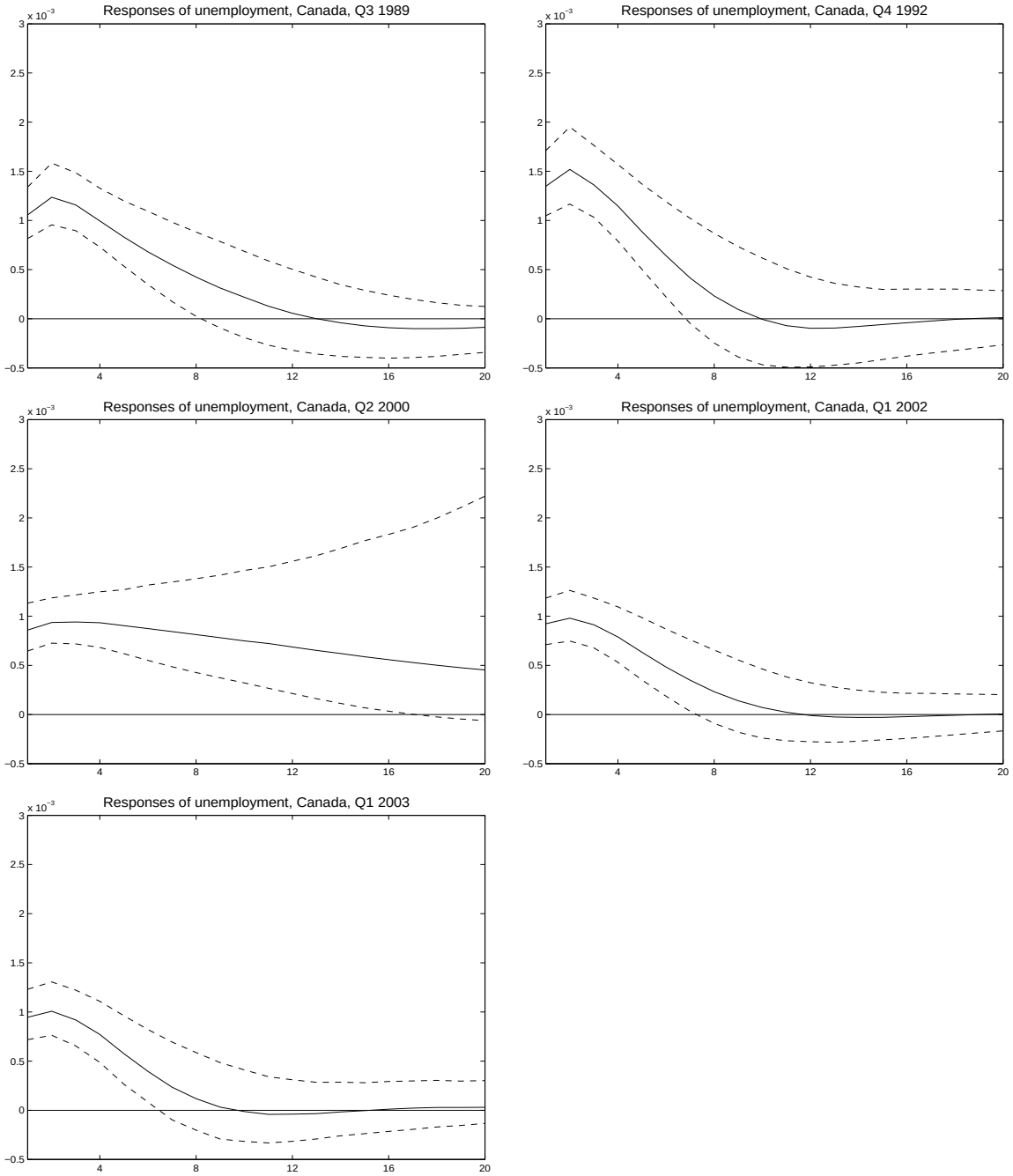


Figure B. 11. Impulse responses of unemployment rates -*Homo TVP-VAR*, Canada

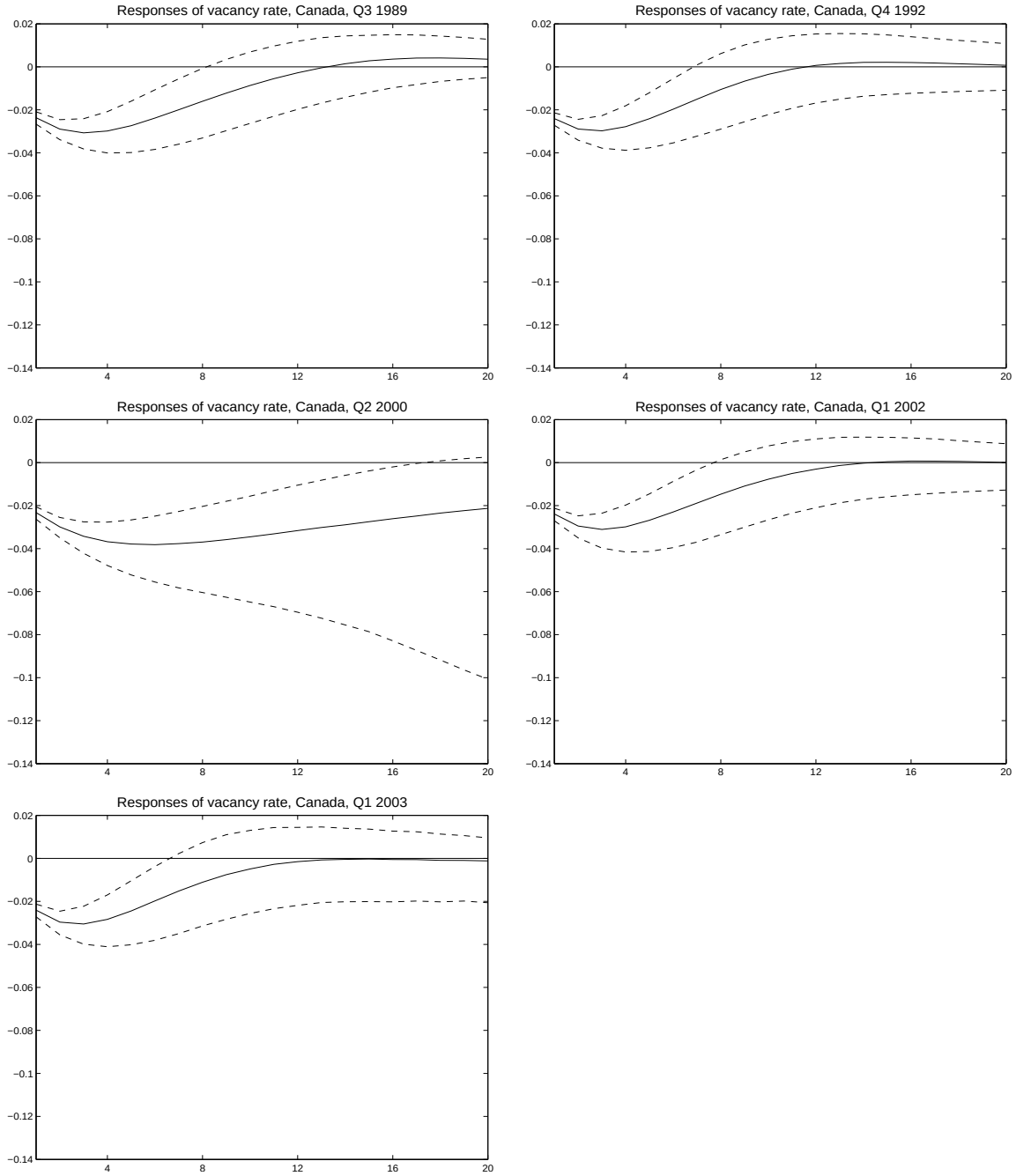


Figure B. 12. Impulse responses of vacancies -*Homo TVP-VAR*, Canada

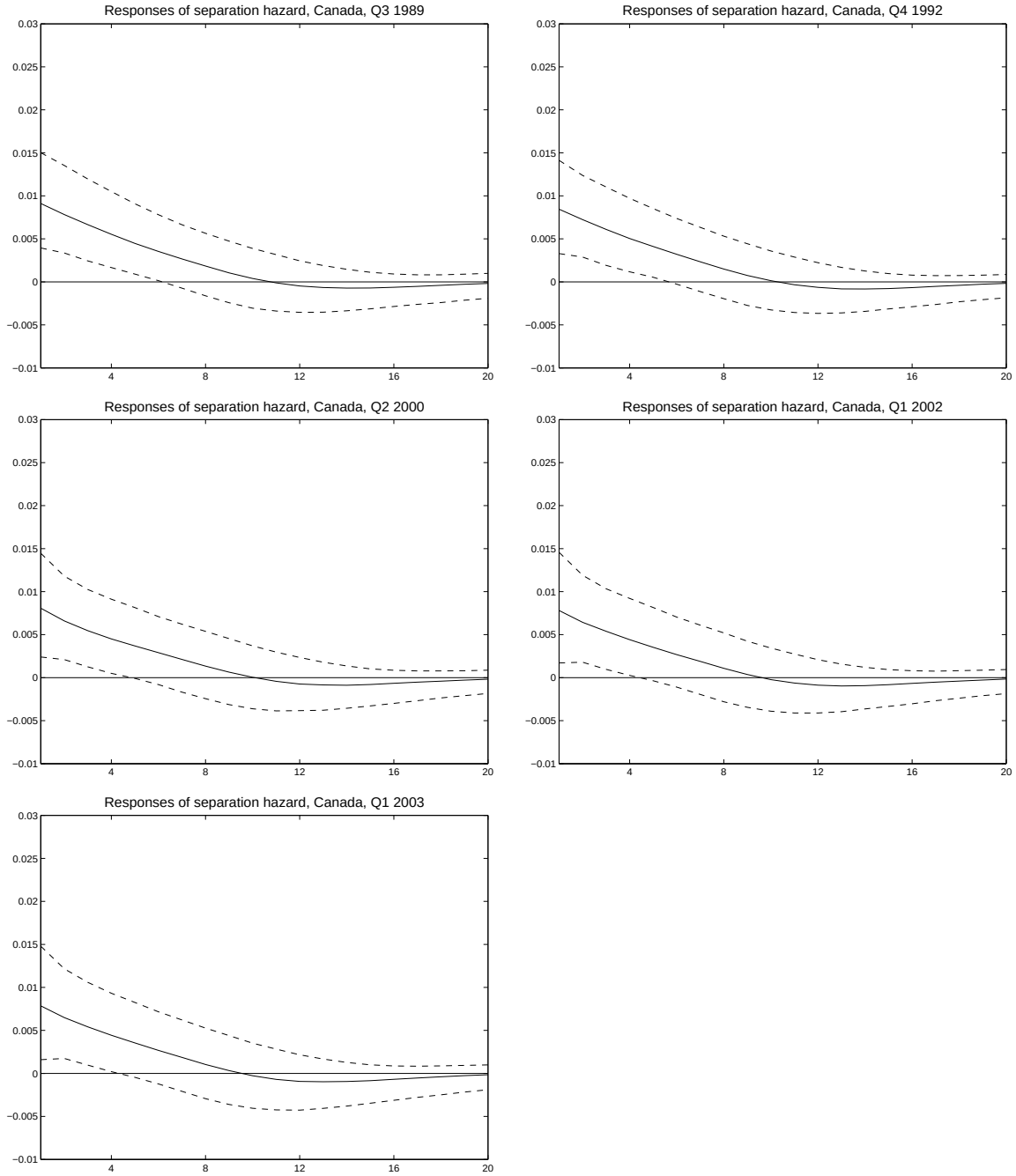


Figure B. 13. Impulse responses of separation hazards -*Hete TVP-VAR*, Canada

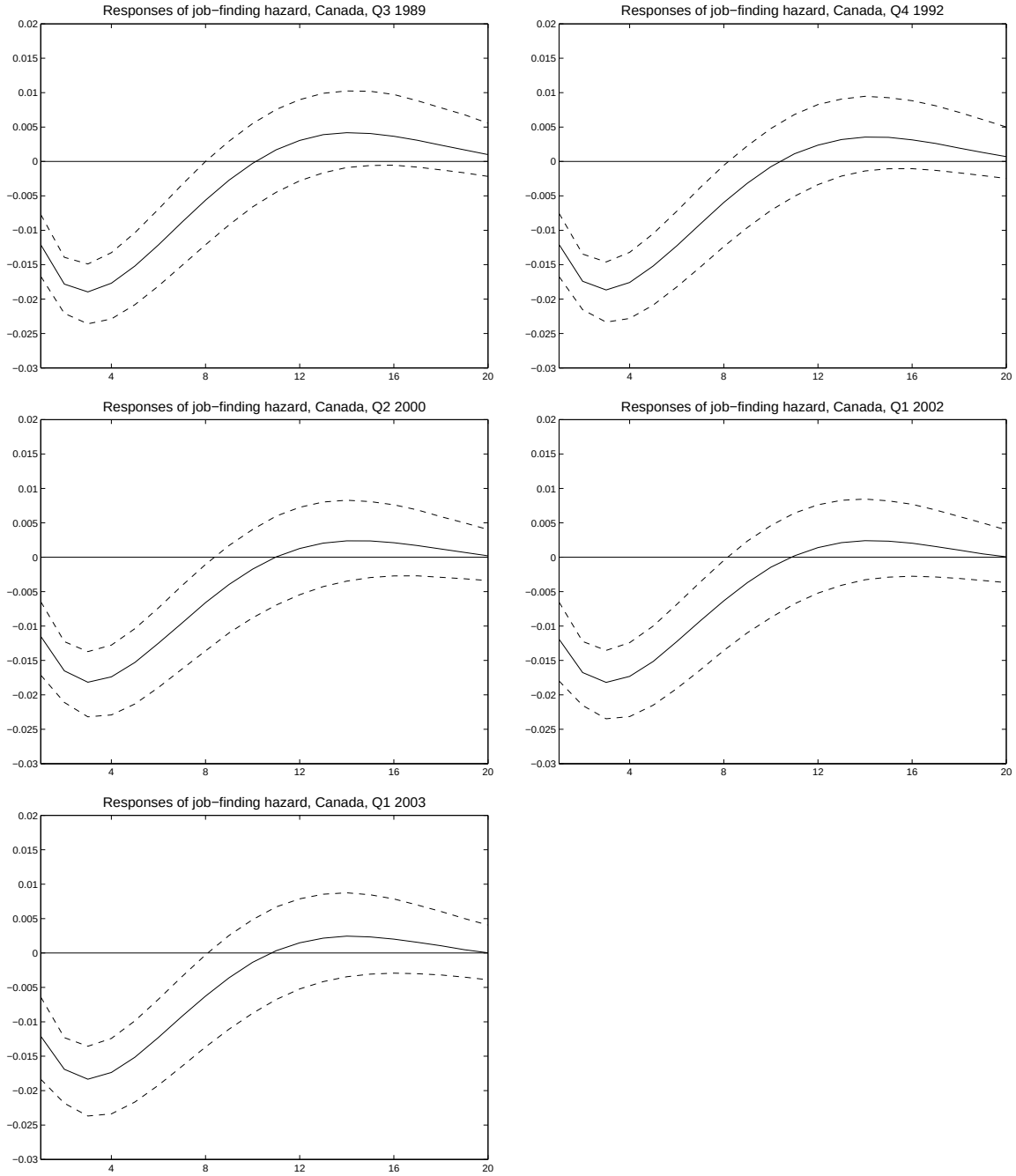


Figure B. 14. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Canada

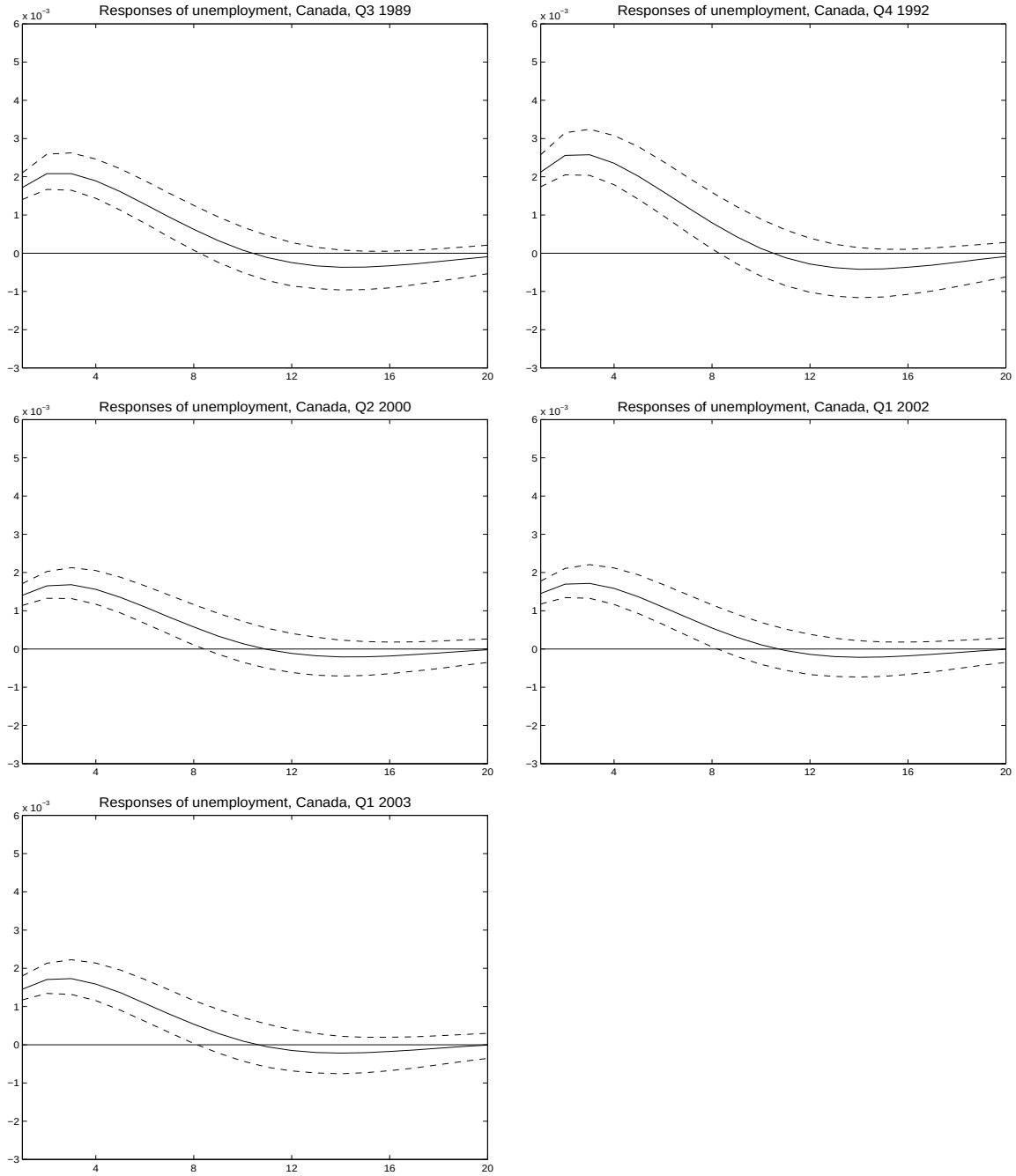


Figure B. 15. Impulse responses of unemployment rates -*Hete TVP-VAR*, Canada

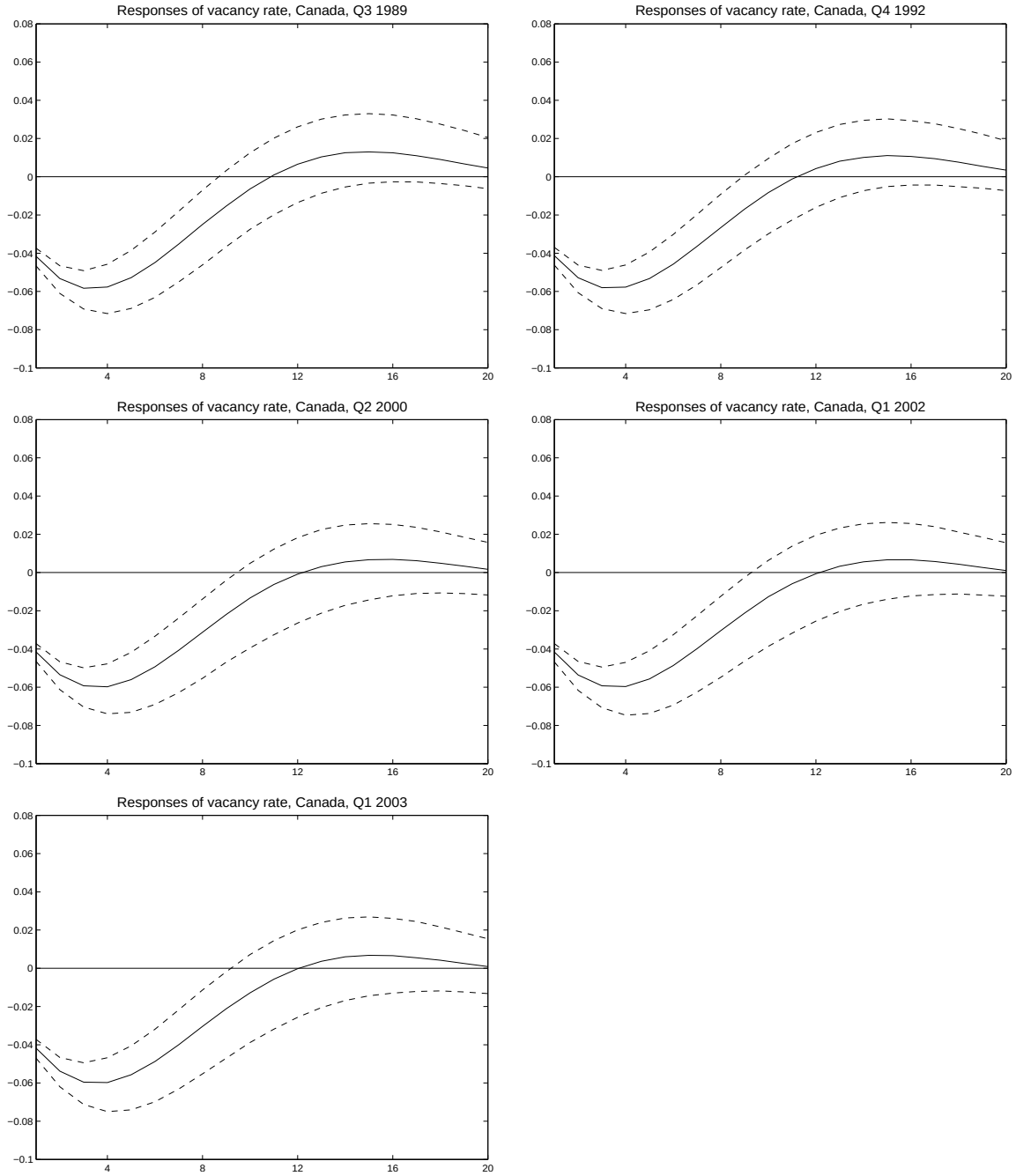


Figure B. 16. Impulse responses of vacancies -*Hete TVP-VAR*, Canada

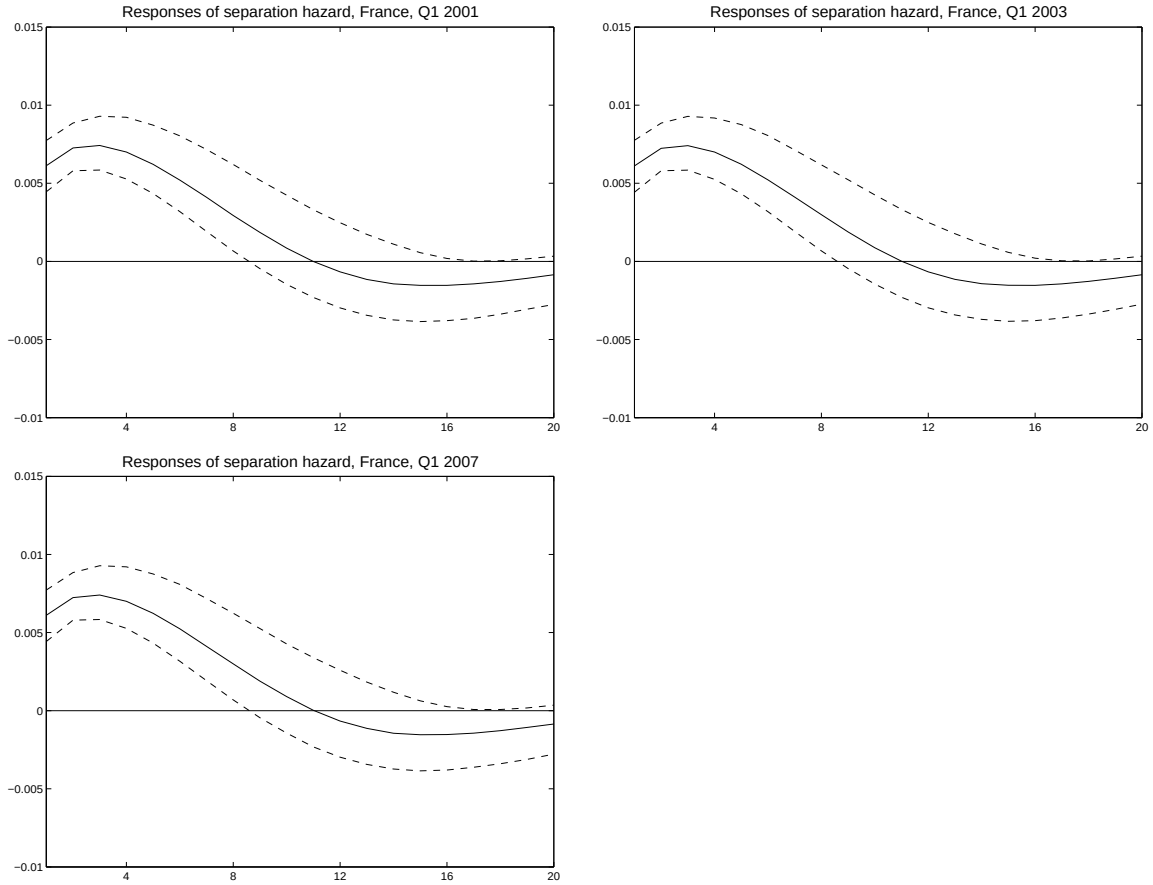


Figure B. 17. Impulse responses of separation hazards -*Homo TVP-VAR*, France

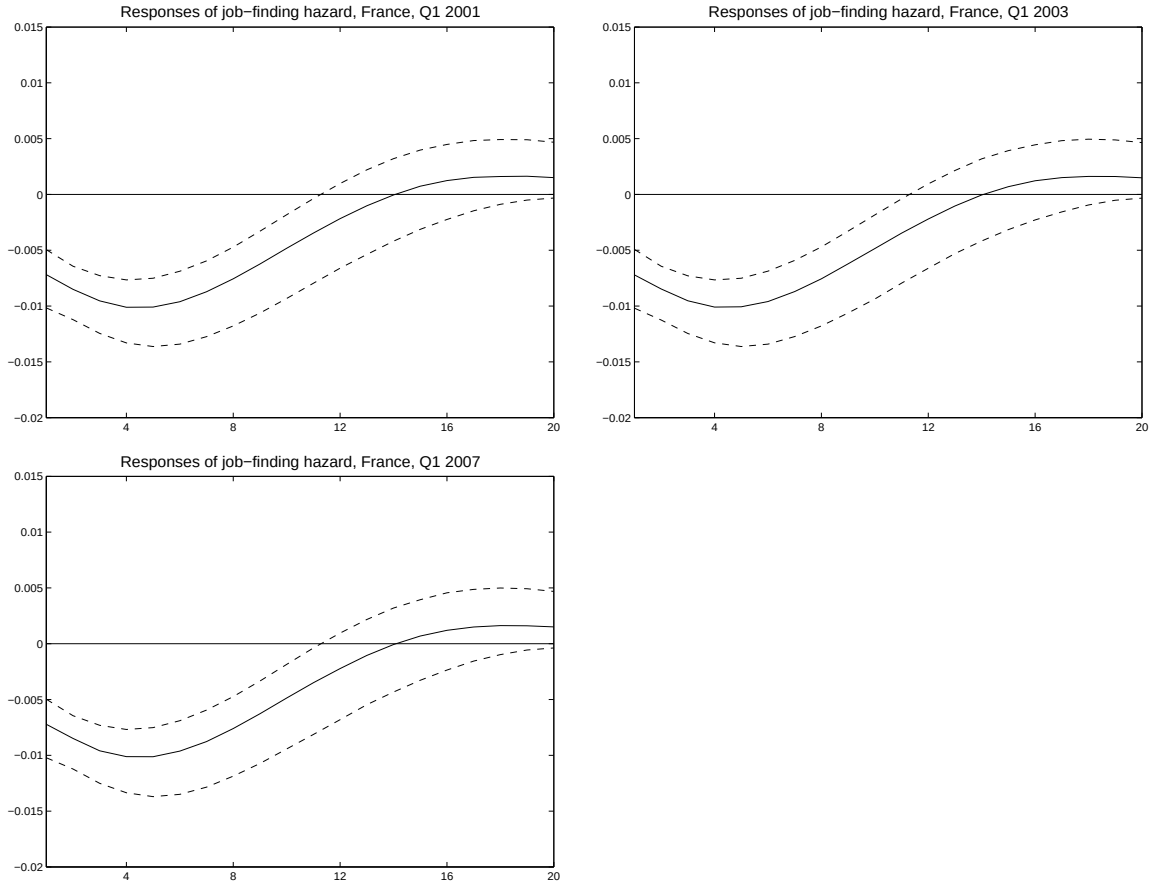


Figure B. 18. Impulse responses of job-finding hazards -*Homo TVP-VAR*, France

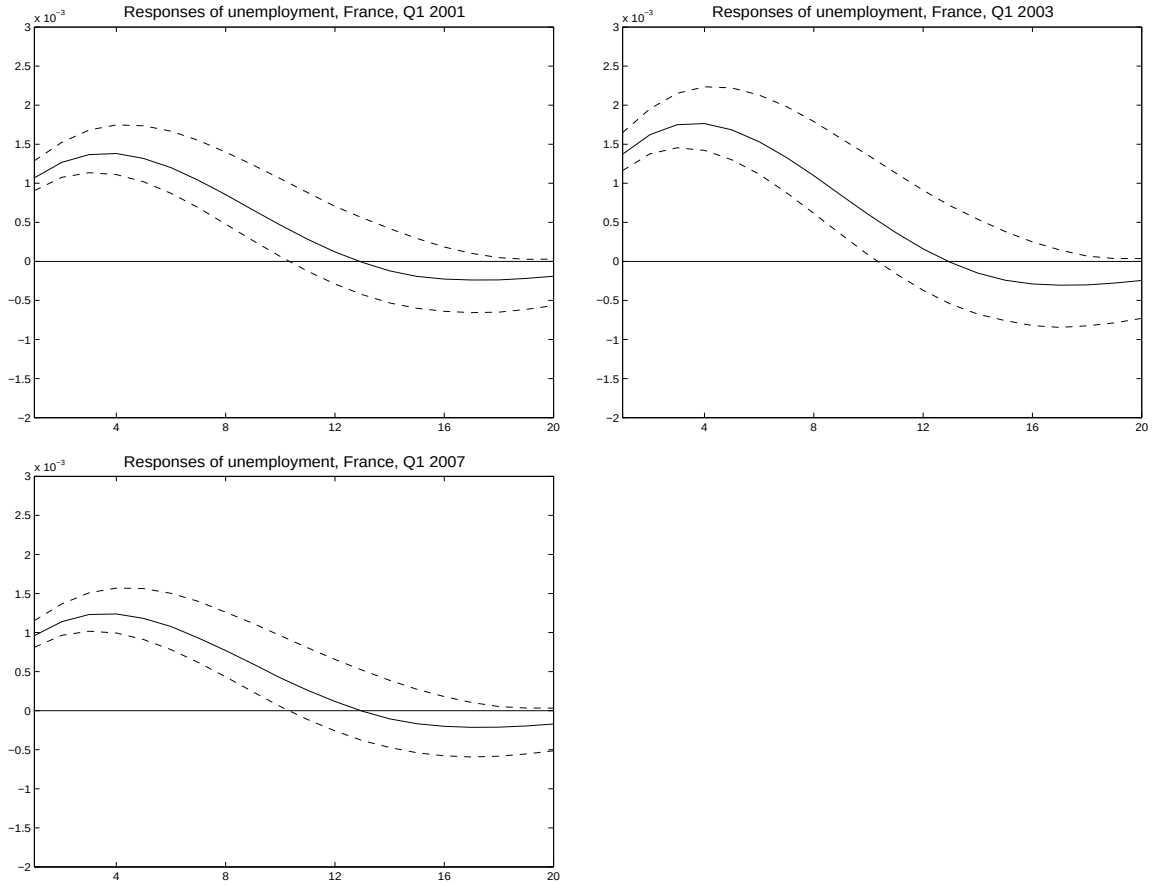


Figure B. 19. Impulse responses of unemployment rates -*Homo TVP-VAR*, France

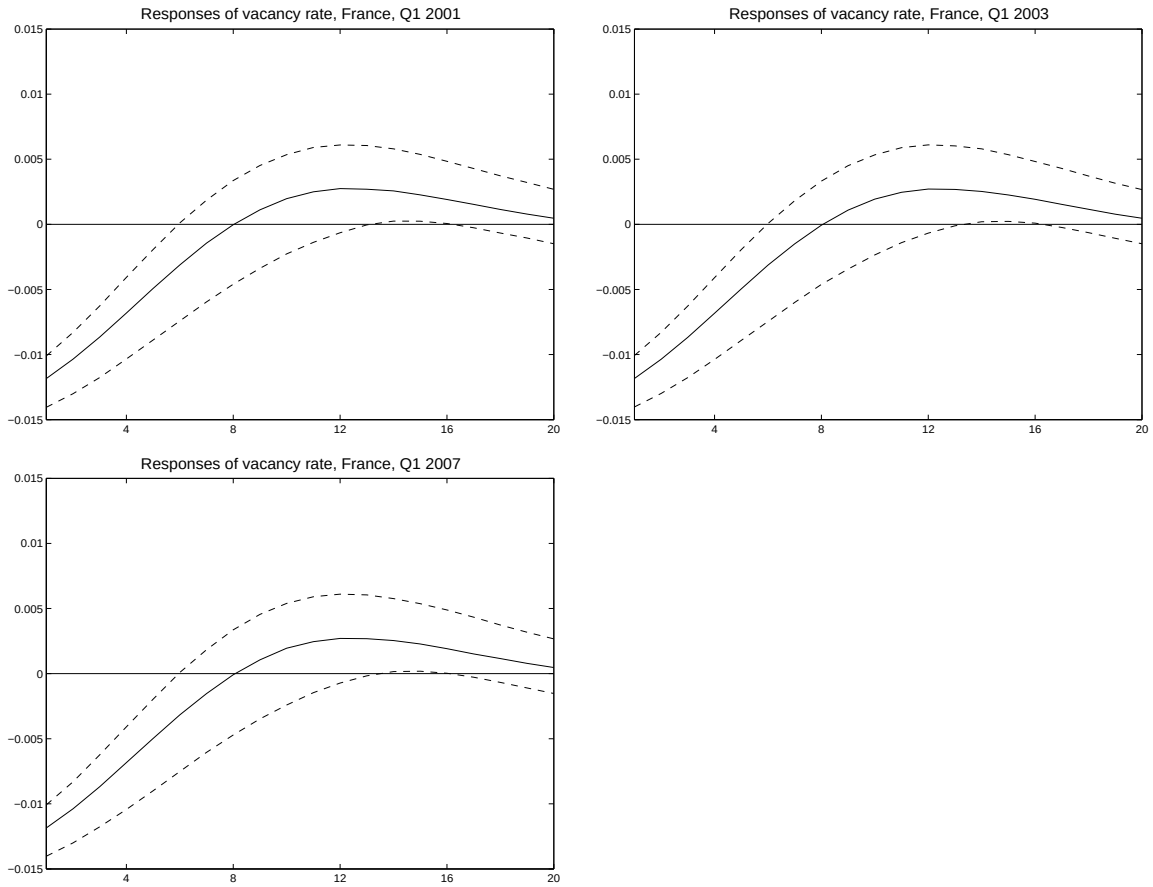


Figure B. 20. Impulse responses of vacancies -*Homo TVP-VAR*, France

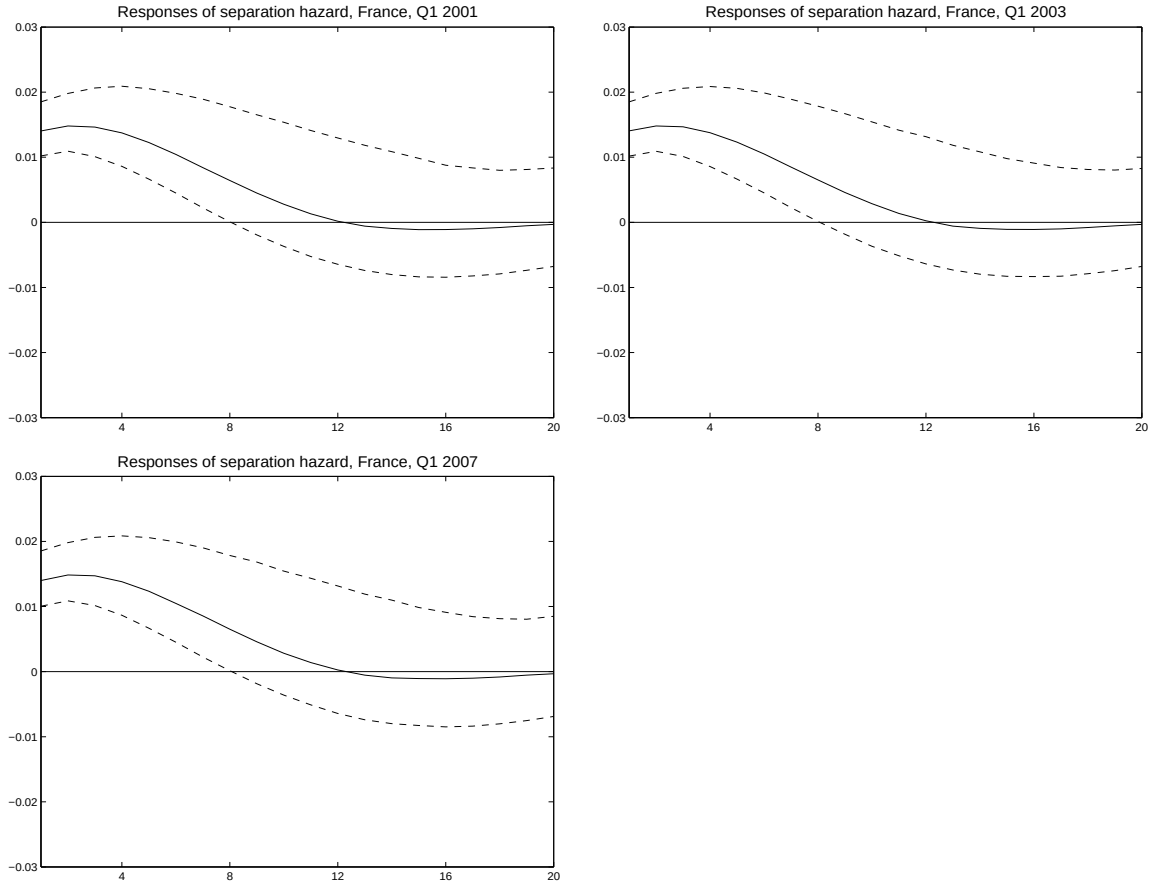


Figure B. 21. Impulse responses of separation hazards -*Hete TVP-VAR*, France

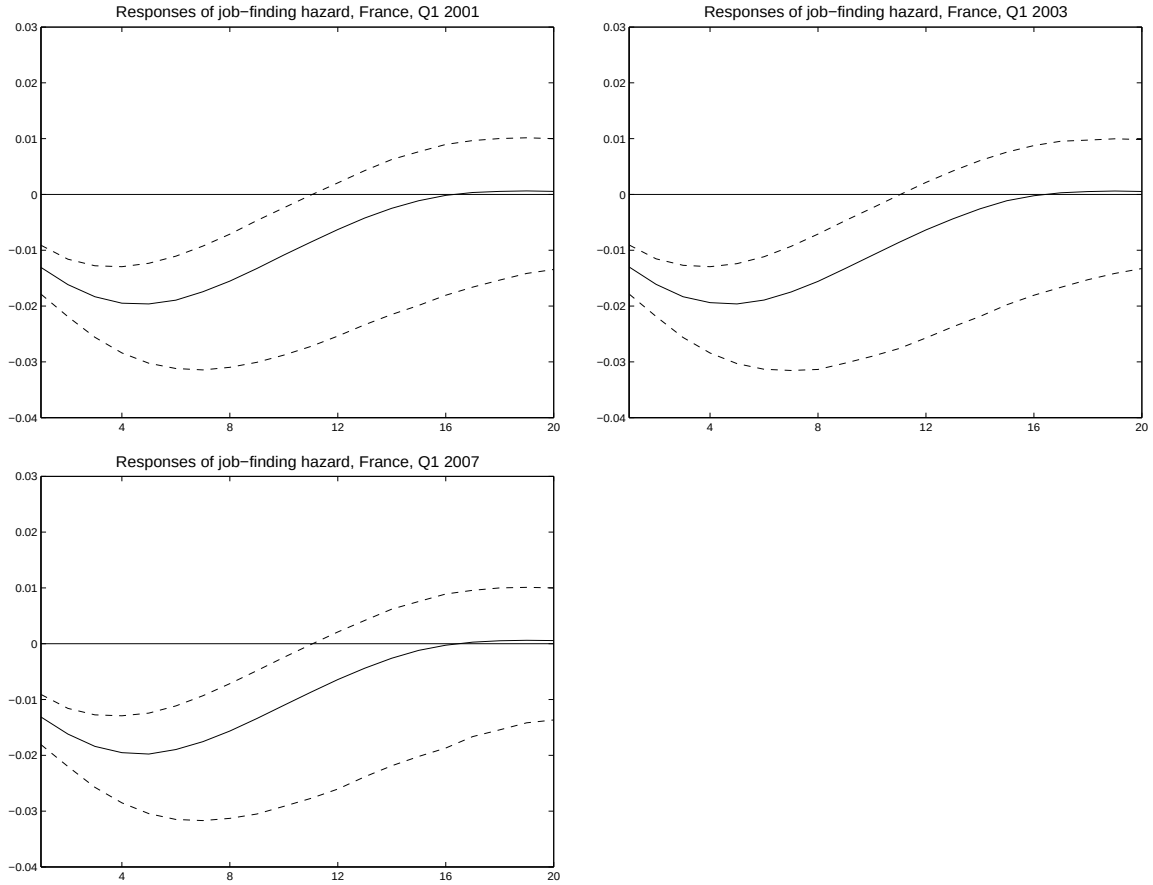


Figure B. 22. Impulse responses of job-finding hazards -*Hete TVP-VAR*, France

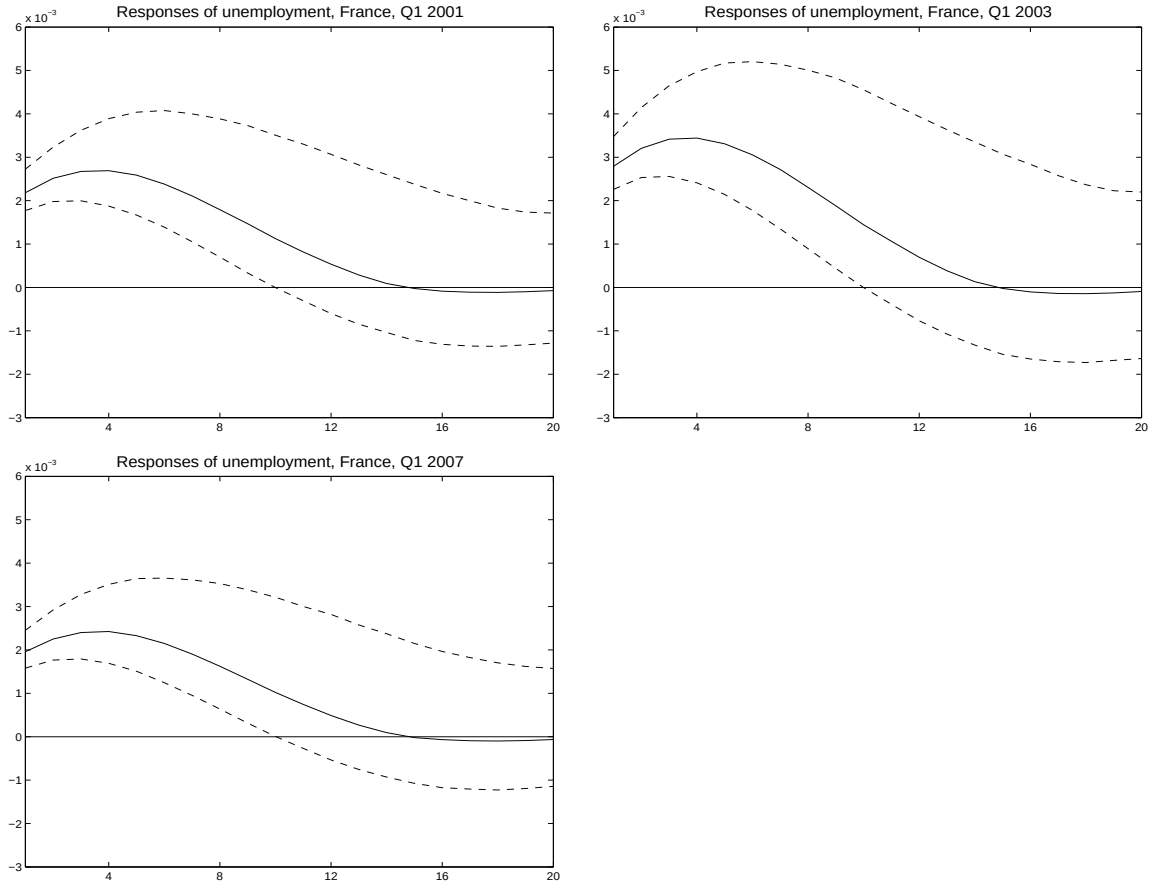


Figure B. 23. Impulse responses of unemployment rates -*Hete TVP-VAR*, France

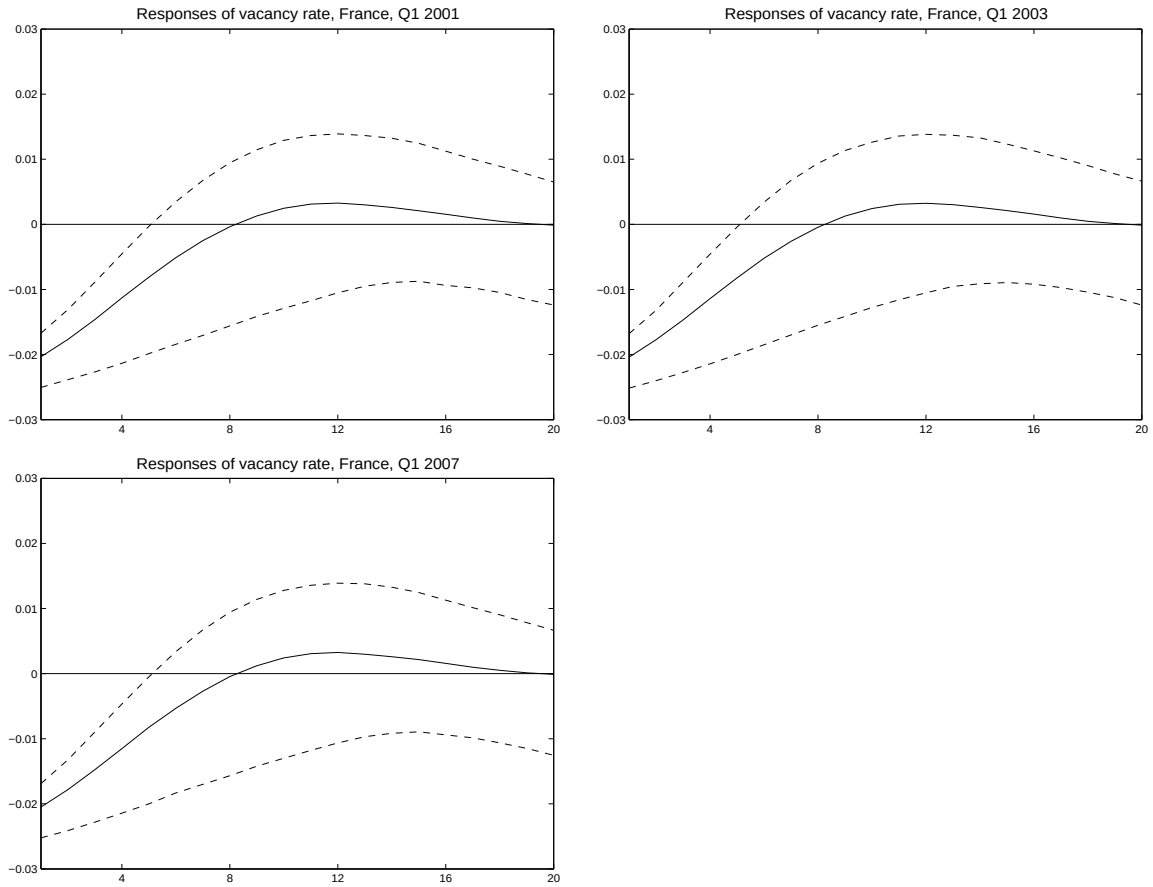


Figure B. 24. Impulse responses of vacancies -*Hete TVP-VAR*, France

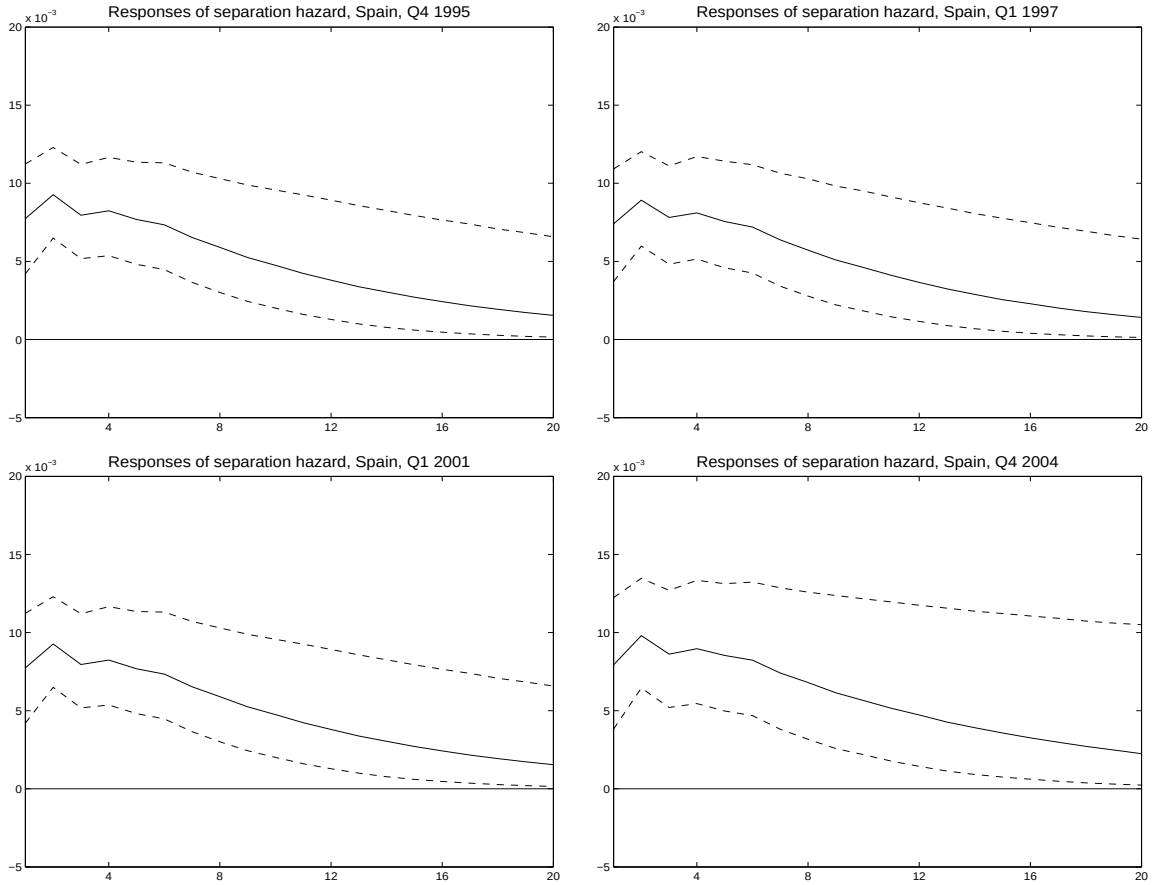


Figure B. 25. Impulse responses of separation hazards -*Homo TVP-VAR*, Spain

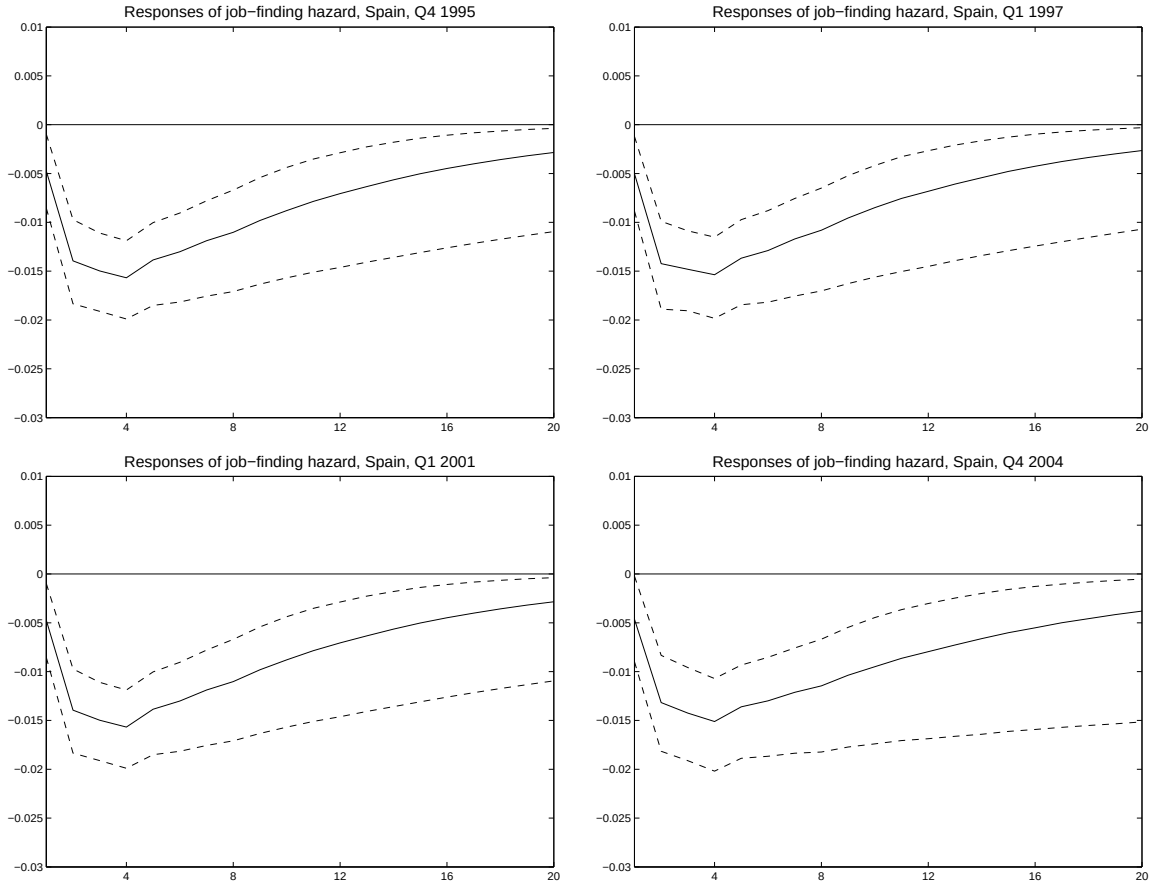


Figure B. 26. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

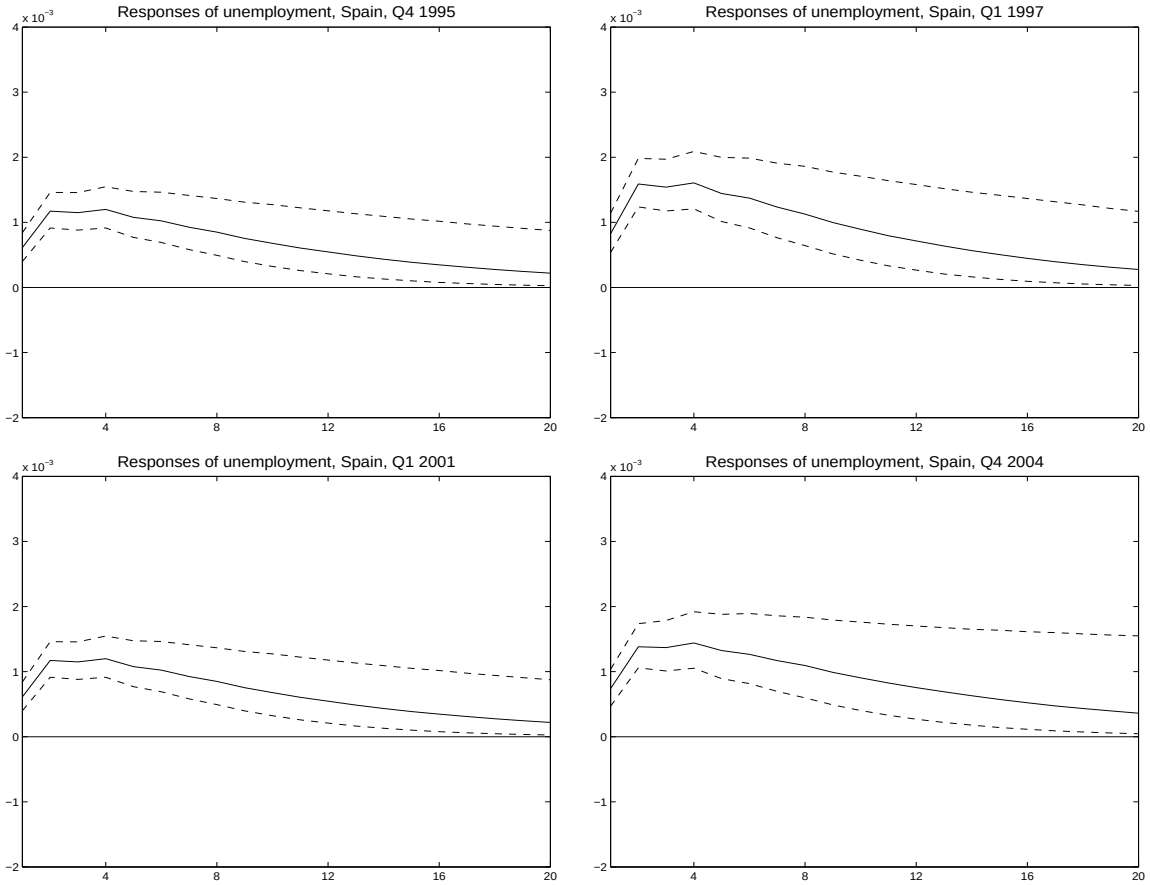


Figure B. 27. Impulse responses of unemployment rates -*Homo TVP-VAR*, Spain

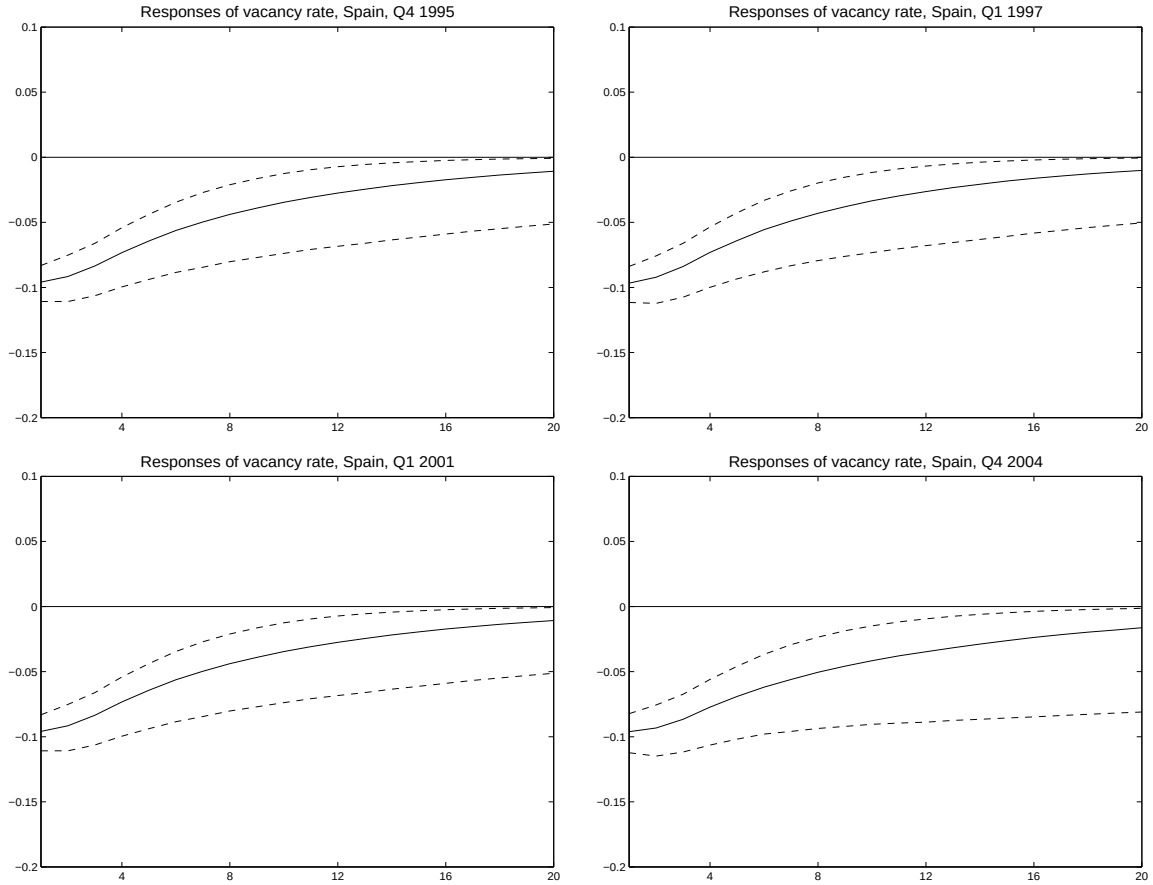


Figure B. 28. Impulse responses of vacancies -*Homo TVP-VAR*, Spain

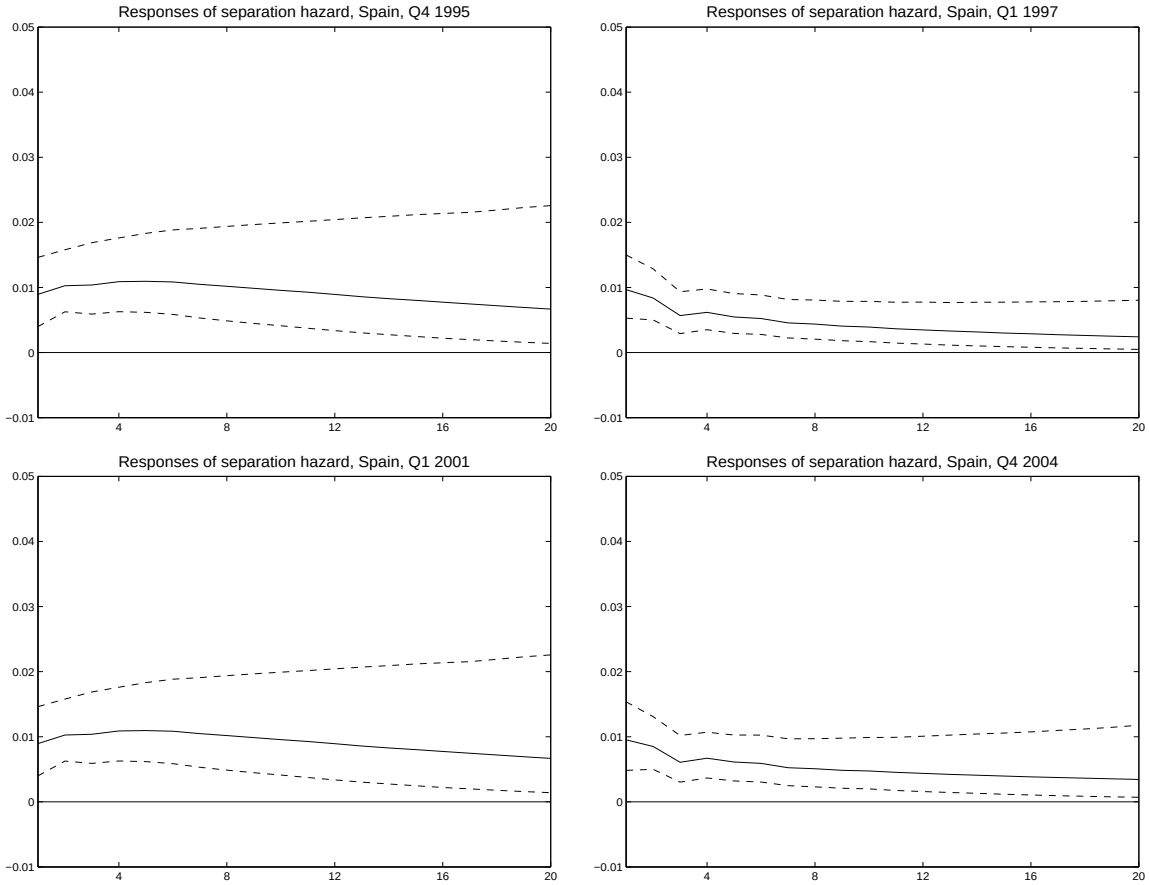


Figure B. 29. Impulse responses of separation hazards -*Hete TVP-VAR*, Spain

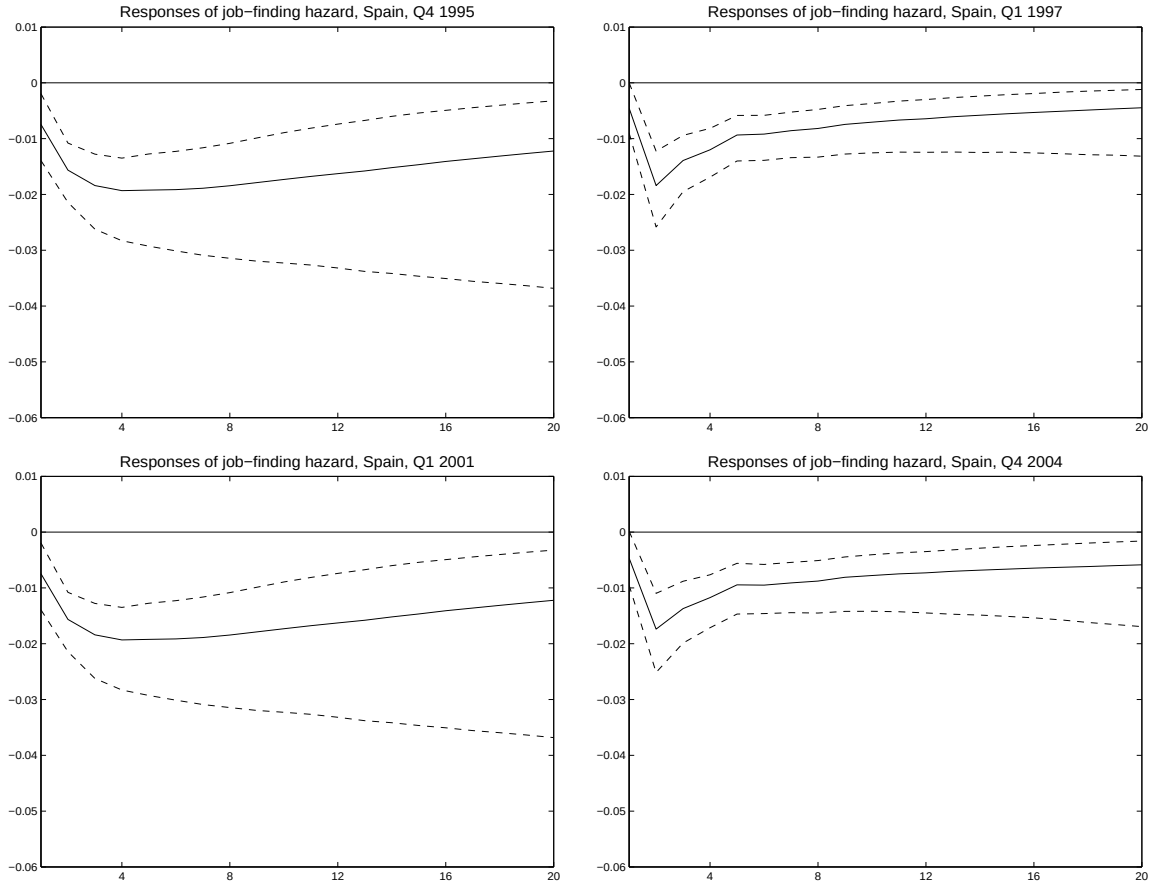


Figure B. 30. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

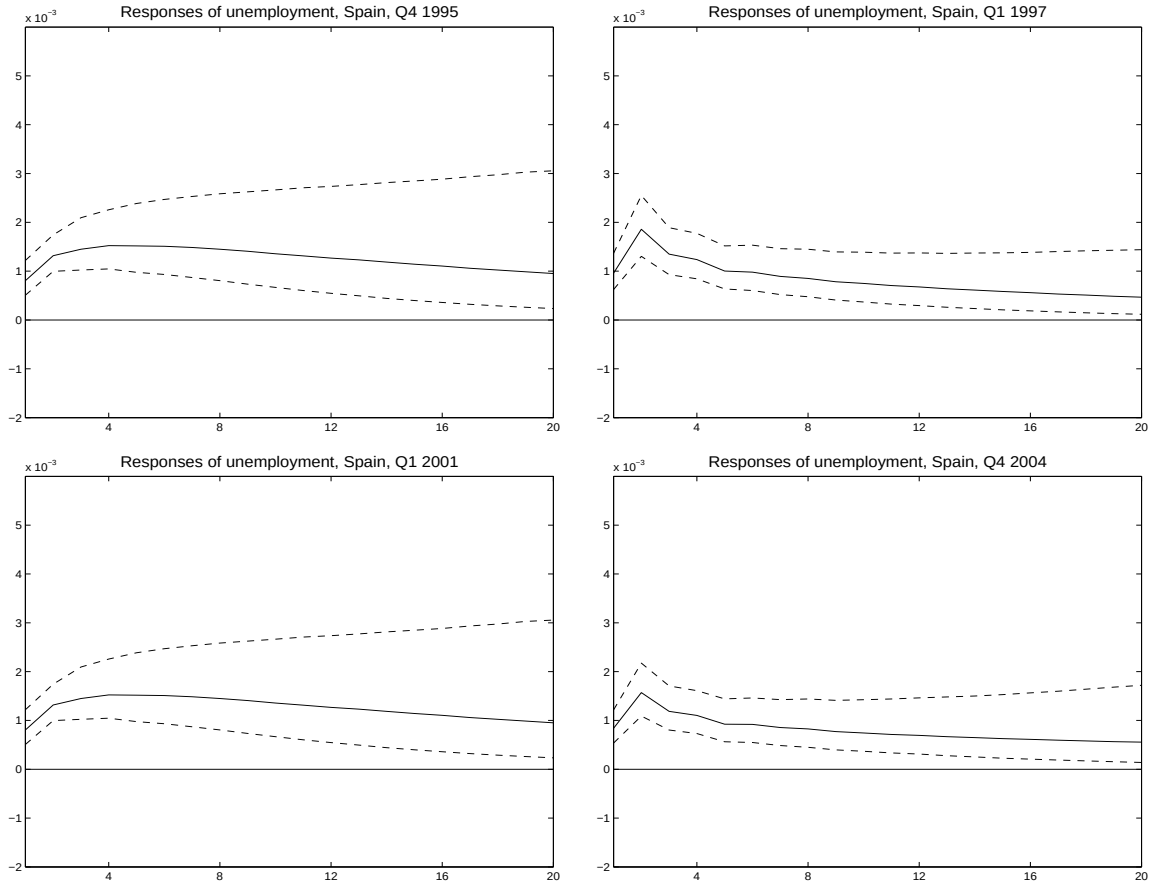


Figure B. 31. Impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

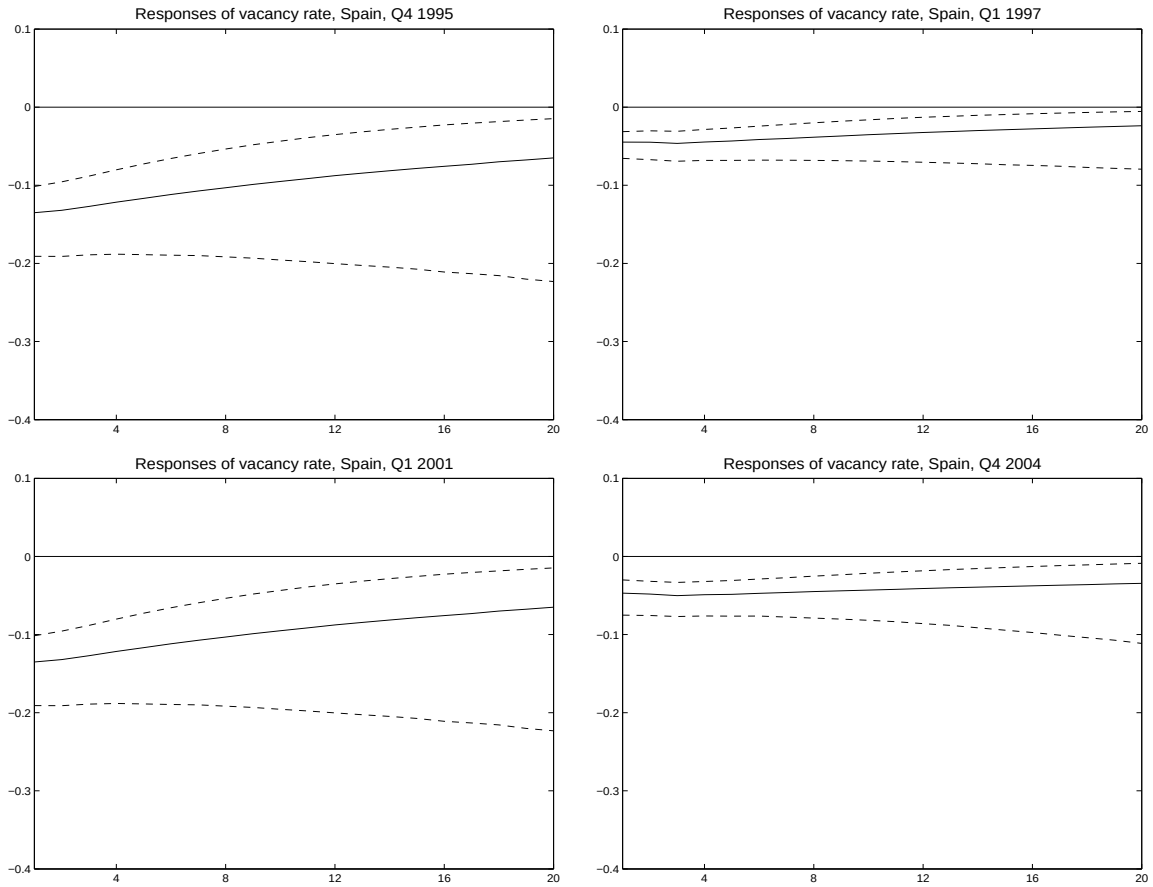


Figure B. 32. Impulse responses of vacancies -*Hete TVP-VAR*, Spain

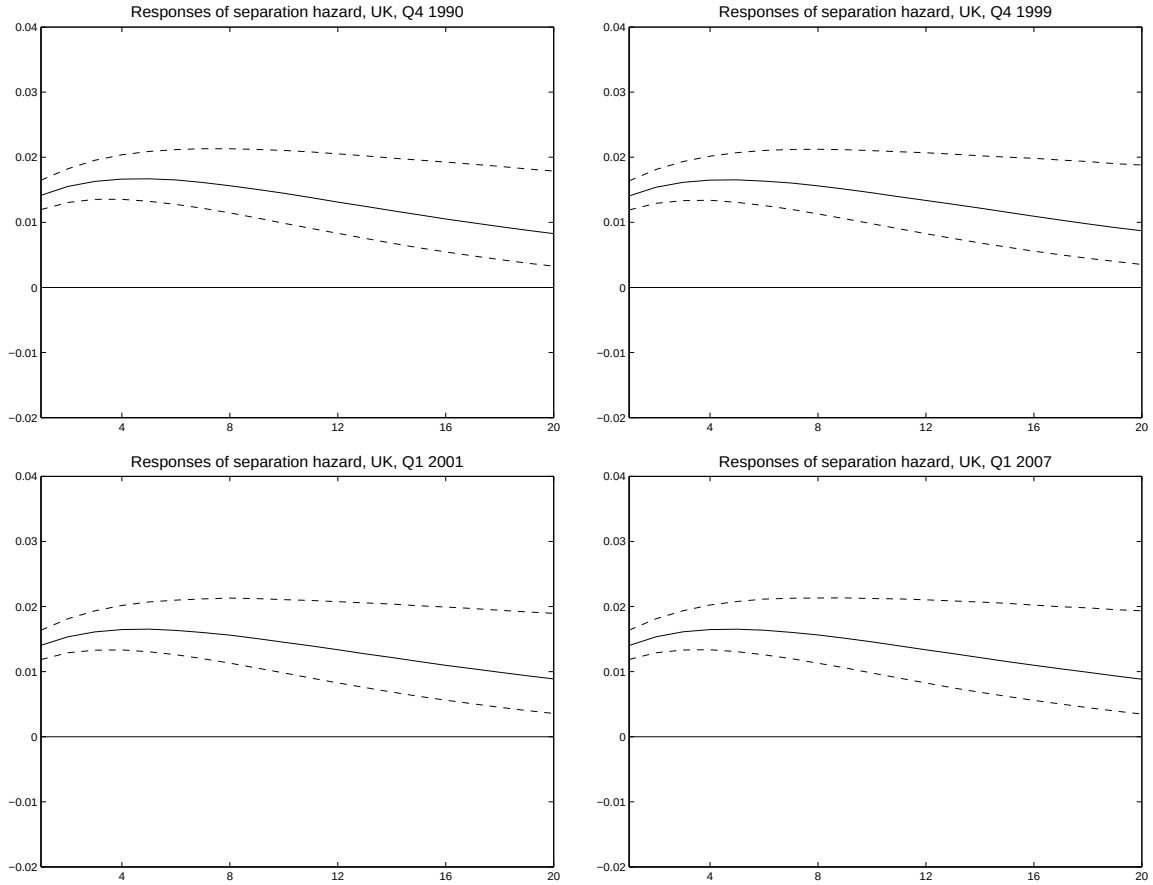


Figure B. 33. Impulse responses of separation hazards -*Homo TVP-VAR*, UK

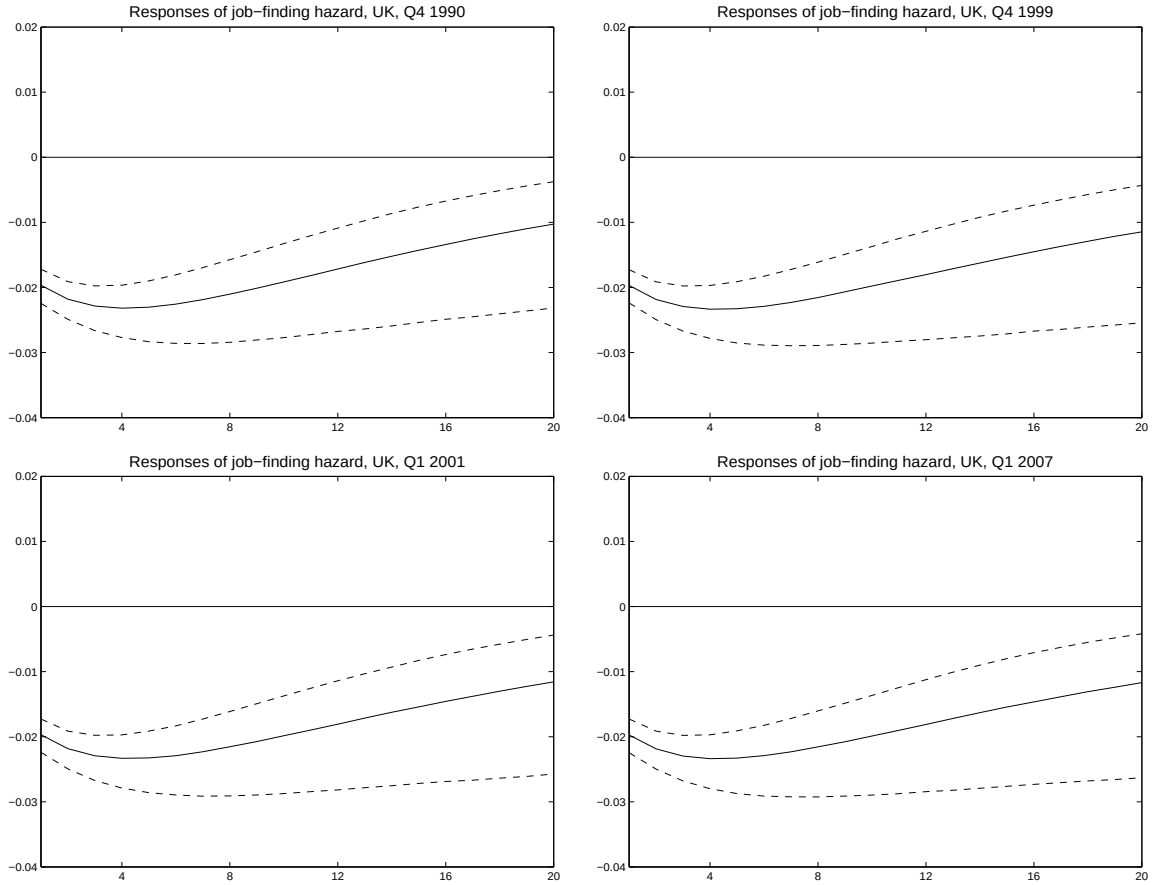


Figure B. 34. Impulse responses of job-finding hazards -*Homo TVP-VAR*, UK

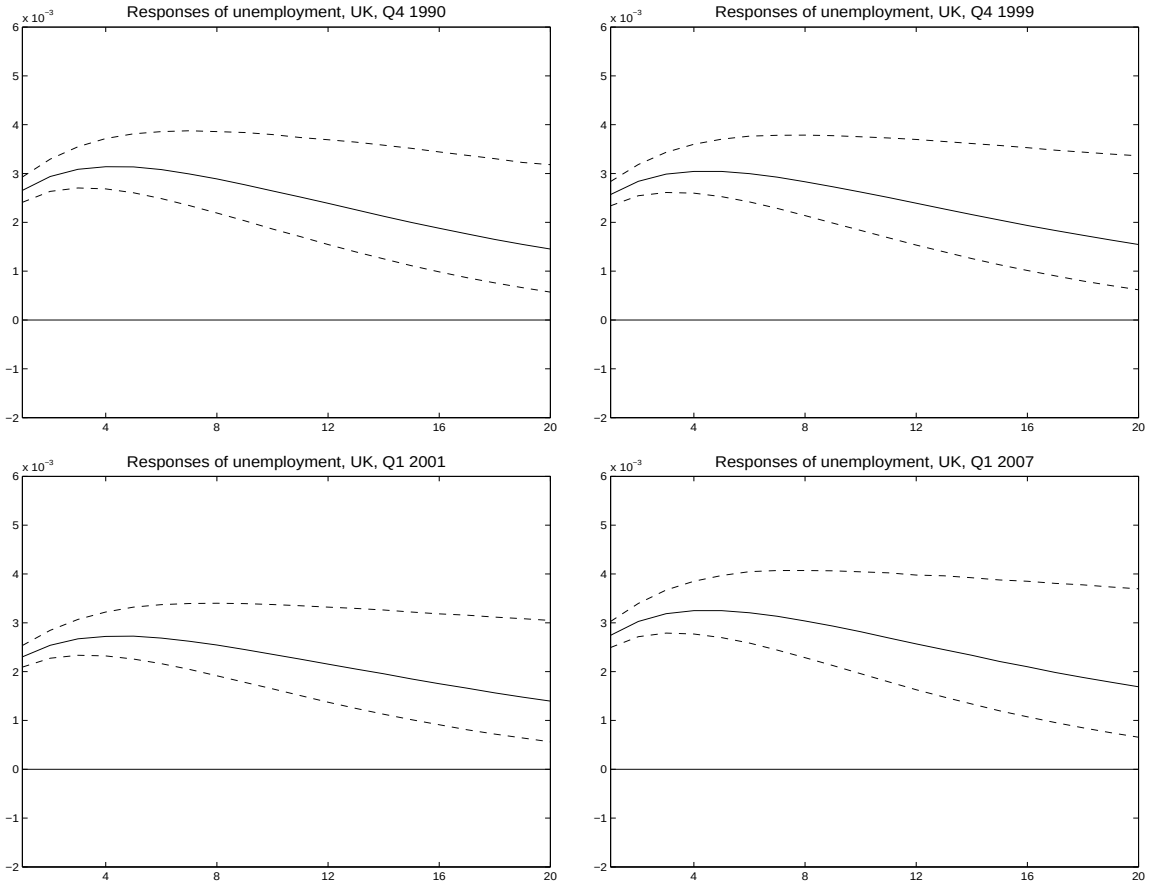


Figure B. 35. Impulse responses of unemployment rates -*Homo TVP-VAR*, UK

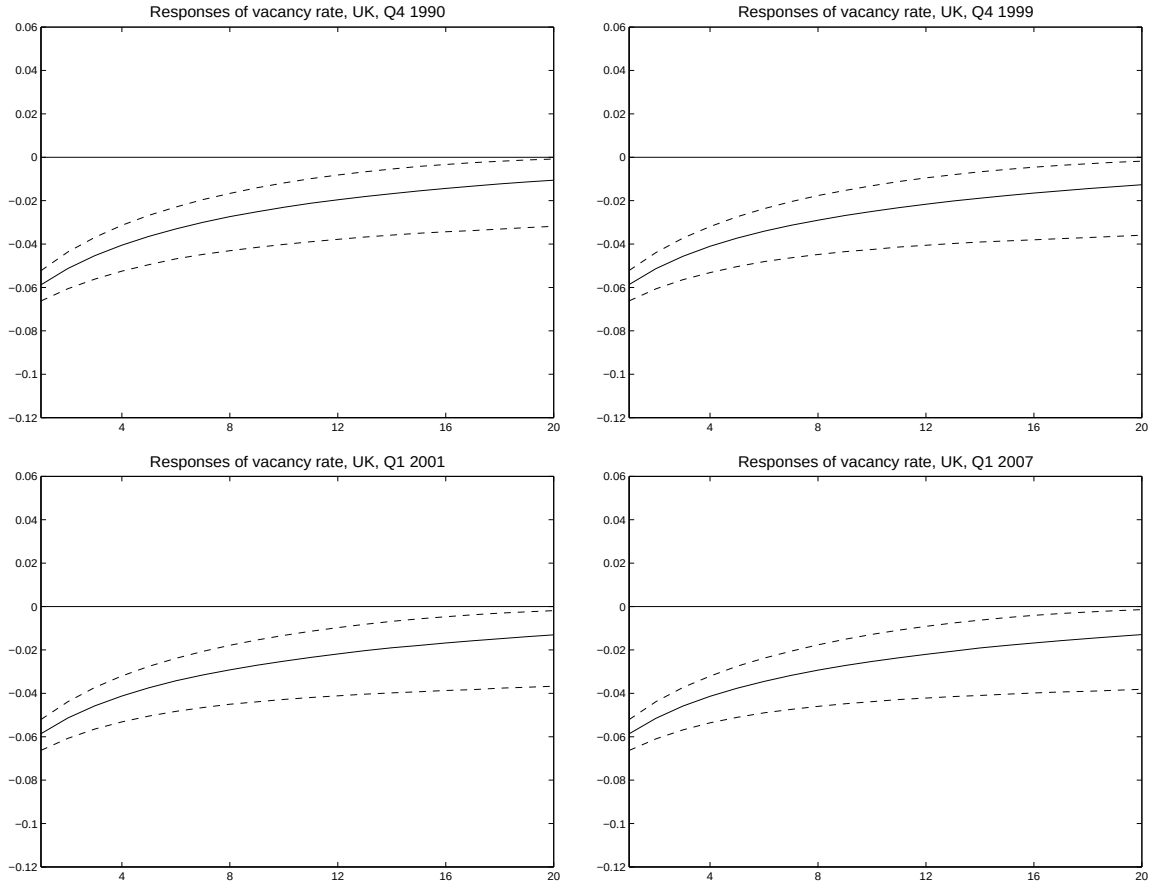


Figure B. 36. Impulse responses of vacancies -*Homo TVP-VAR*, UK

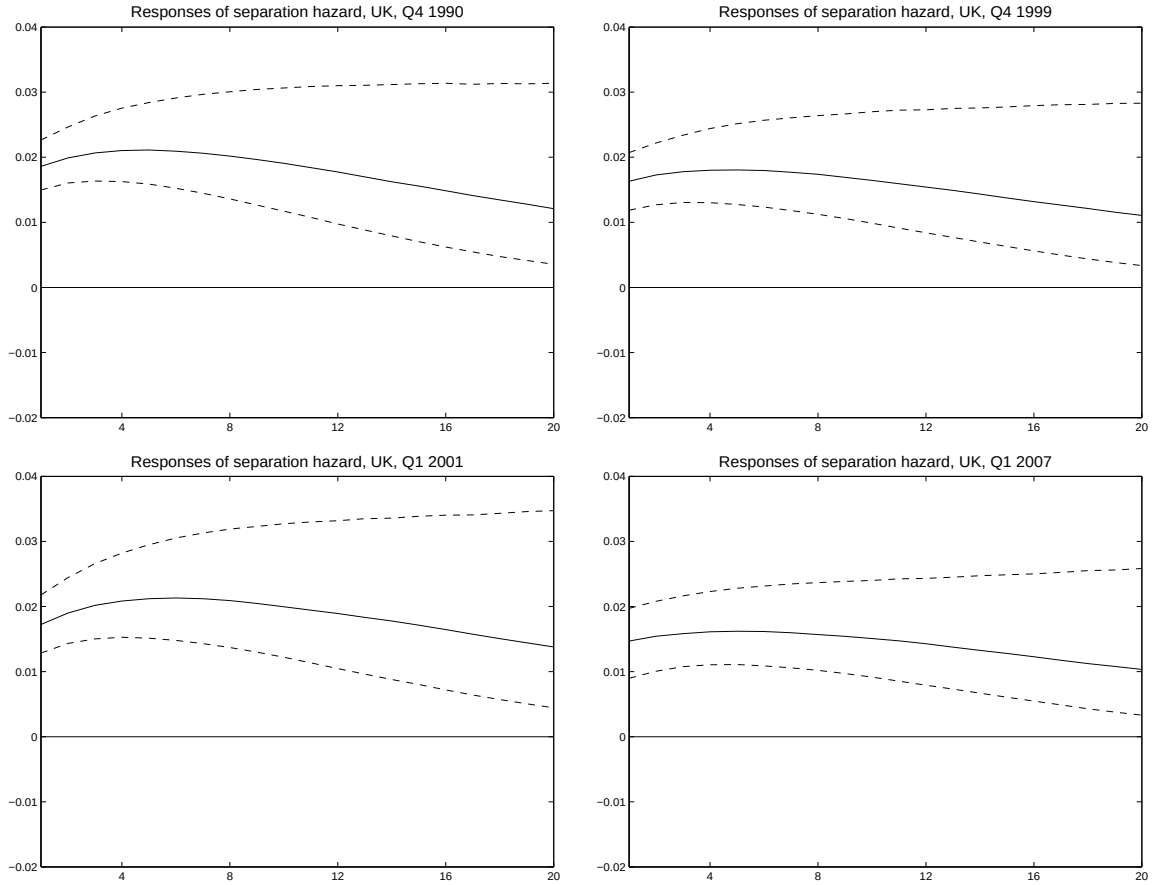


Figure B. 37. Impulse responses of separation hazards -*Hete TVP-VAR*, UK

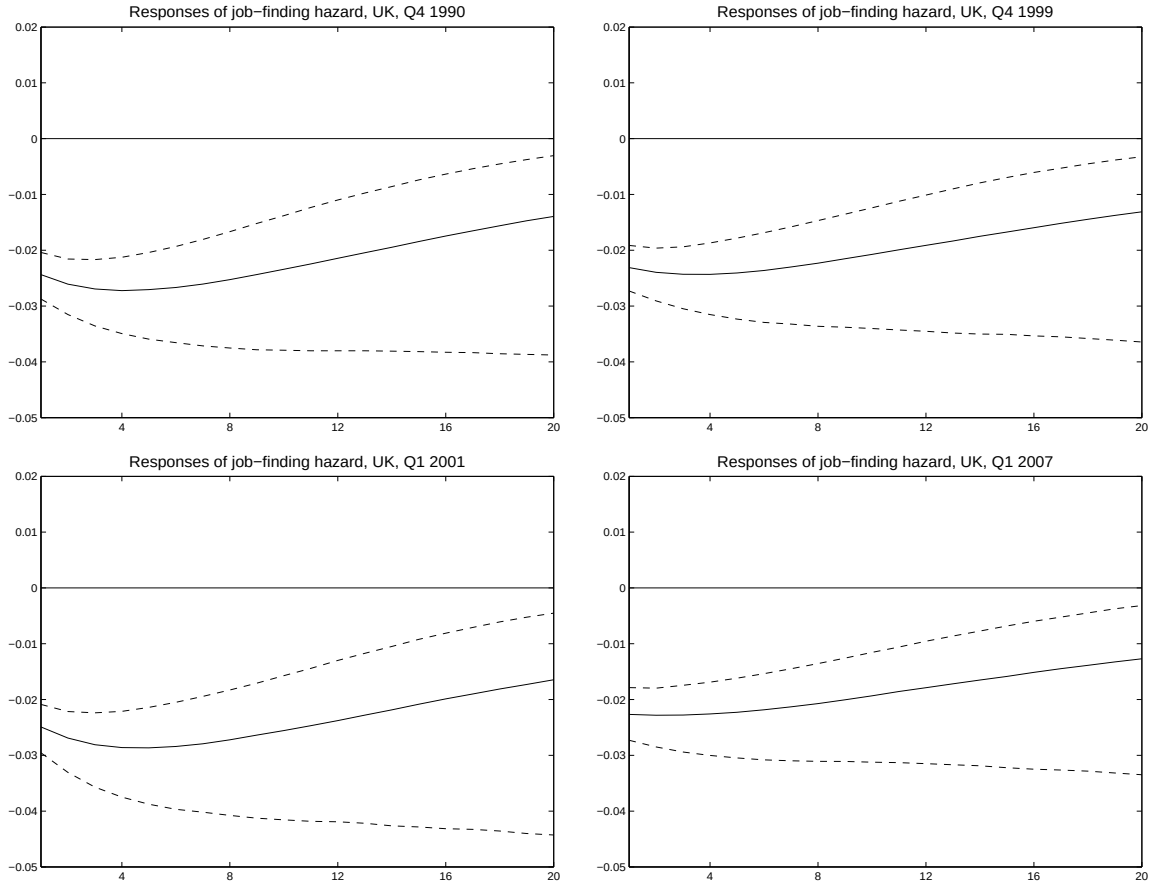


Figure B. 38. Impulse responses of job-finding hazards -*Hete TVP-VAR*, UK

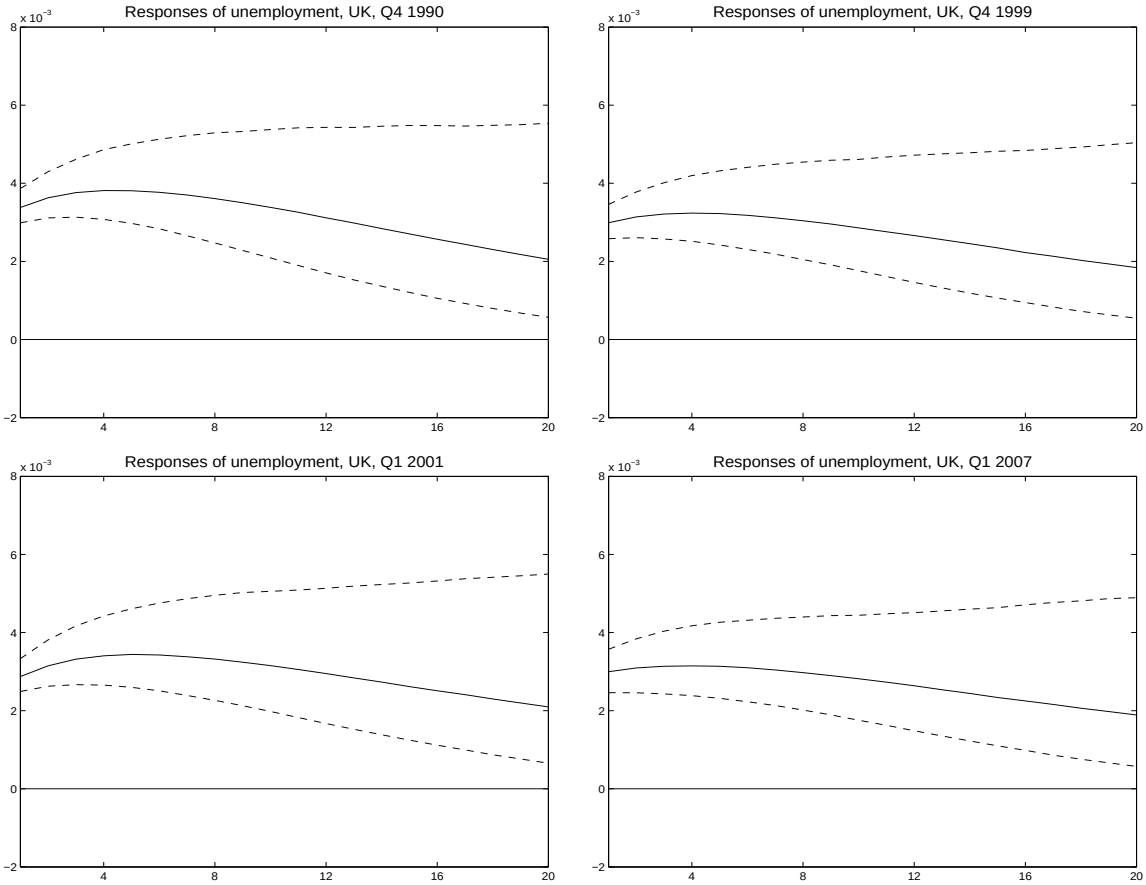


Figure B. 39. Impulse responses of unemployment rates -*Hete TVP-VAR*, UK

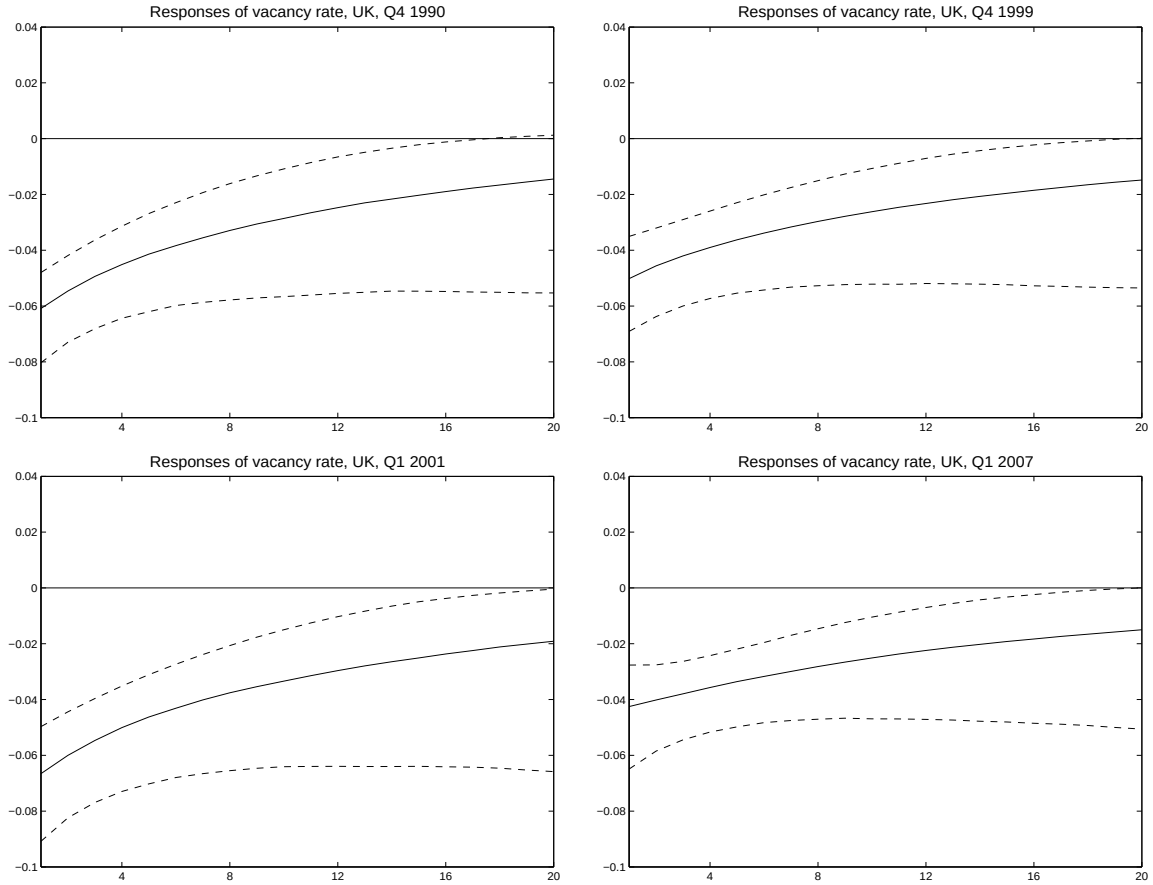


Figure B. 40. Impulse responses of vacancies -*Hete TVP-VAR*, UK

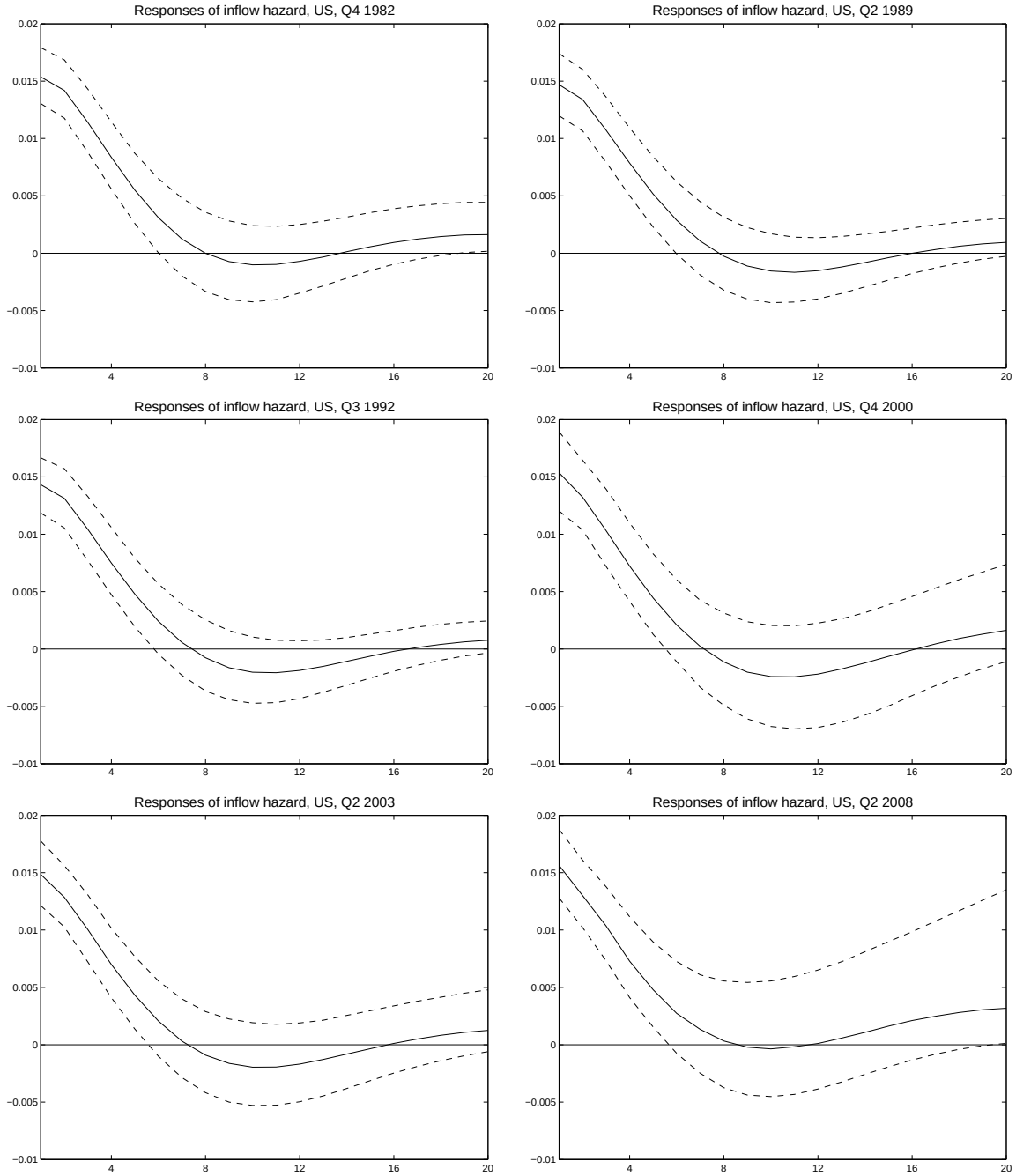


Figure C.1. Impulse responses of separation hazards -*Homo TVP-VAR*, US

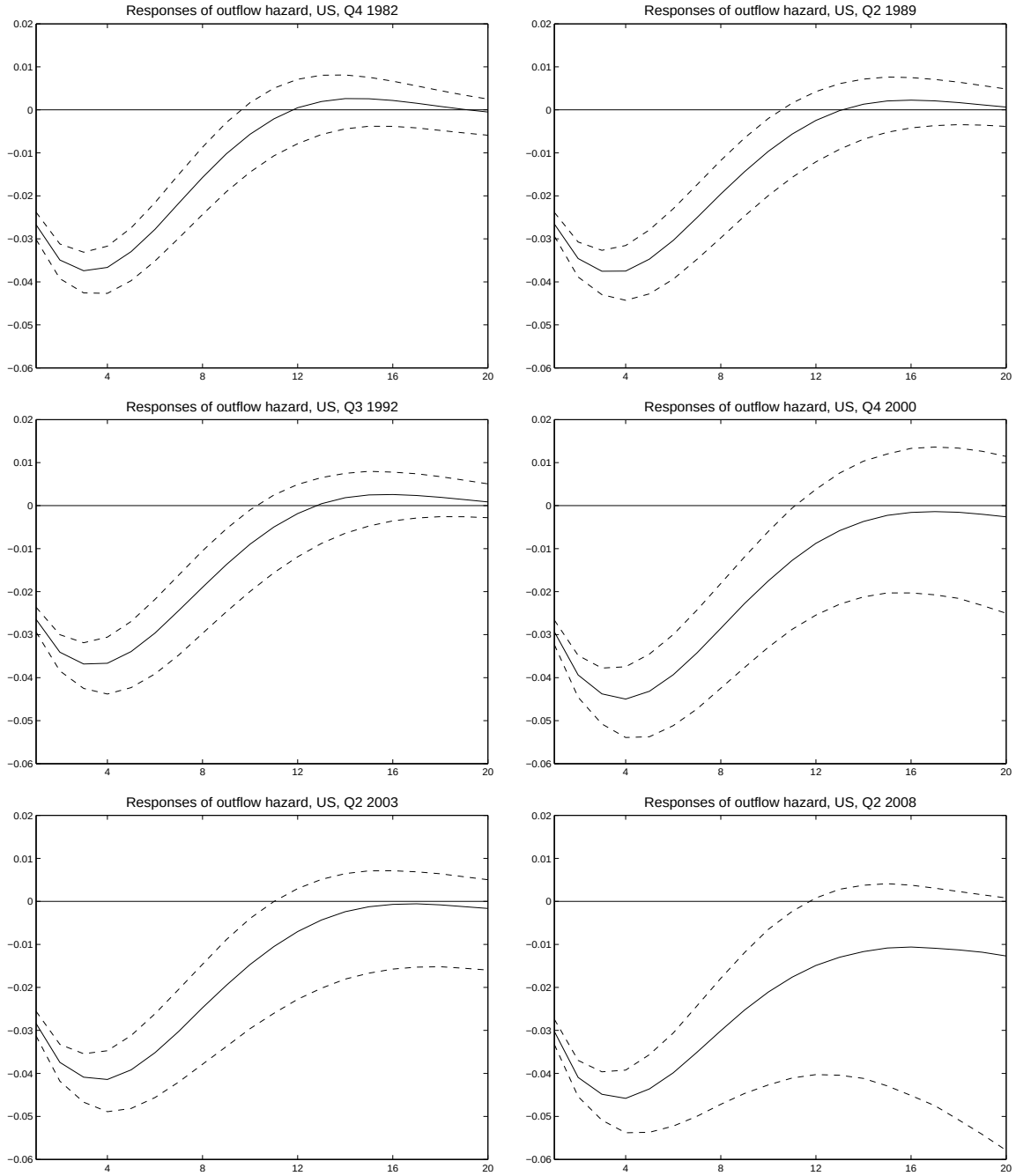


Figure C.2. Impulse responses of job-finding hazards -*Homo TVP-VAR*, US

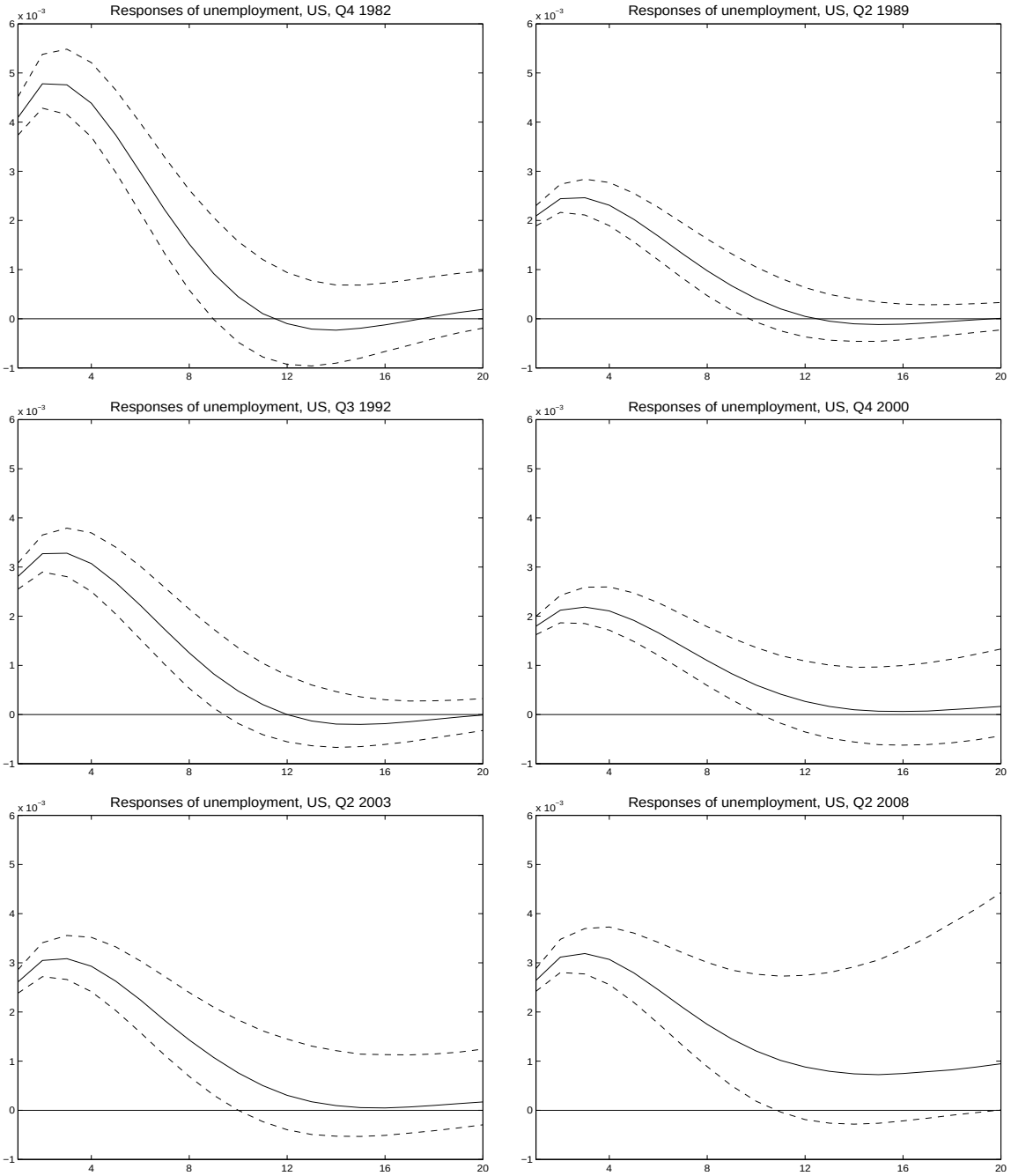


Figure C. 3. Impulse responses of unemployment rates -*Homo TVP-VAR*, US

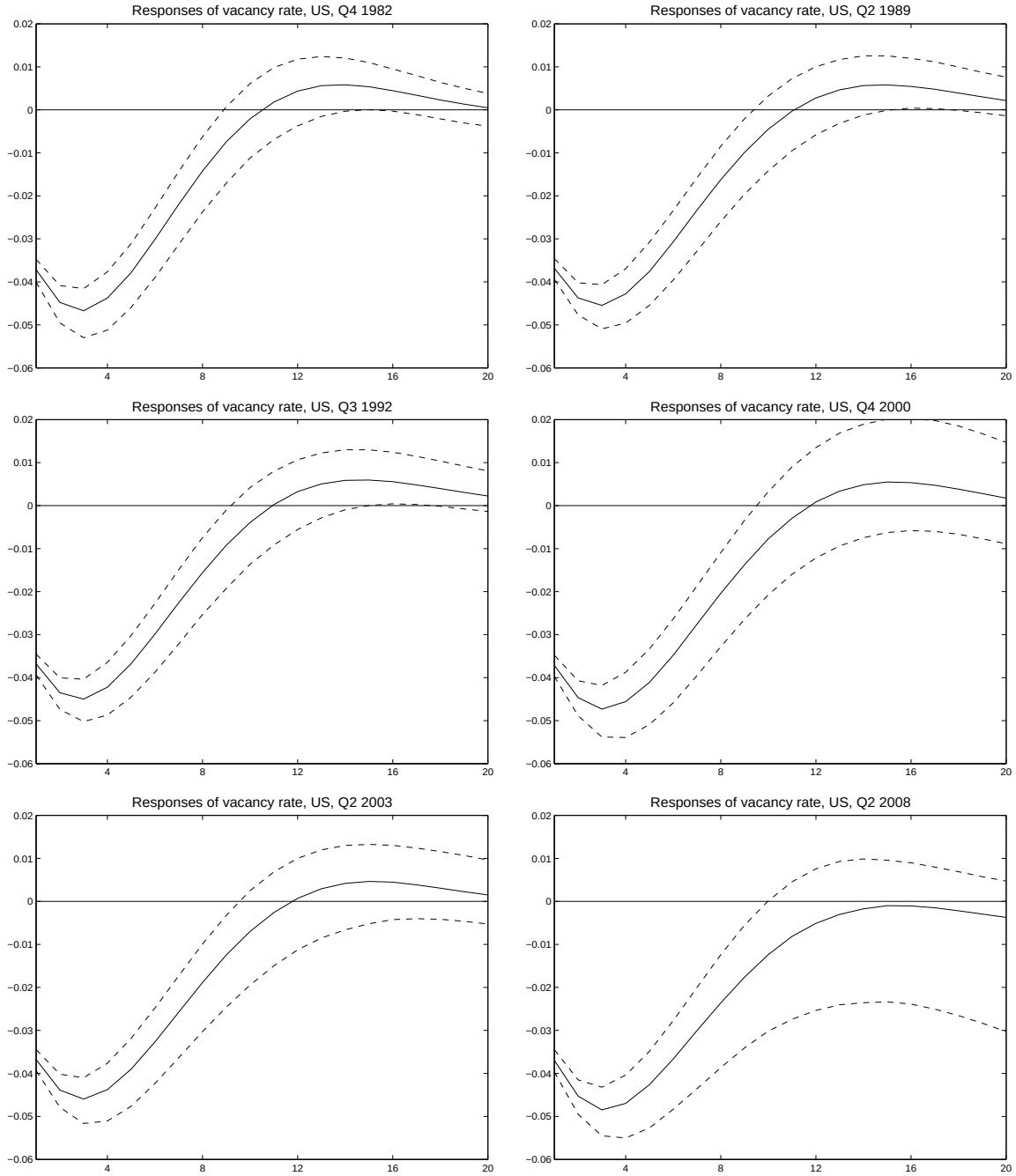


Figure C. 4. Impulse responses of vacancies -*Homo TVP-VAR*, US

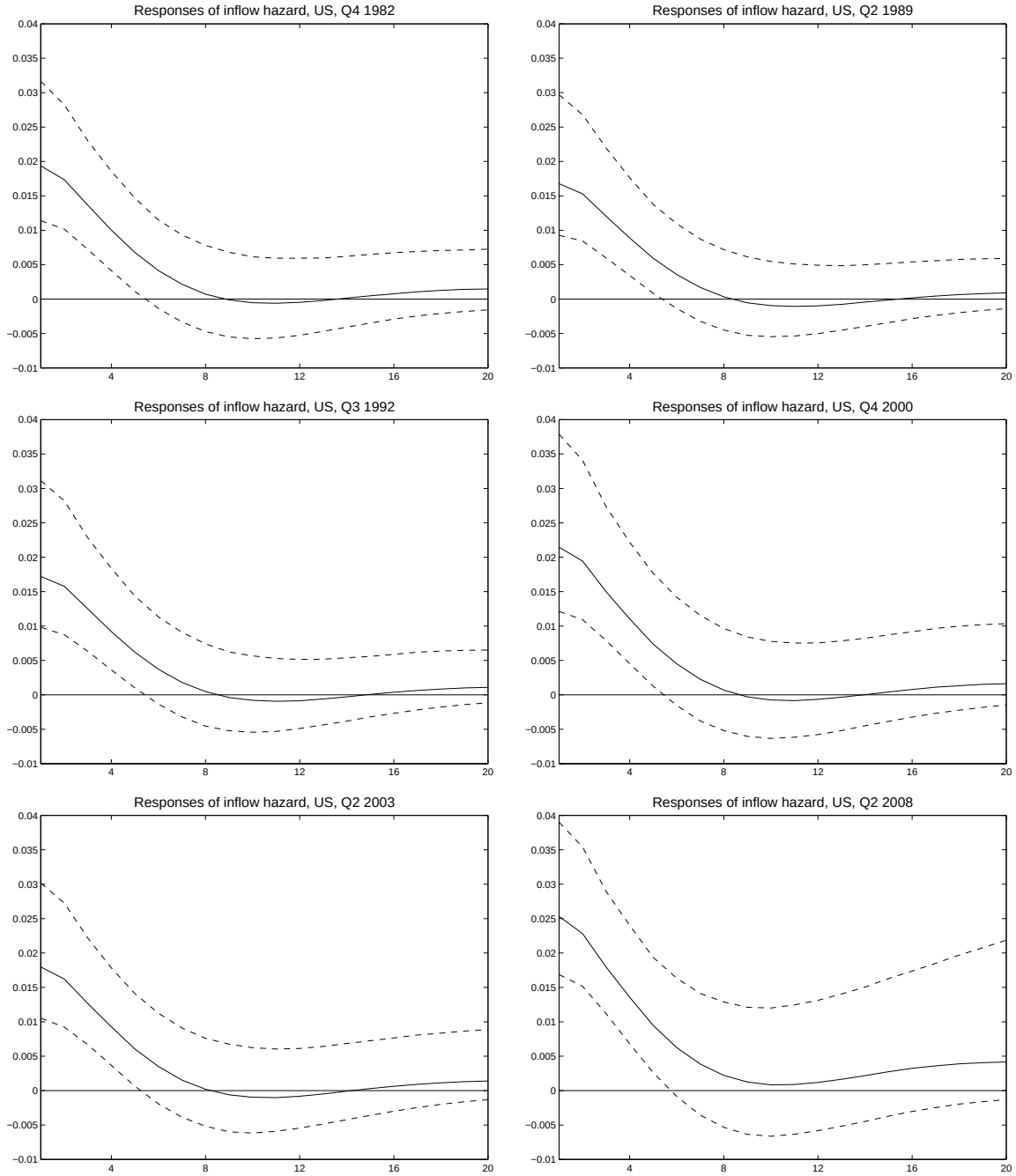


Figure C.5. Impulse responses of separation hazards -*Hete TVP-VAR*, US

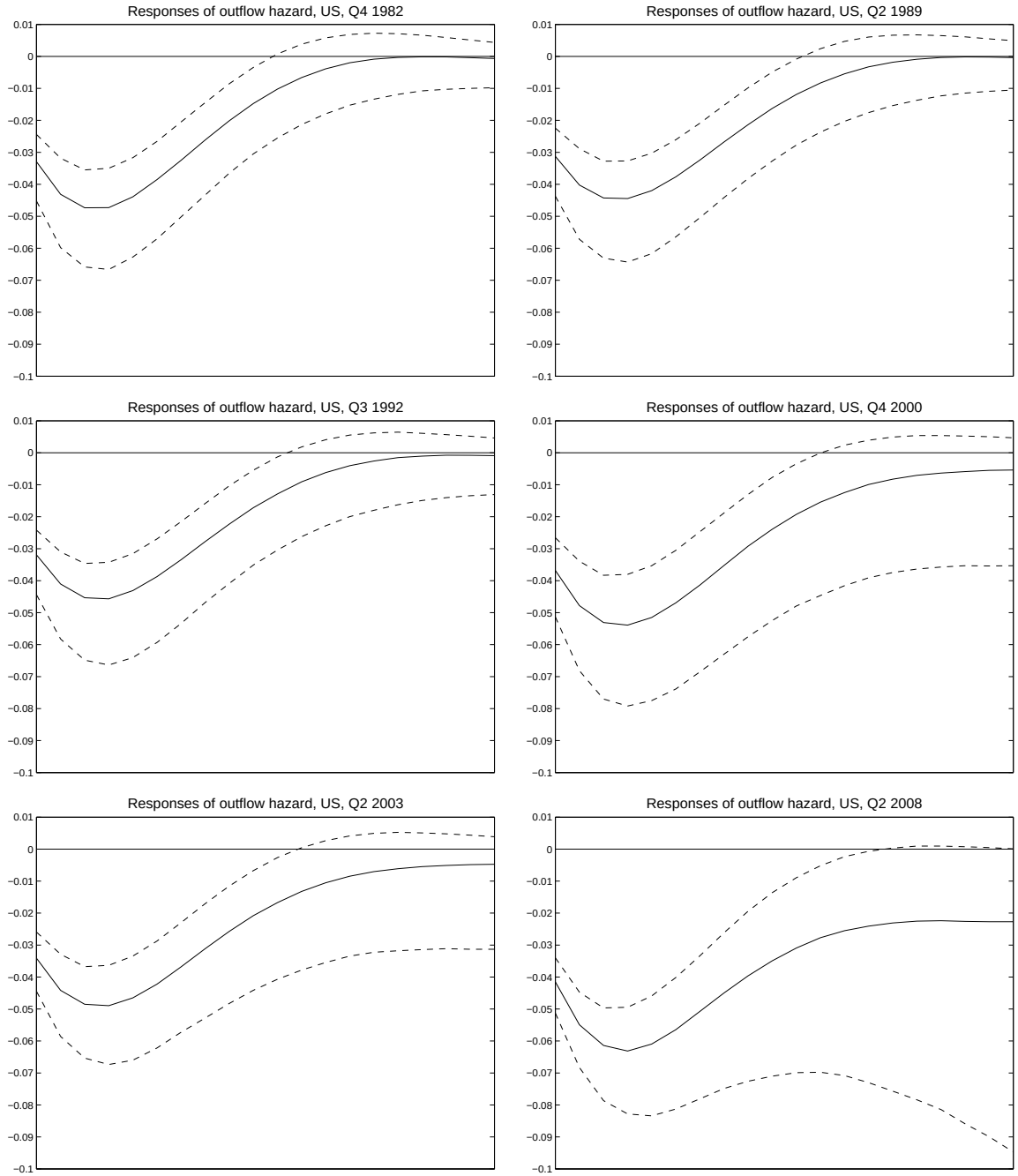


Figure C.6. Impulse responses of job-finding hazards -*Hete TVP-VAR*, US

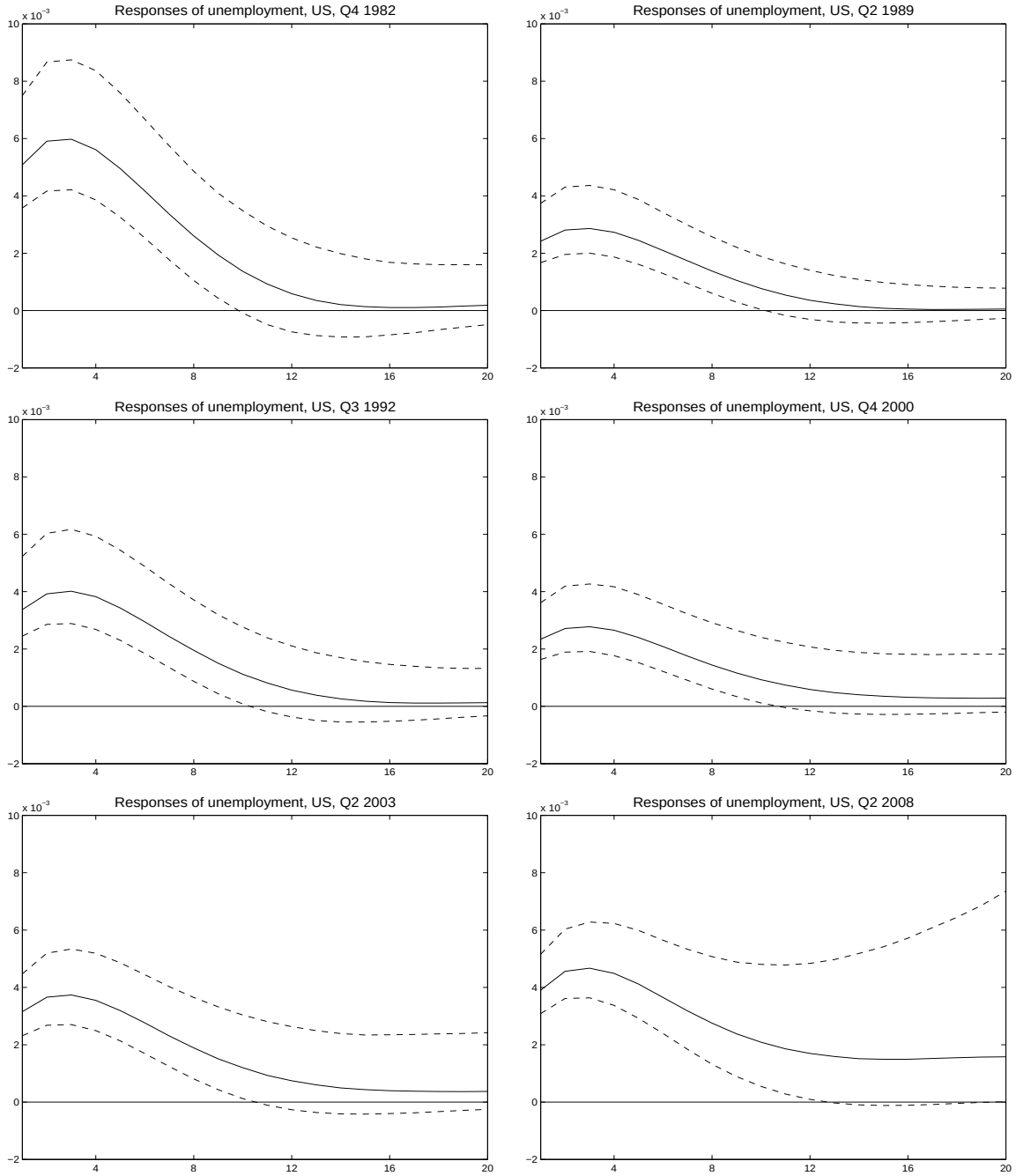


Figure C.7. Impulse responses of unemployment rates -*Hete TVP-VAR*, US

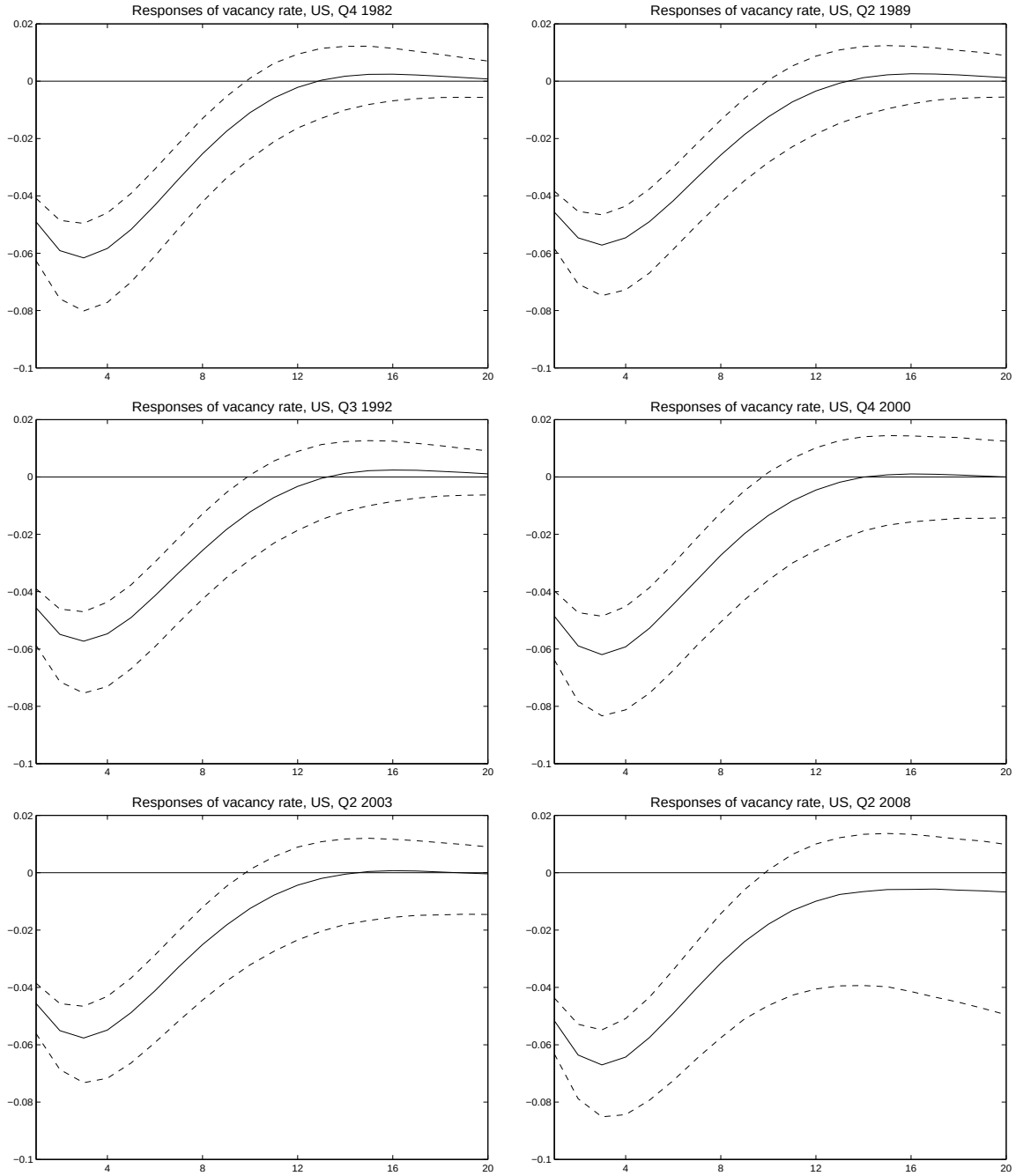


Figure C.8. Impulse responses of vacancies -*Hete TVP-VAR*, US

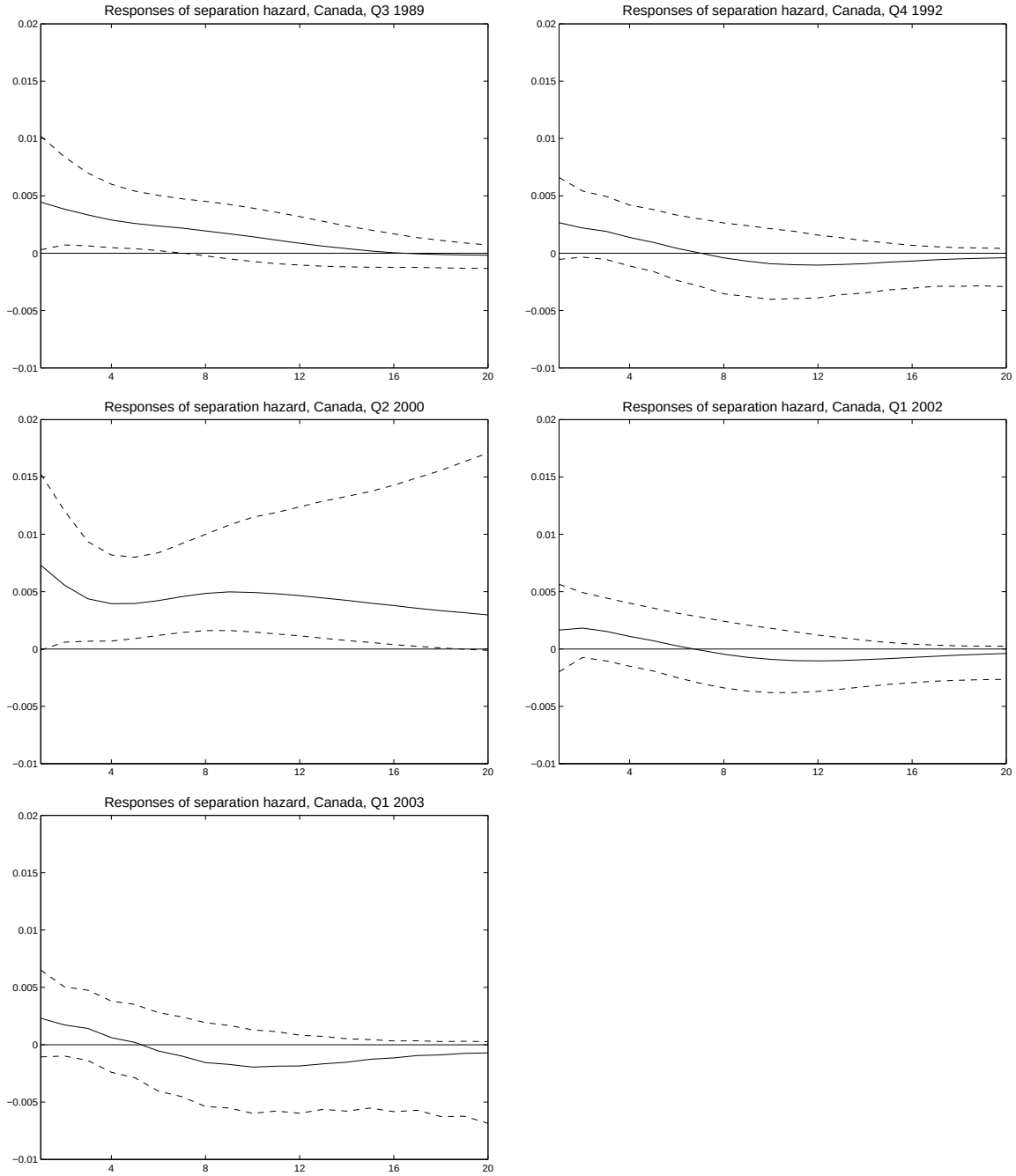


Figure C.9. Impulse responses of separation hazards -*Homo TVP-VAR*, Canada

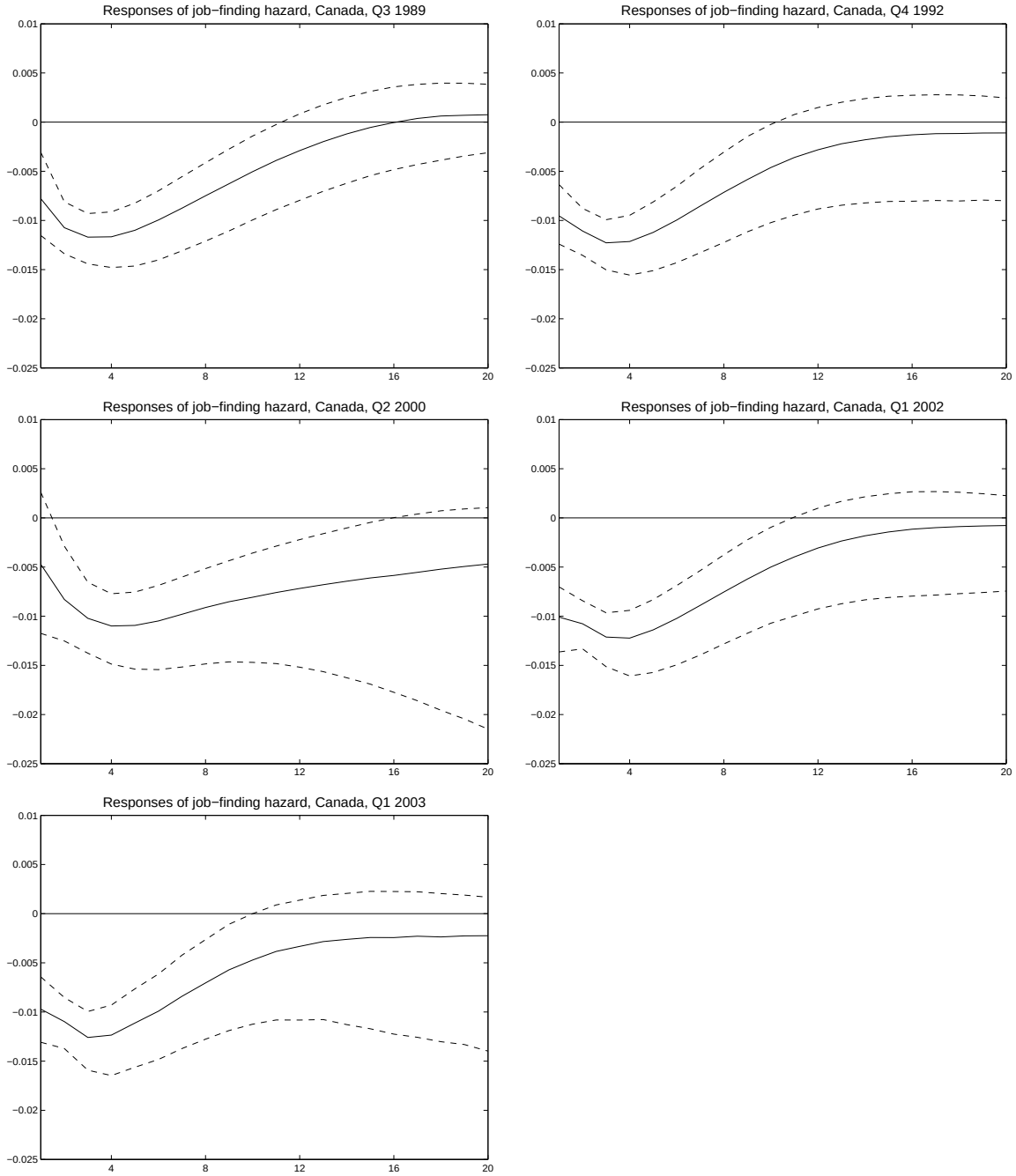


Figure C. 10. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada

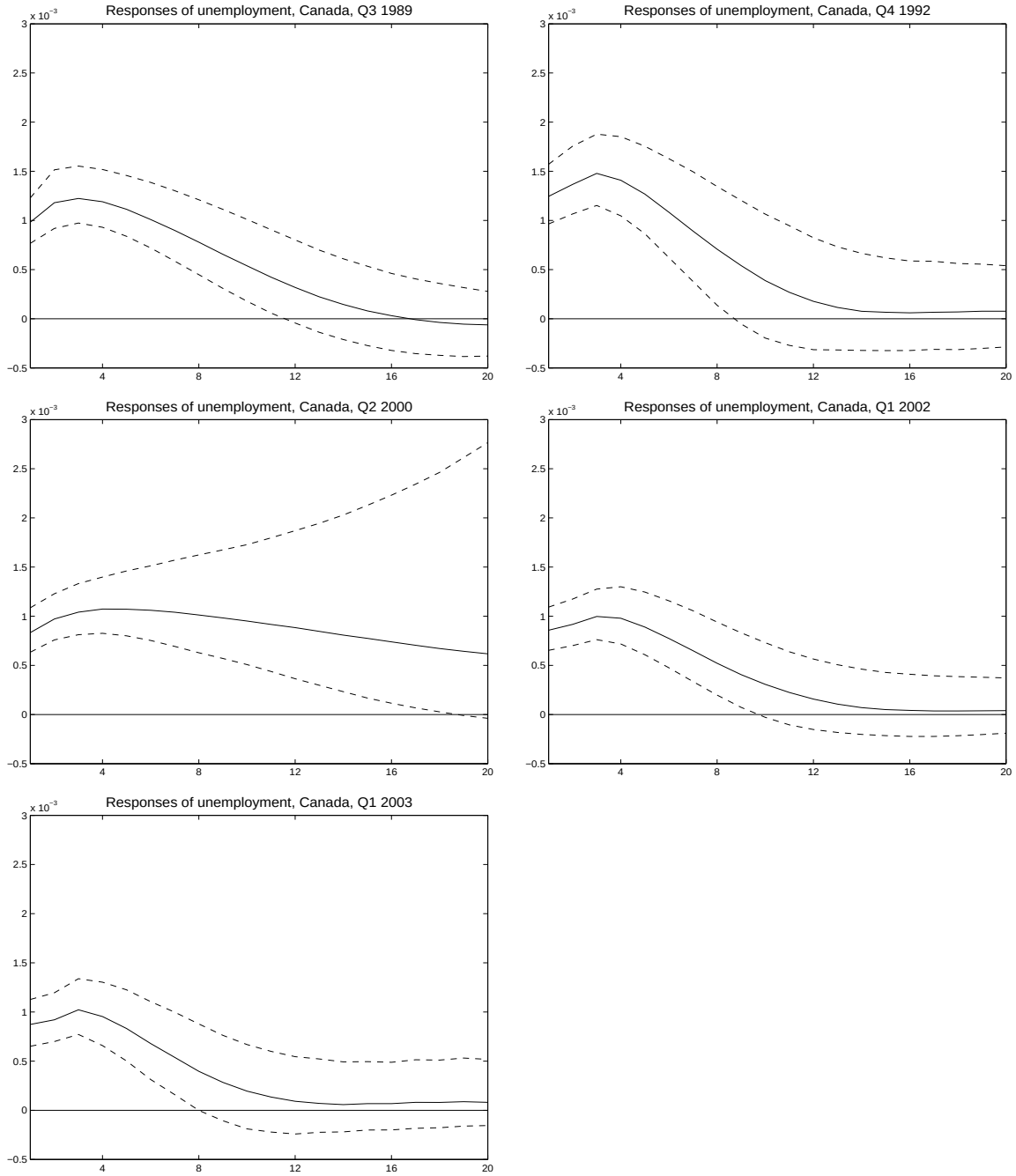


Figure C.11. Impulse responses of unemployment rates -*Homo TVP-VAR*, Canada

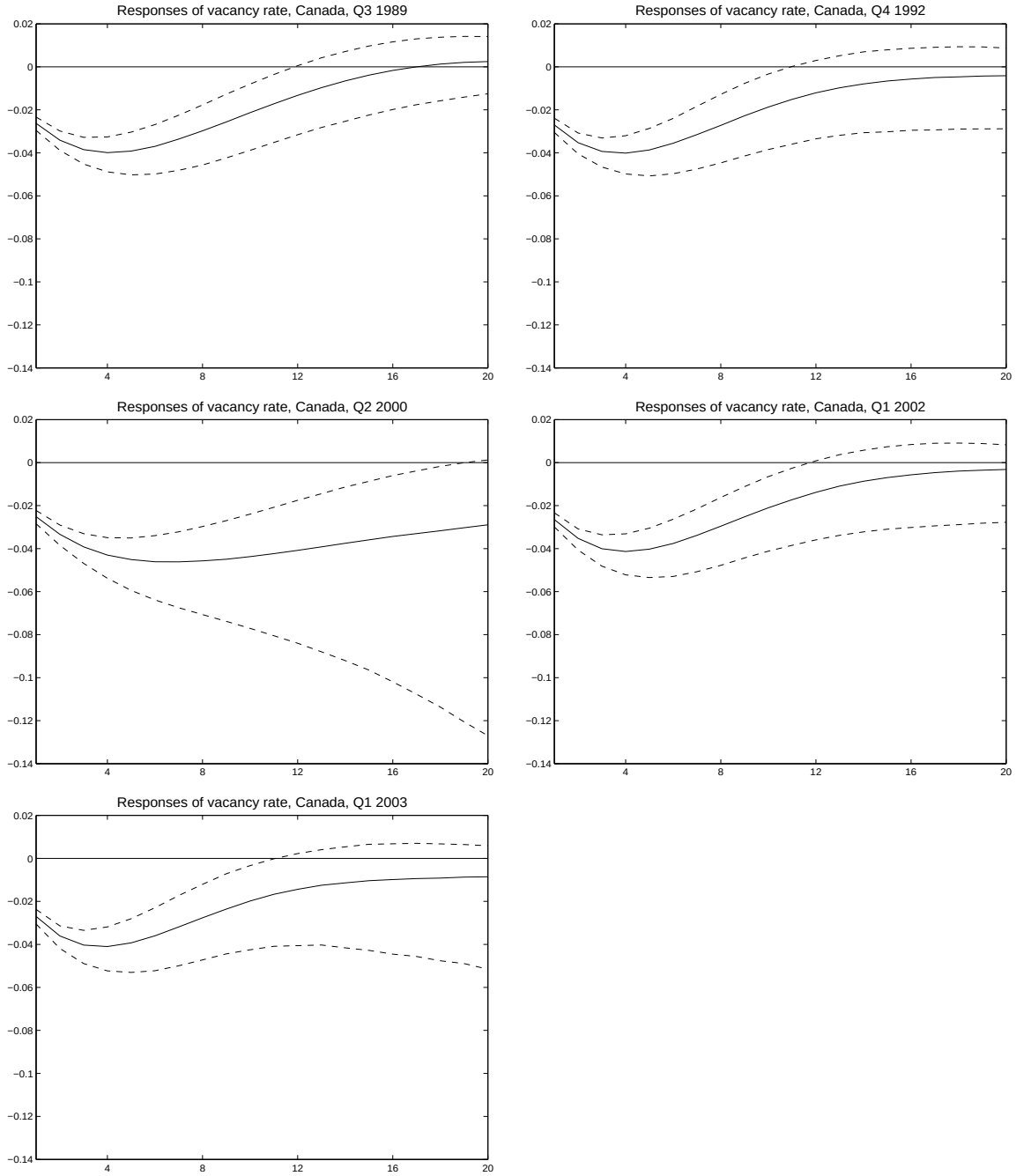


Figure C.12. Impulse responses of vacancies -*Homo TVP-VAR*, Canada

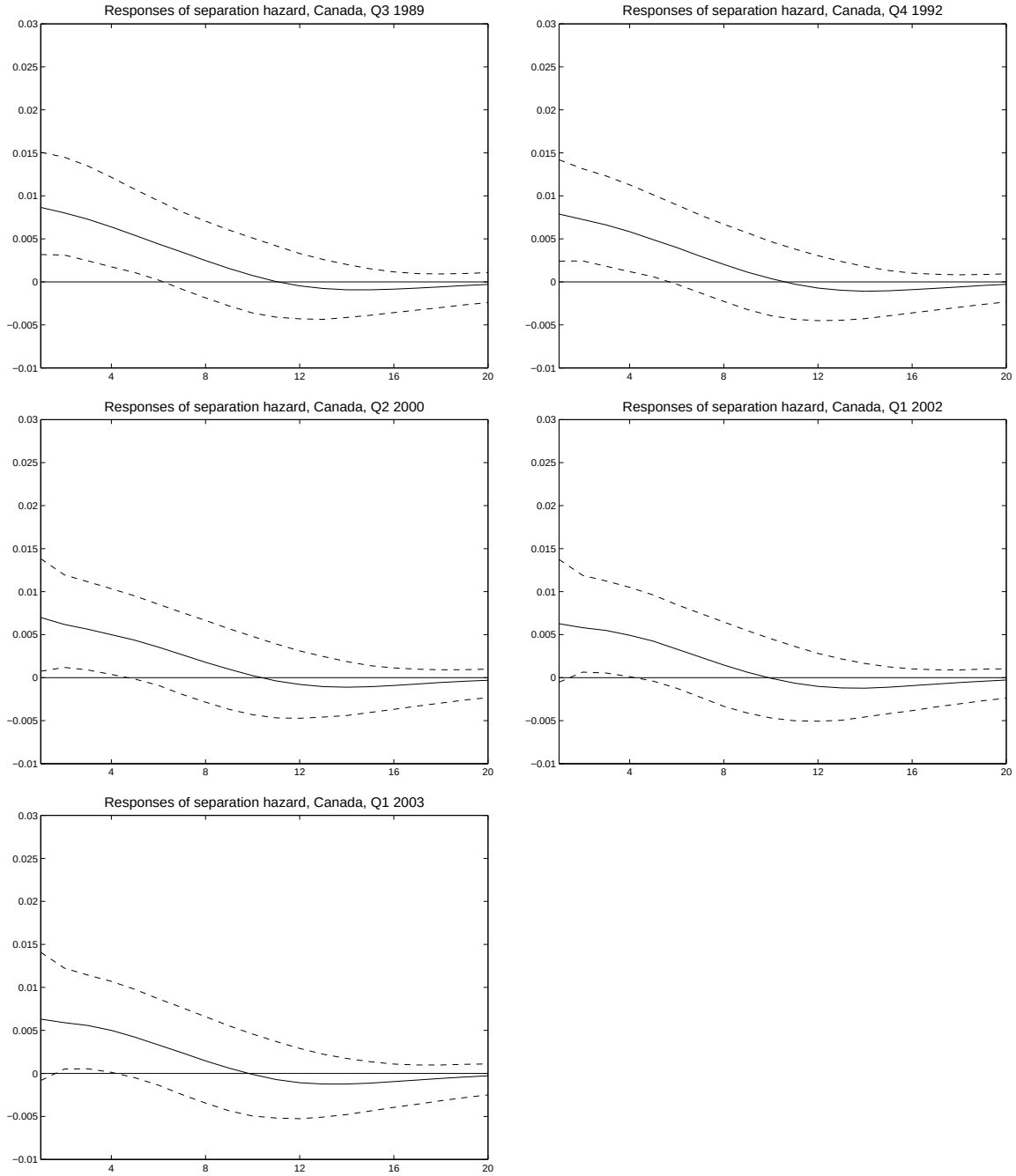


Figure C. 13. Impulse responses of separation hazards -*Hete TVP-VAR*, Canada

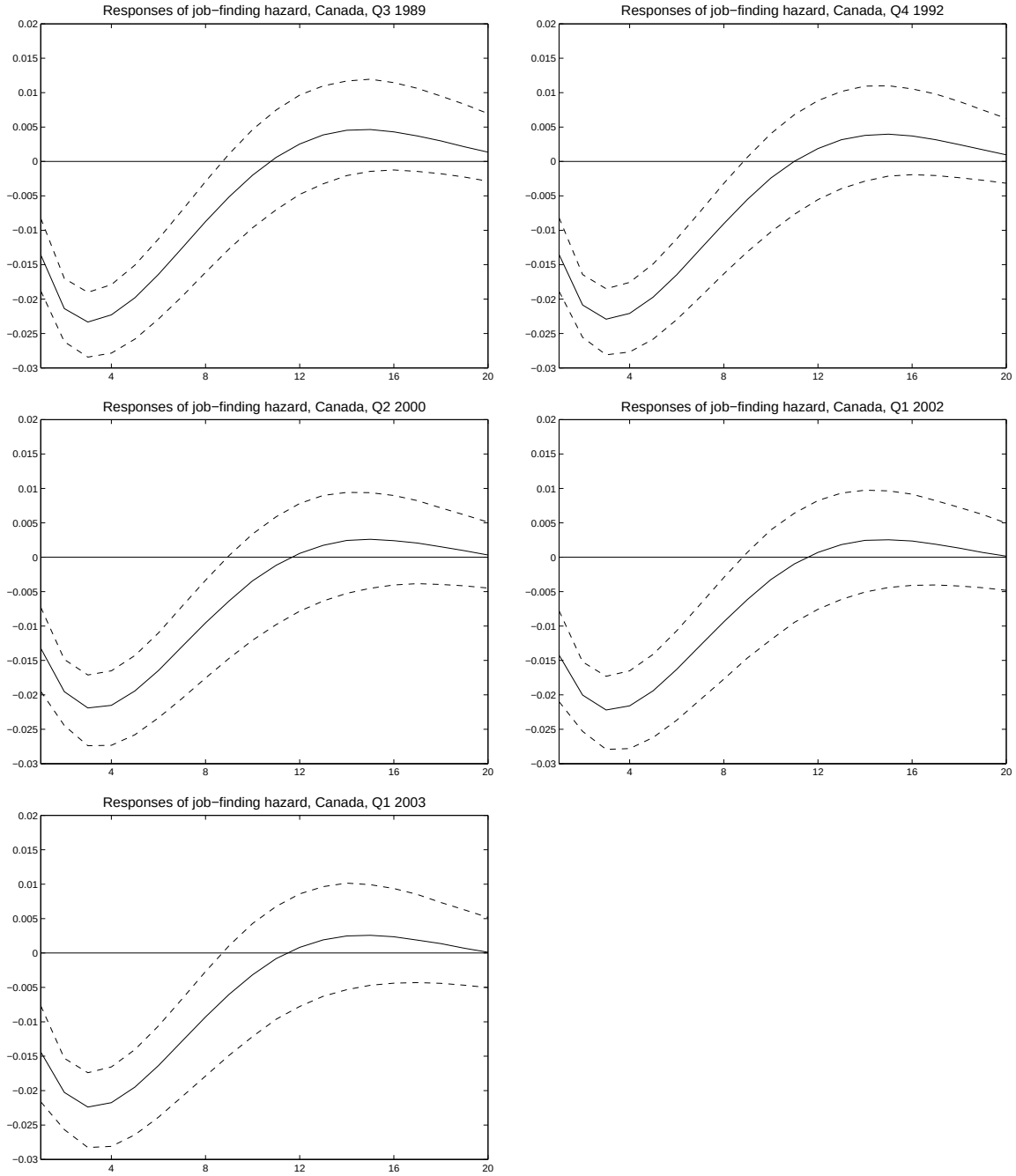


Figure C.14. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Canada

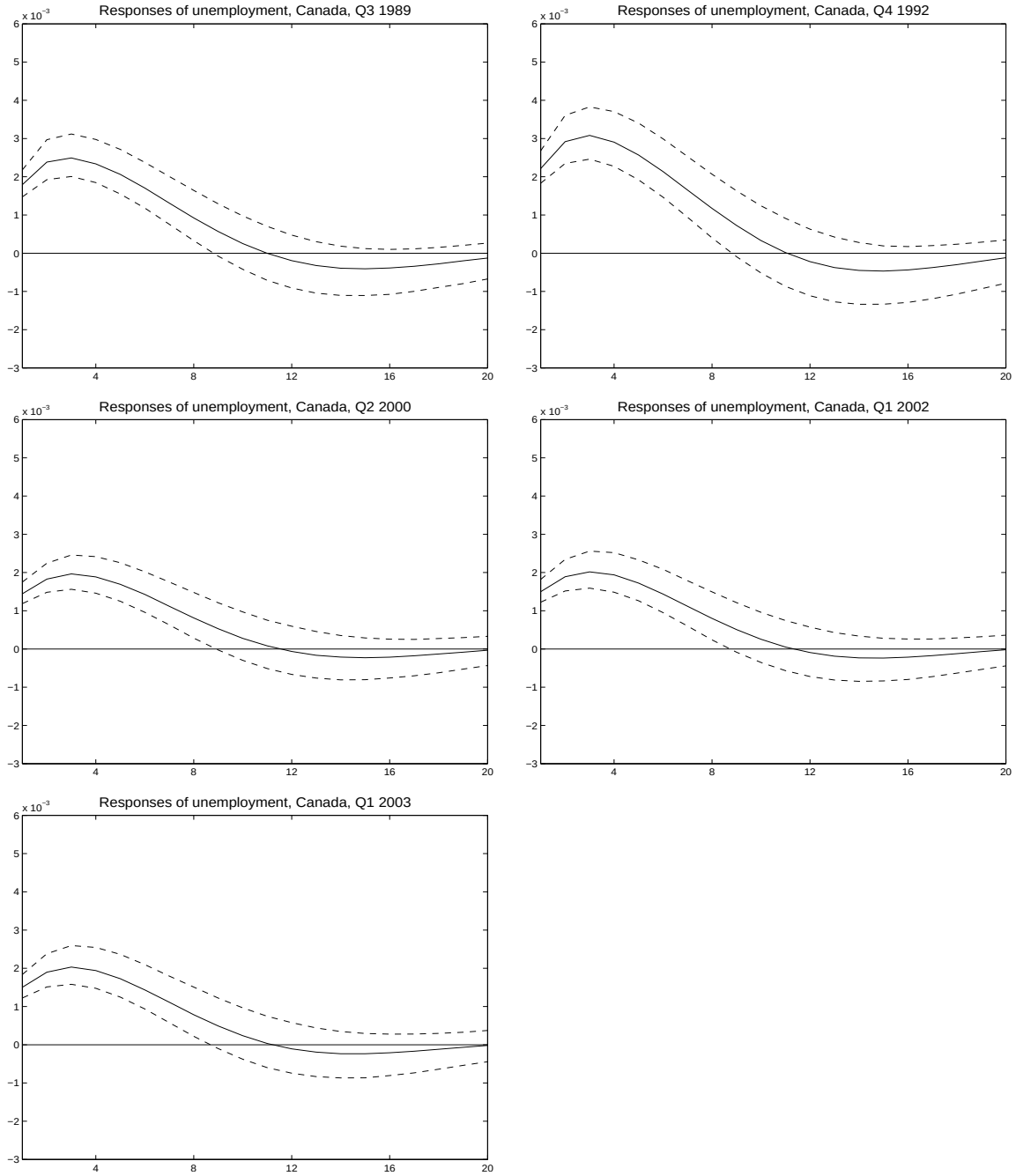


Figure C.15. Impulse responses of unemployment rates -*Hete TVP-VAR*, Canada

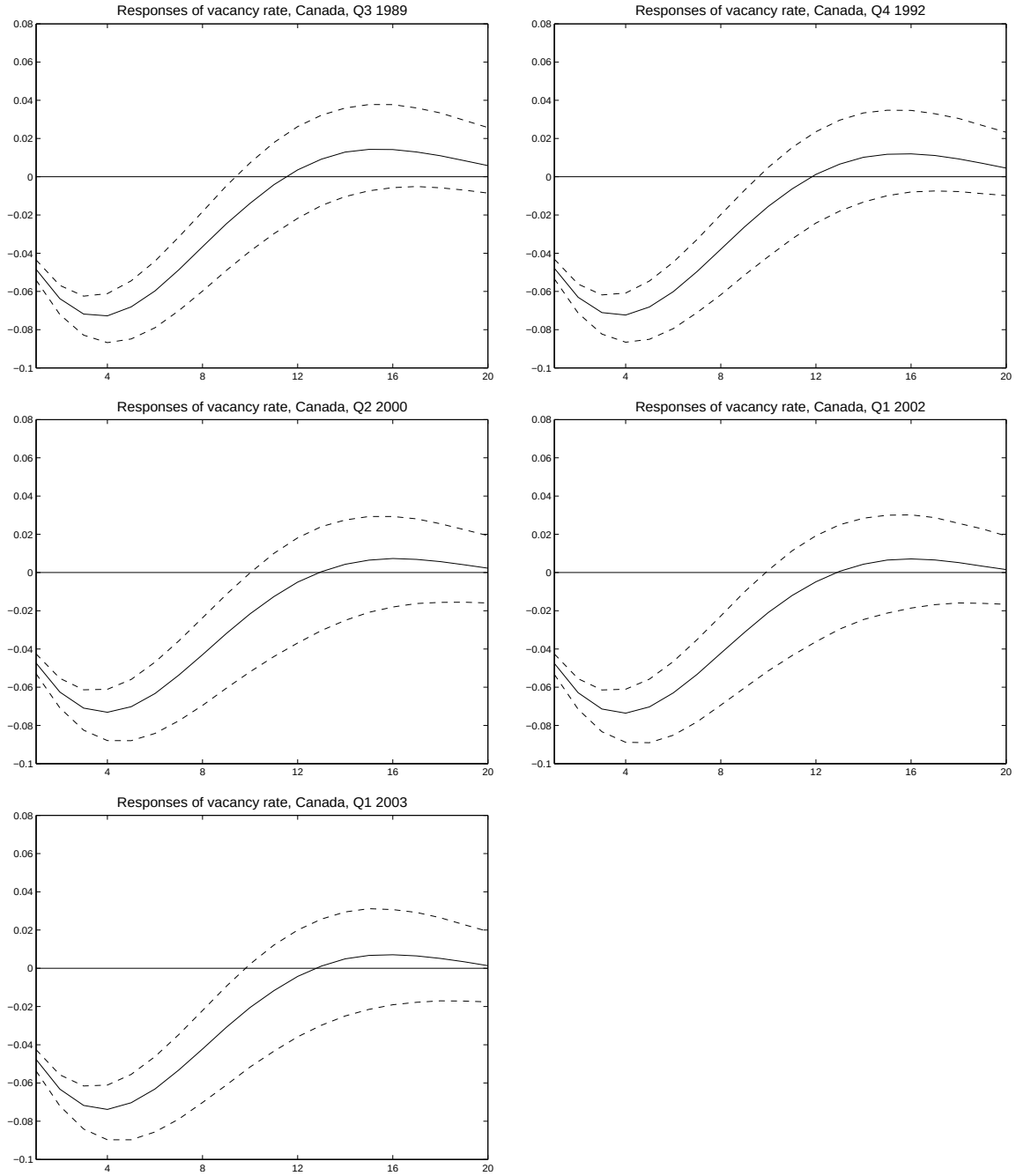


Figure C.16. Impulse responses of vacancies -*Hete TVP-VAR*, Canada

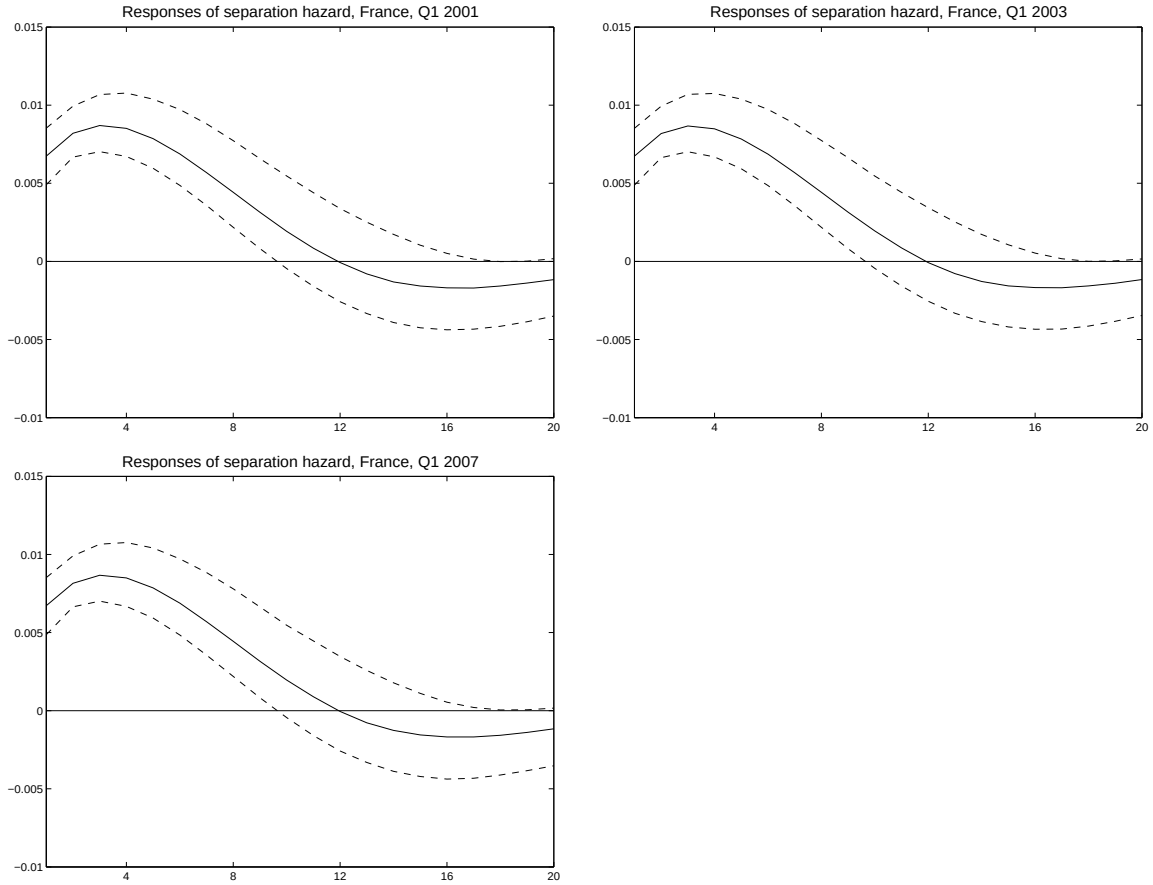


Figure C. 17. Impulse responses of separation hazards -*Homo TVP-VAR*, France

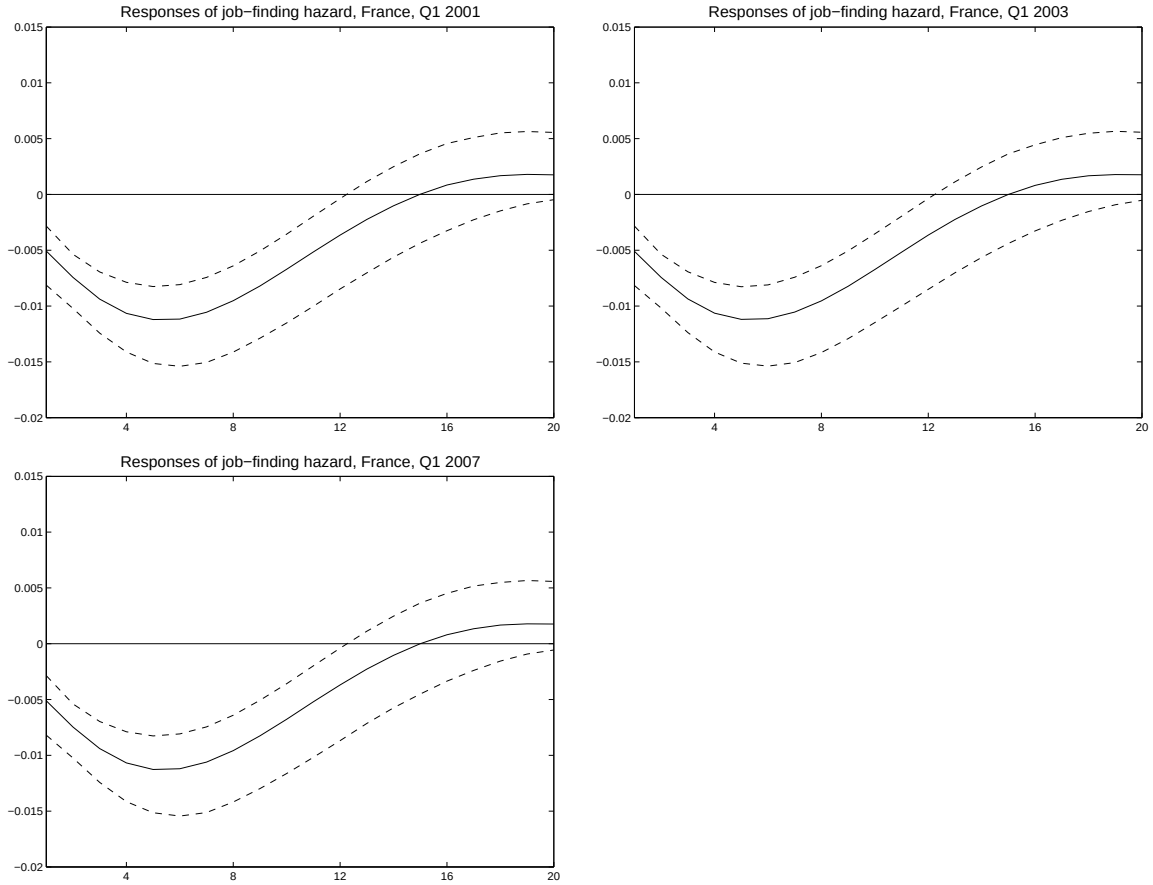


Figure C. 18. Impulse responses of job-finding hazards -*Homo TVP-VAR*, France

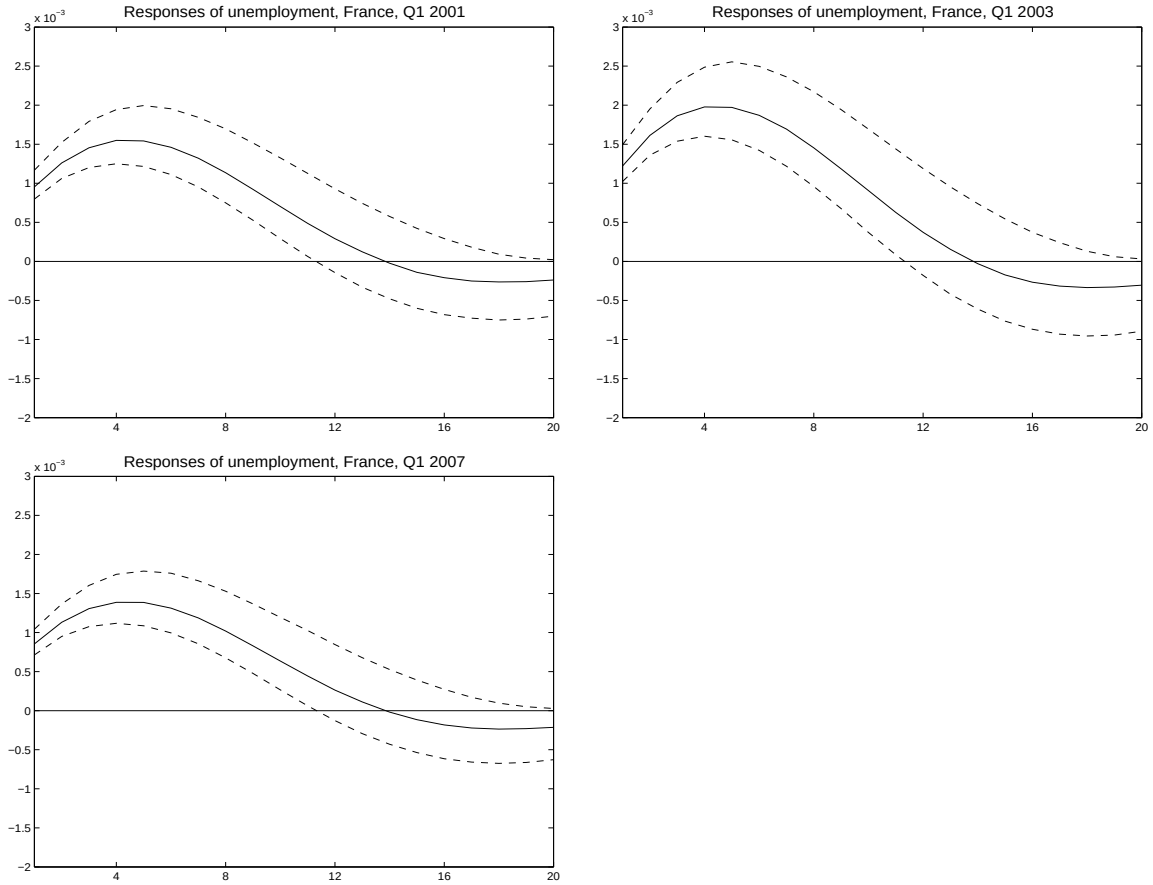


Figure C. 19. Impulse responses of unemployment rates -*Homo TVP-VAR*, France

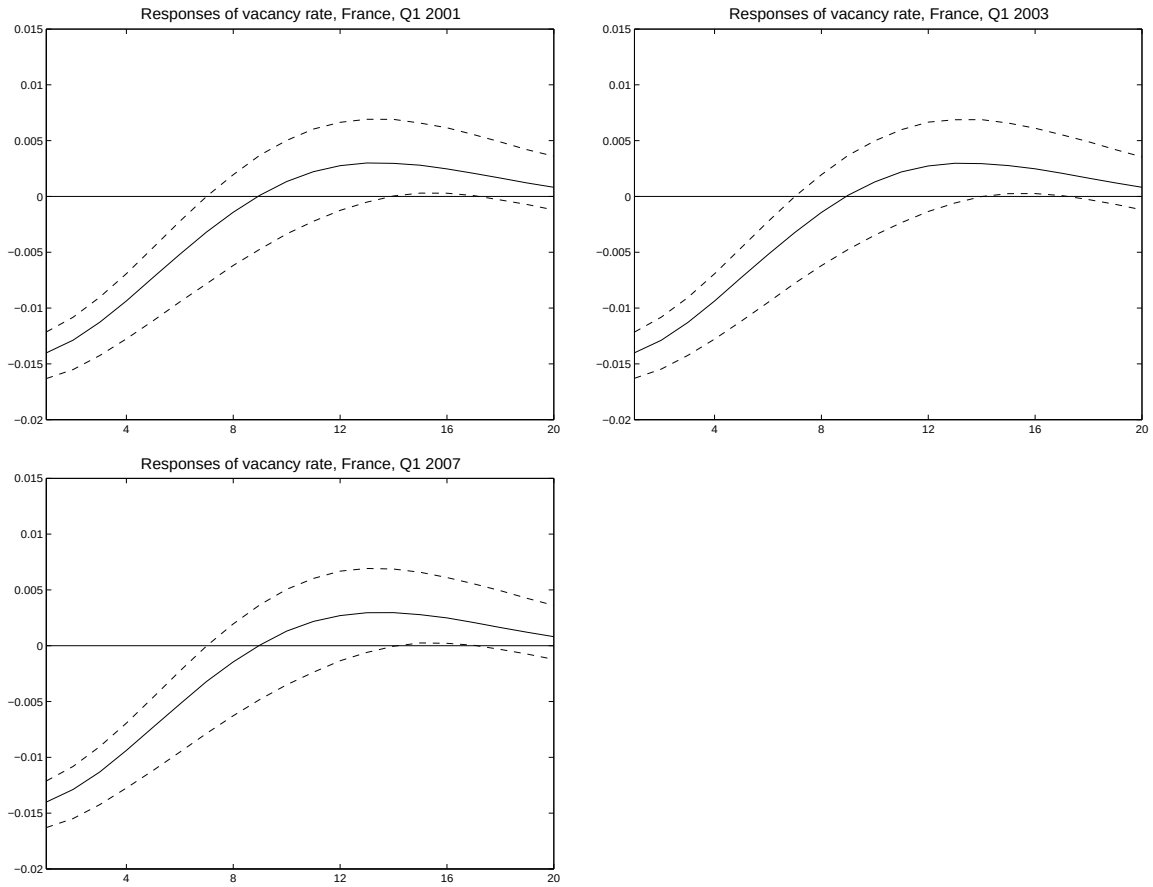


Figure C. 20. Impulse responses of vacancies -*Homo TVP-VAR*, France

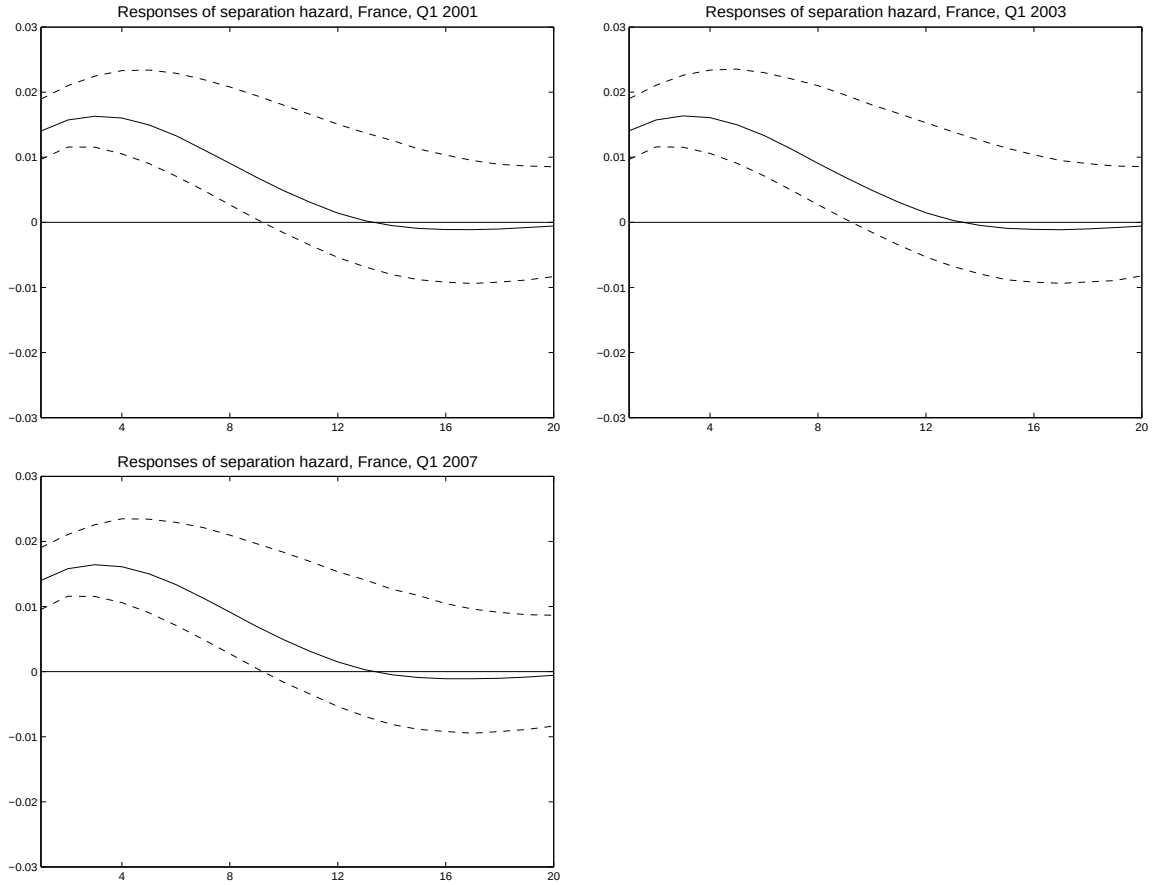


Figure C. 21. Impulse responses of separation hazards -*Hete TVP-VAR*, France

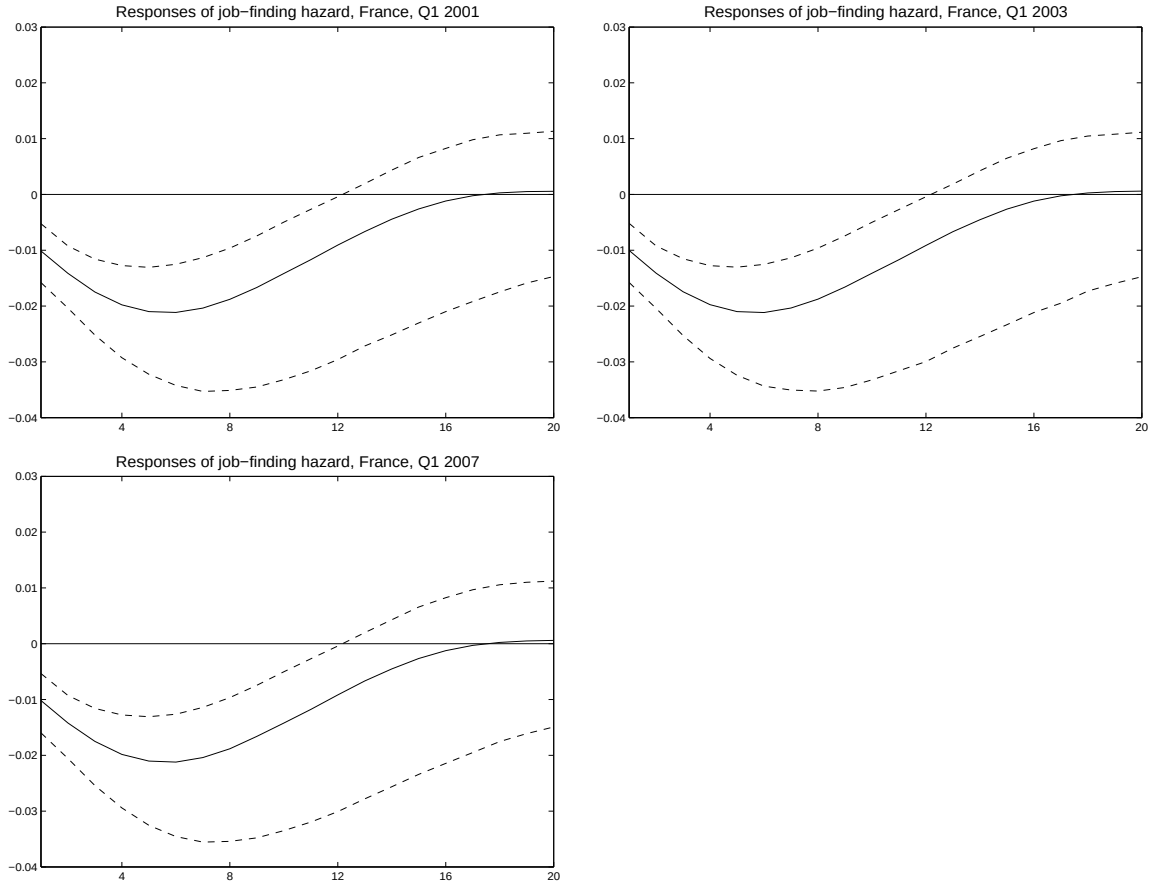


Figure C. 22. Impulse responses of job-finding hazards -*Hete TVP-VAR*, France

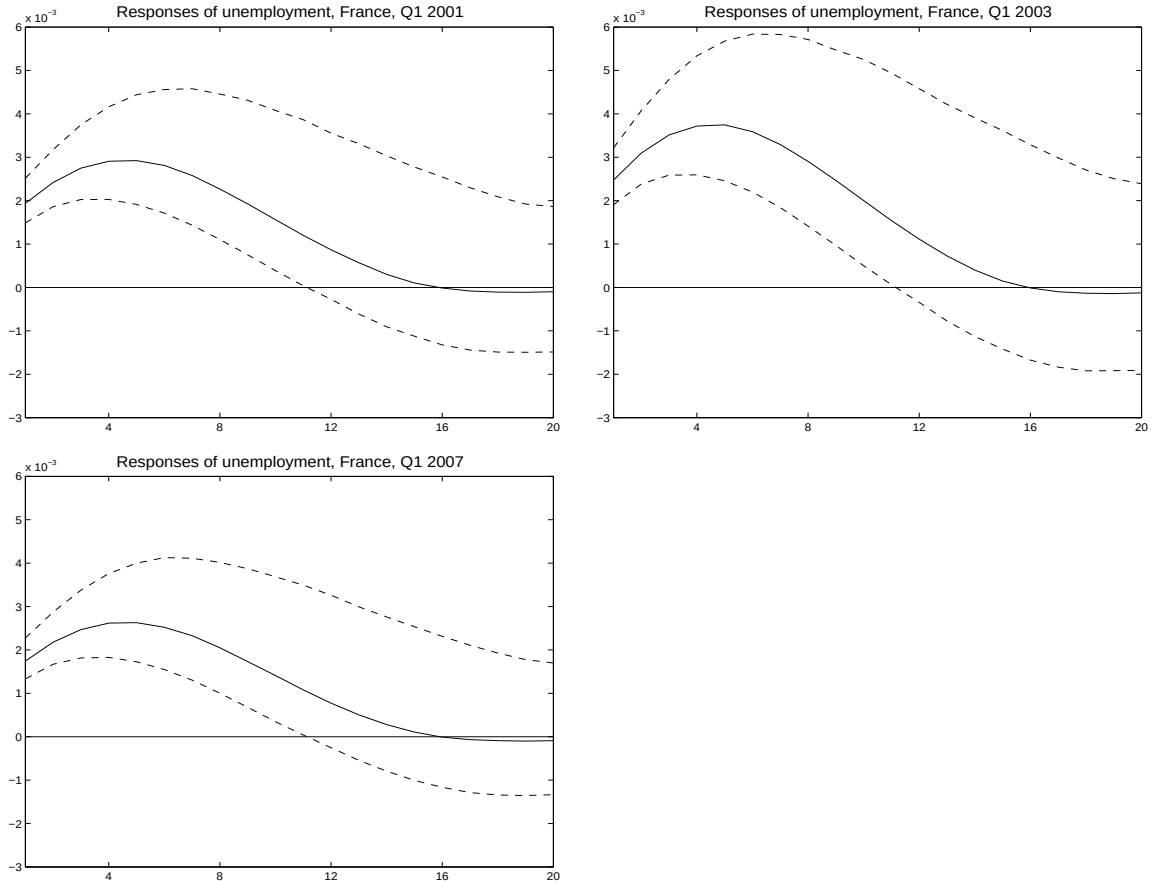


Figure C. 23. Impulse responses of unemployment rates -*Hete TVP-VAR*, France

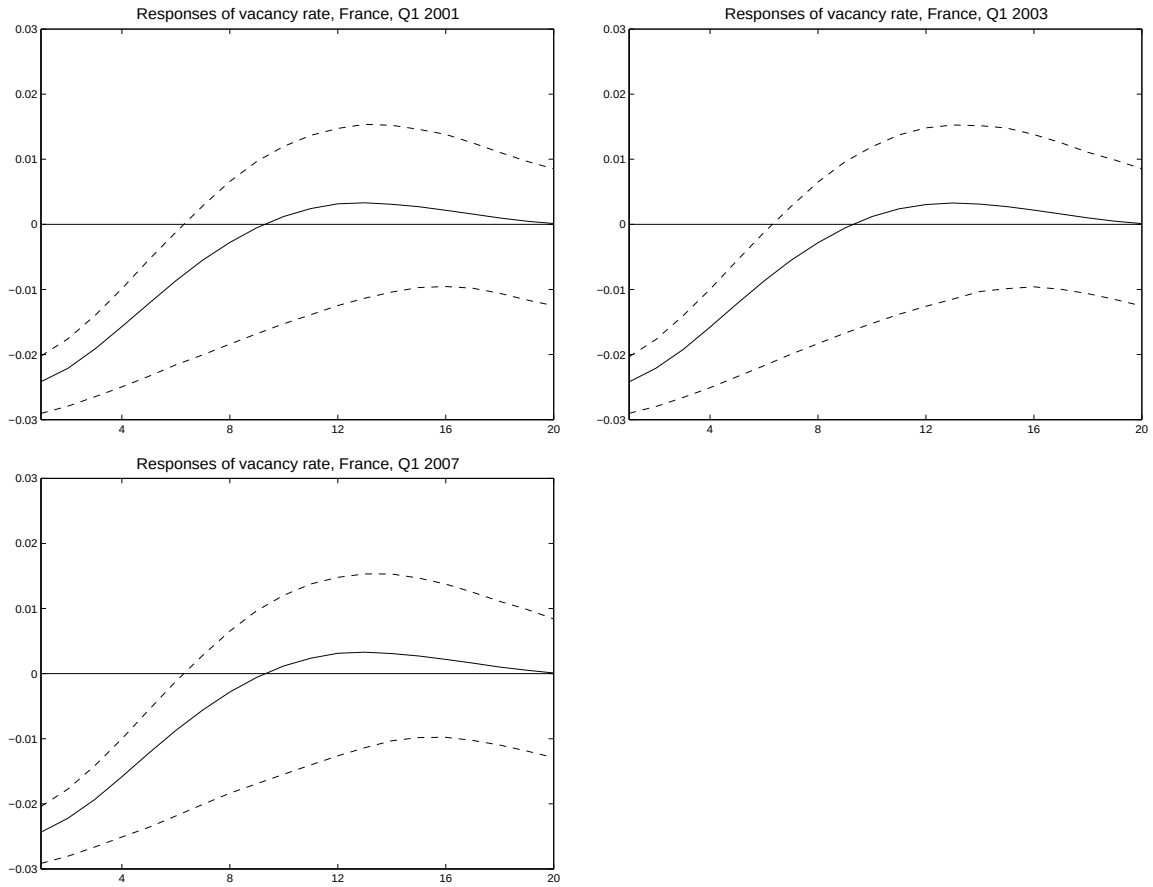


Figure C. 24. Impulse responses of vacancies -*Hete TVP-VAR*, France

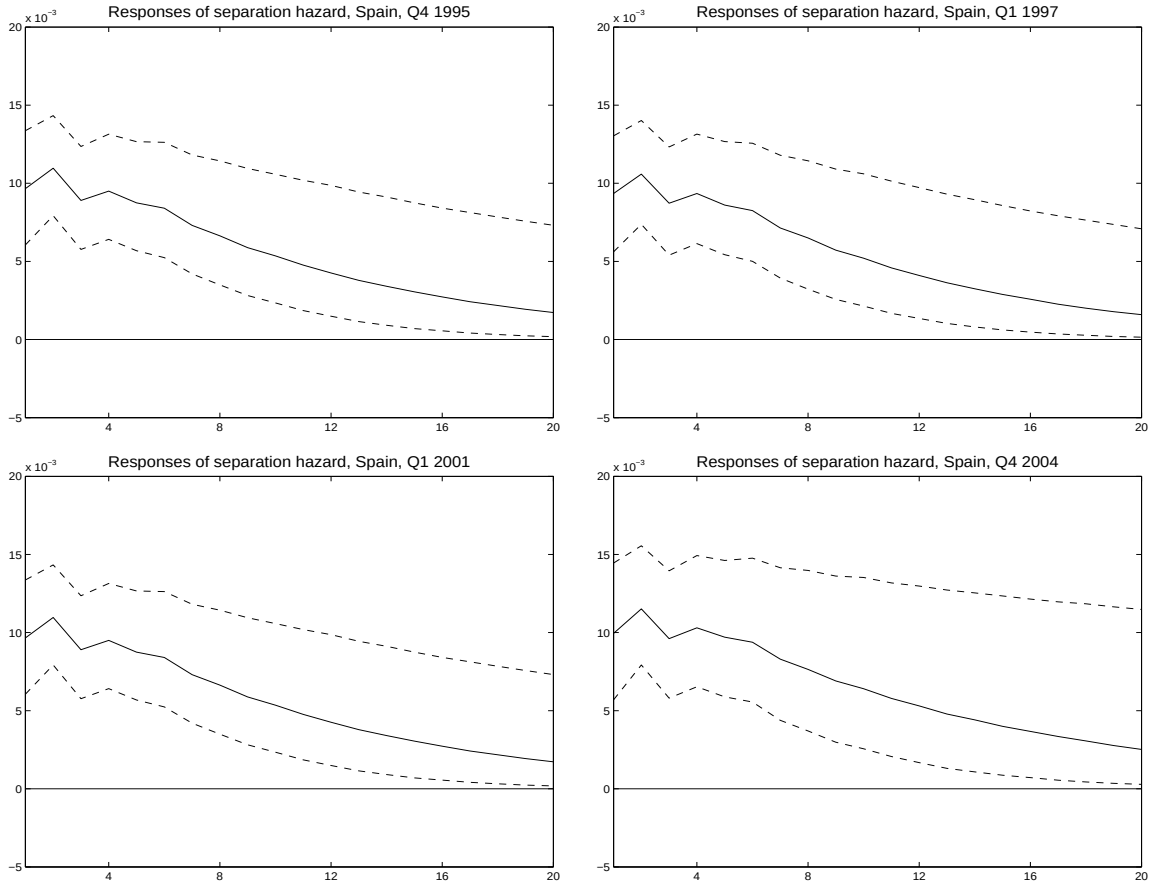


Figure C. 25. Impulse responses of separation hazards -*Homo TVP-VAR*, Spain

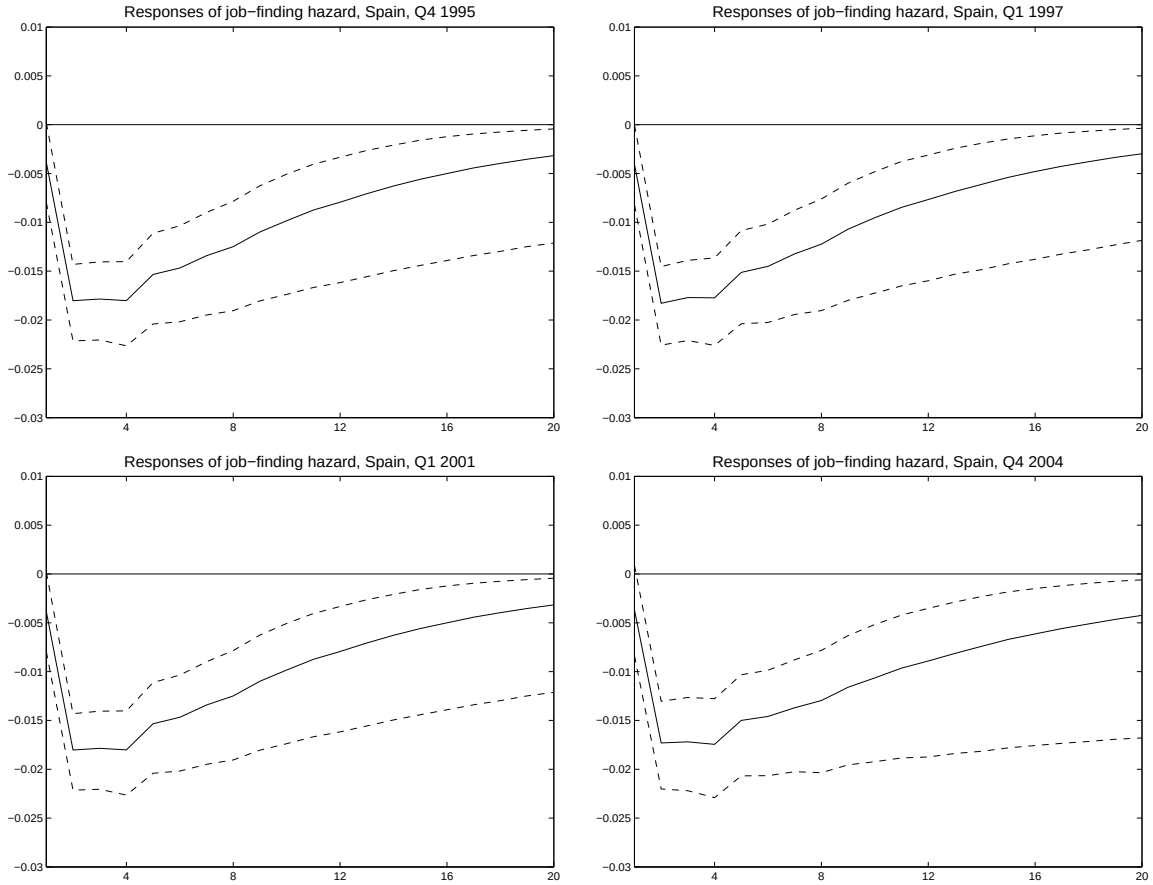


Figure C. 26. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

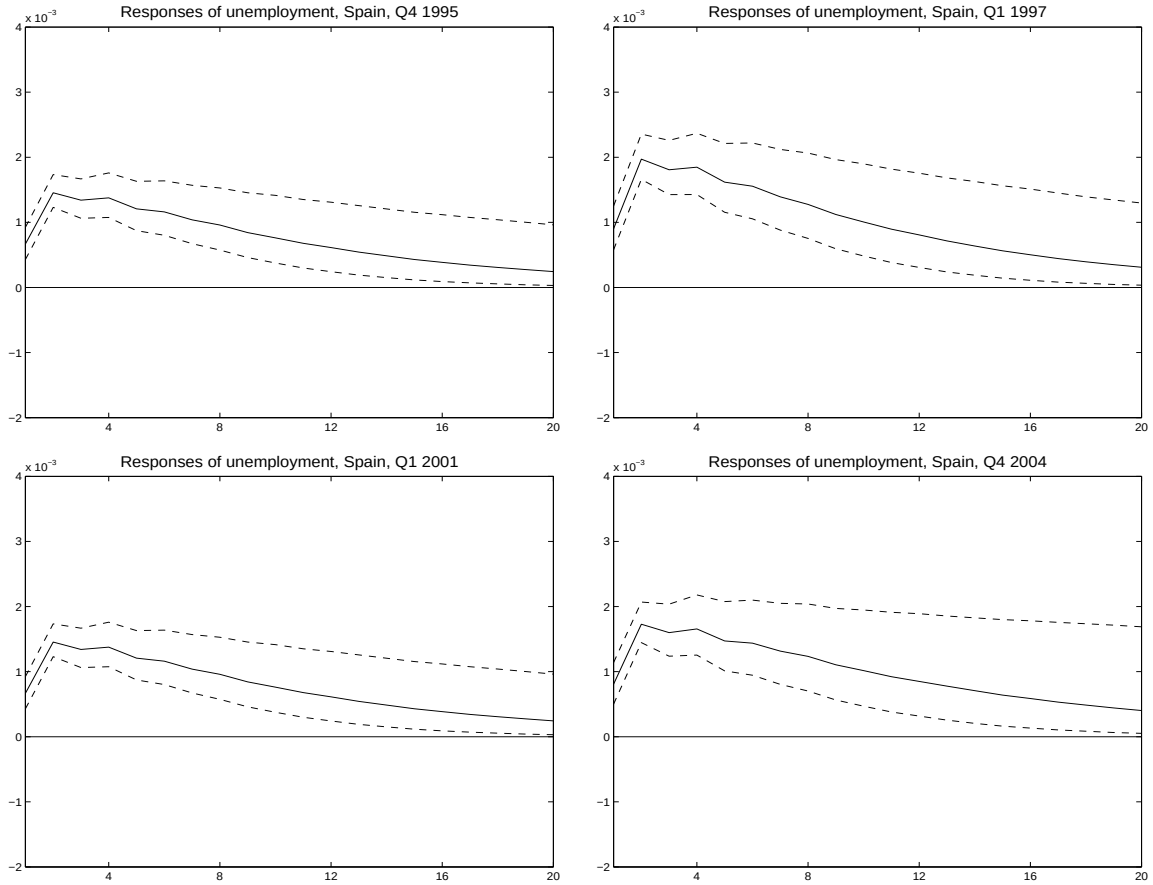


Figure C. 27. Impulse responses of unemployment rates -*Homo TVP-VAR*, Spain

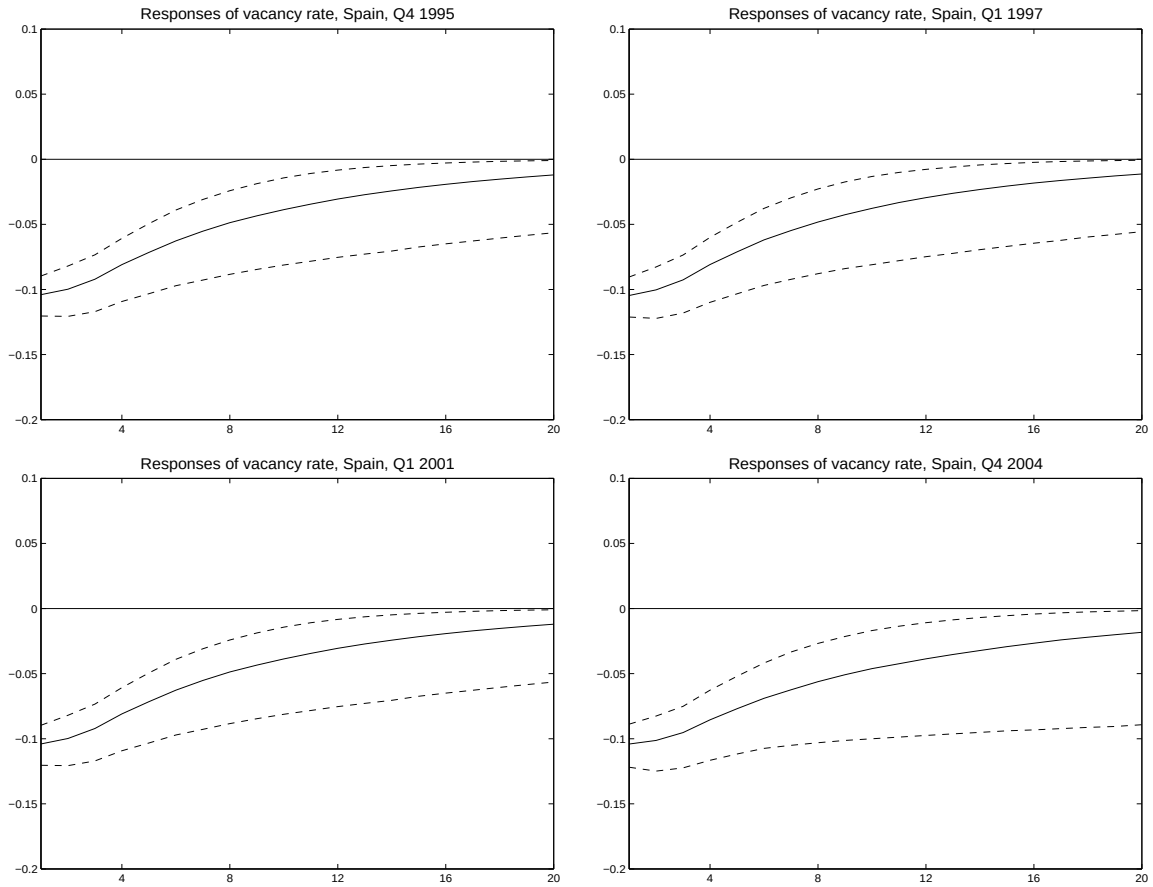


Figure C. 28. Impulse responses of vacancies -*Homo TVP-VAR*, Spain

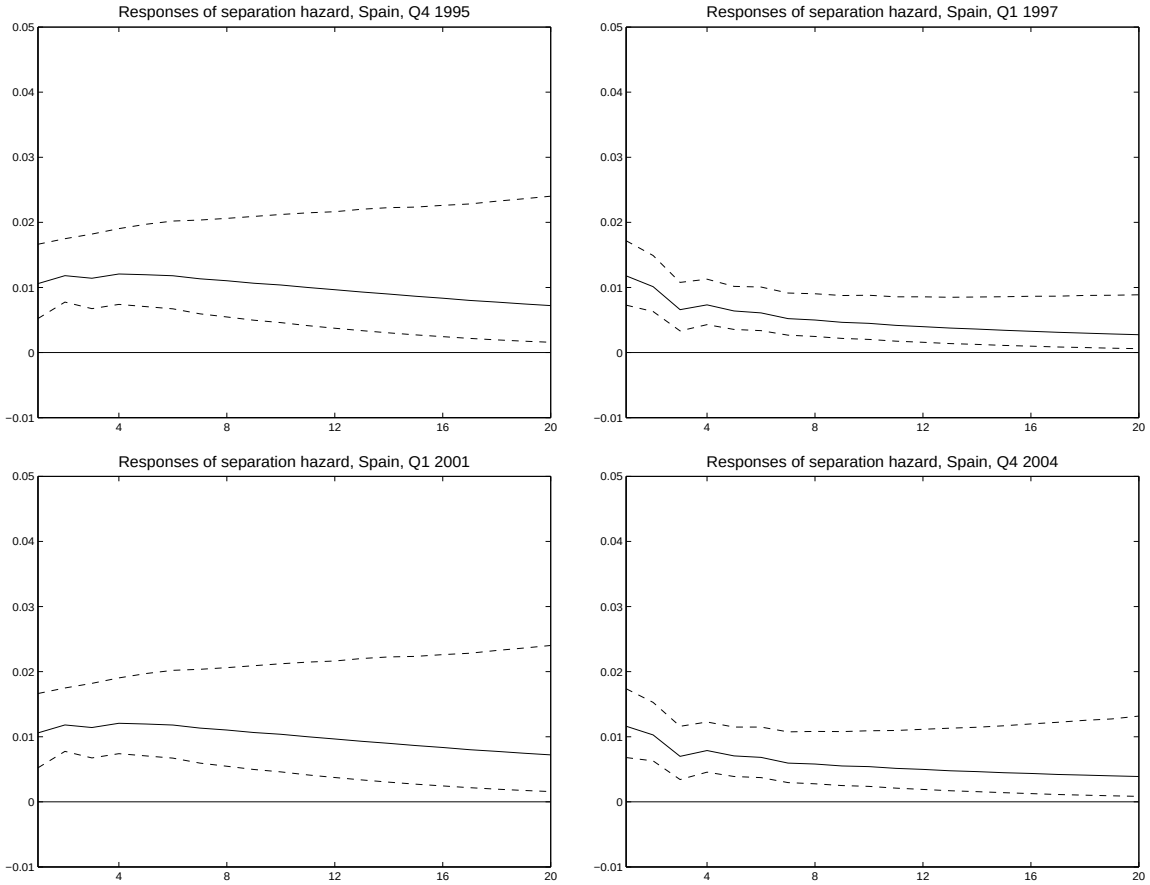


Figure C. 29. Impulse responses of separation hazards -*Hete TVP-VAR*, Spain

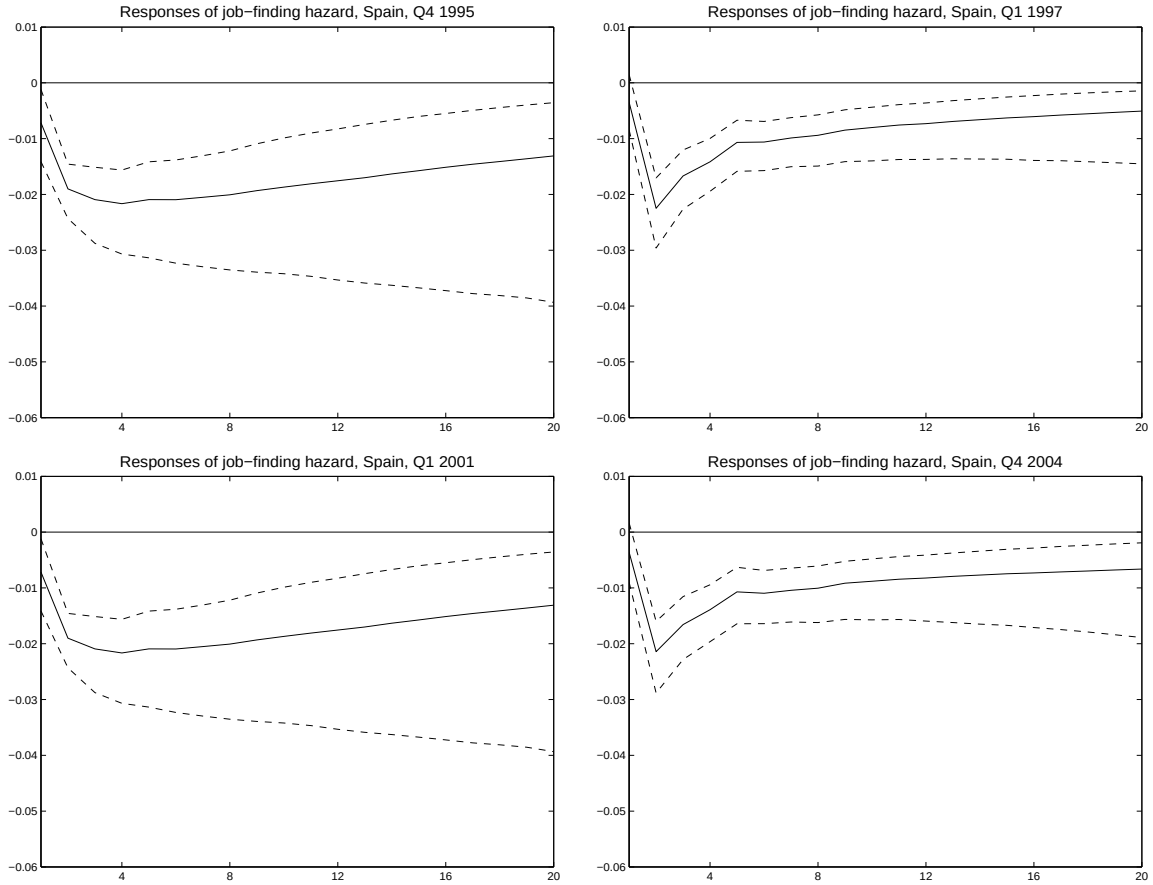


Figure C. 30. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

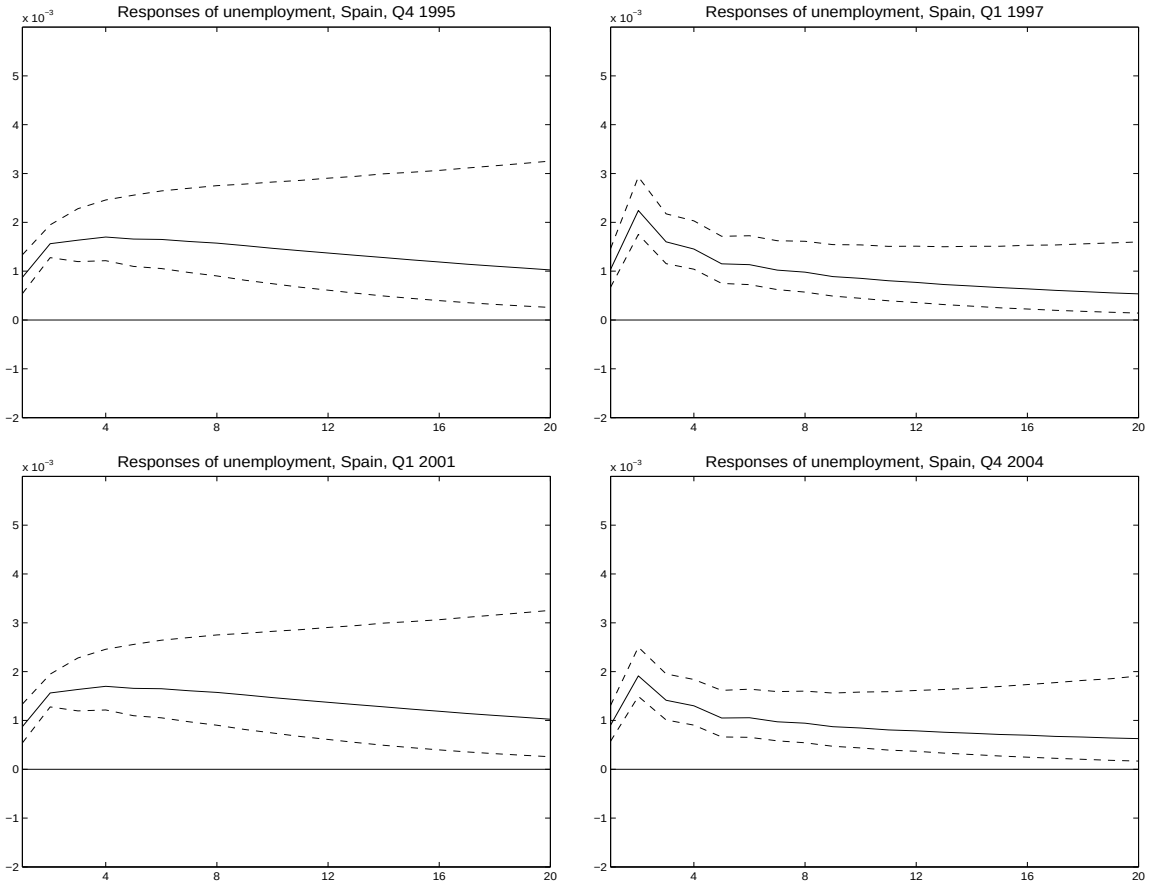


Figure C. 31. Impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

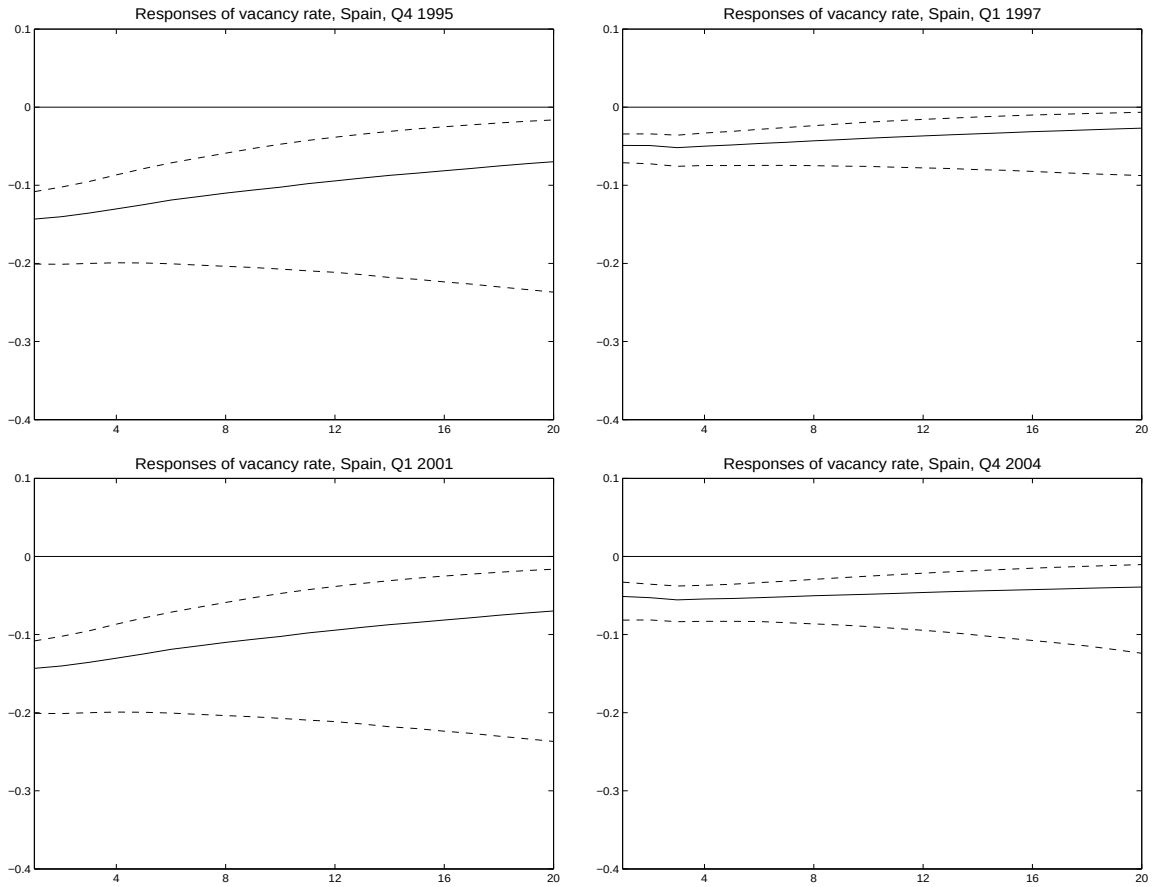


Figure C. 32. Impulse responses of vacancies -*Hete TVP-VAR*, Spain

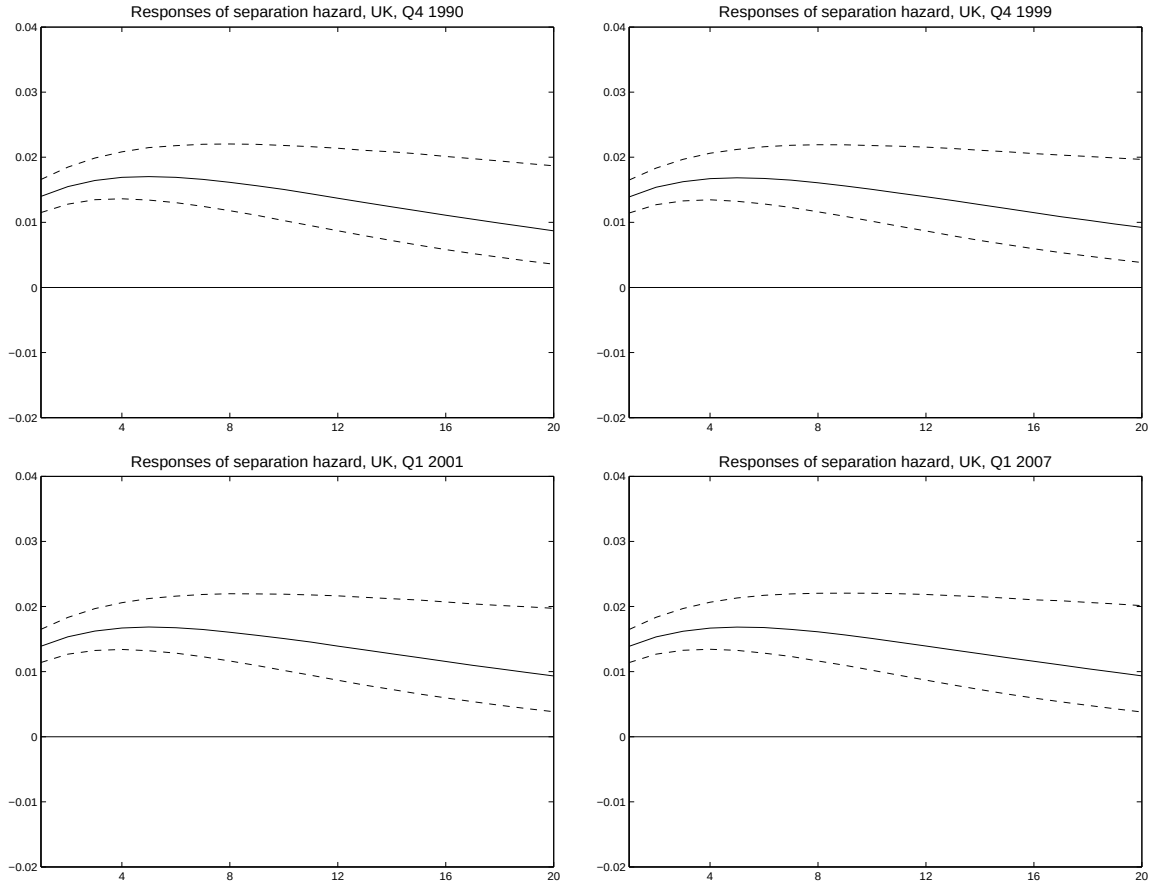


Figure C. 33. Impulse responses of separation hazards -*Homo TVP-VAR*, UK

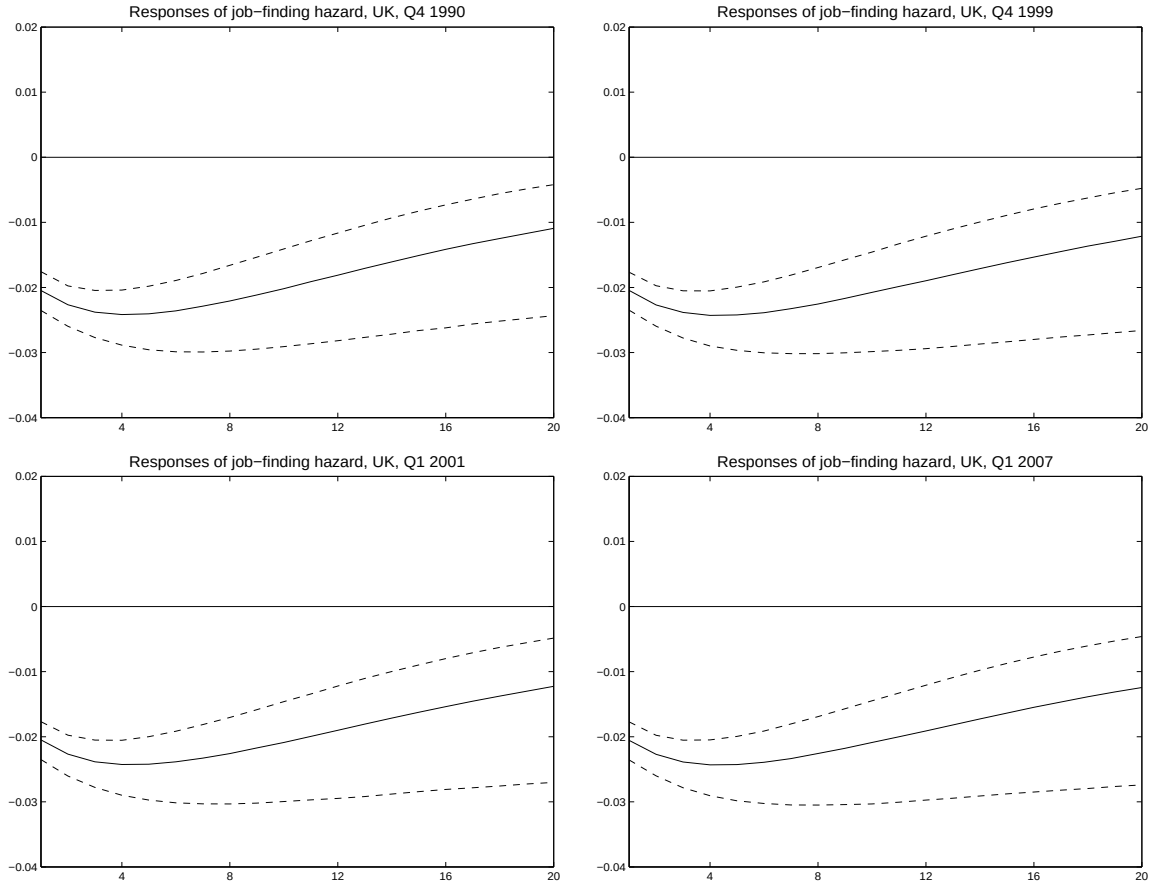


Figure C. 34. Impulse responses of job-finding hazards -*Homo TVP-VAR*, UK

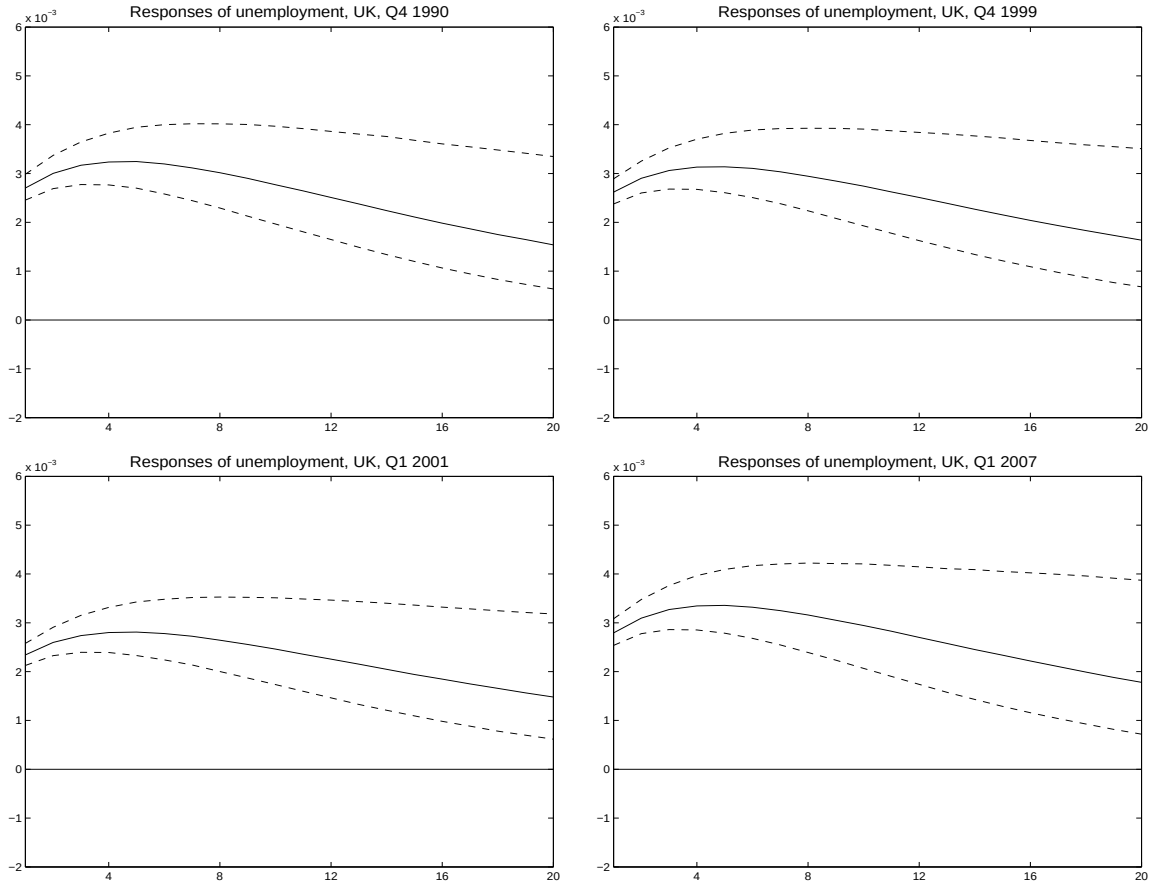


Figure C. 35. Impulse responses of unemployment rates -*Homo TVP-VAR*, UK

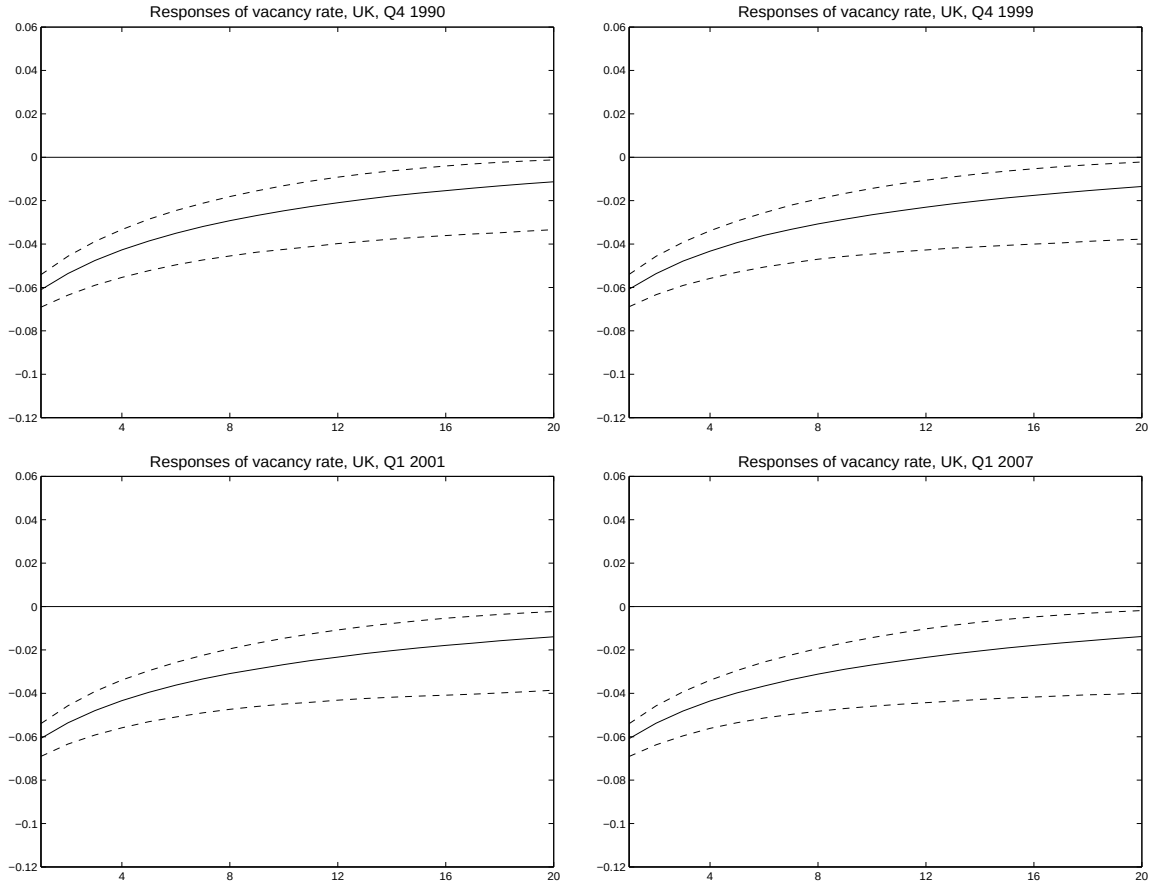


Figure C. 36. Impulse responses of vacancies -*Homo TVP-VAR*, UK

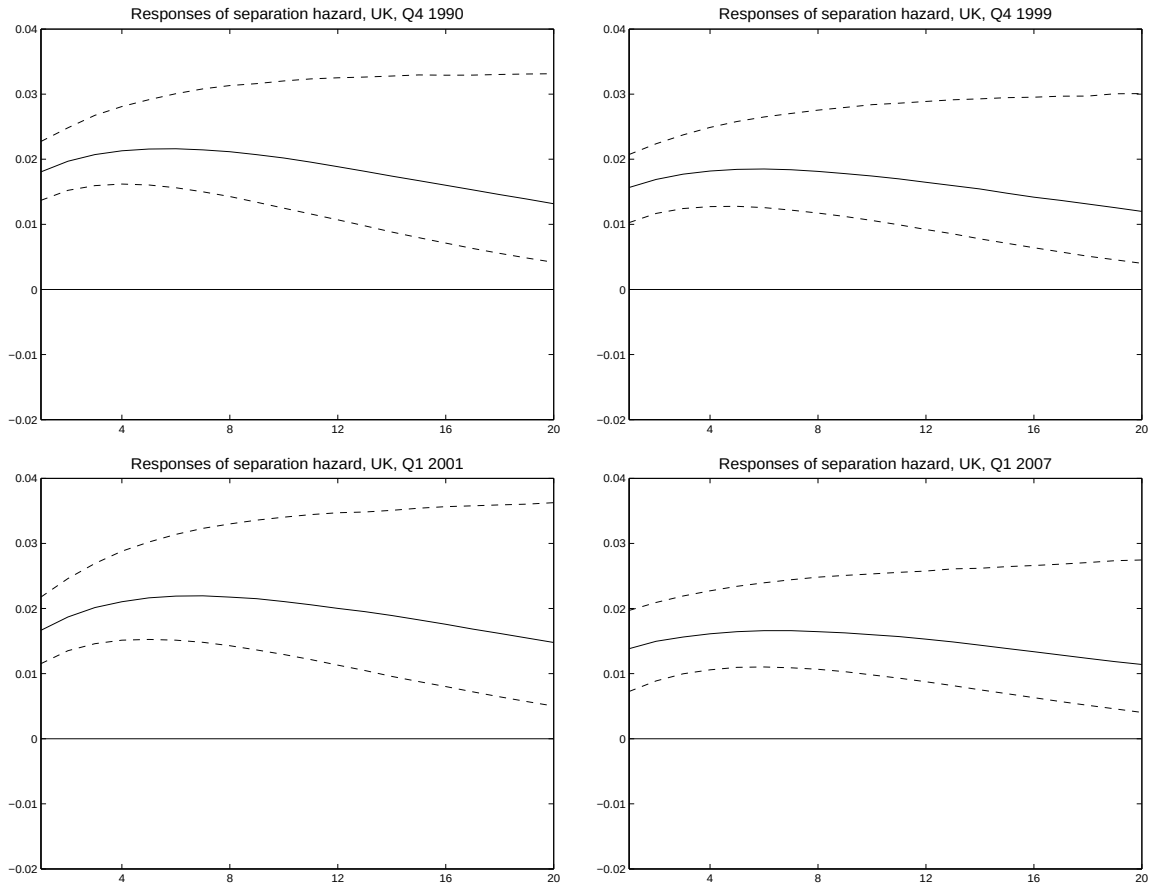


Figure C. 37. Impulse responses of separation hazards -*Hete TVP-VAR*, UK

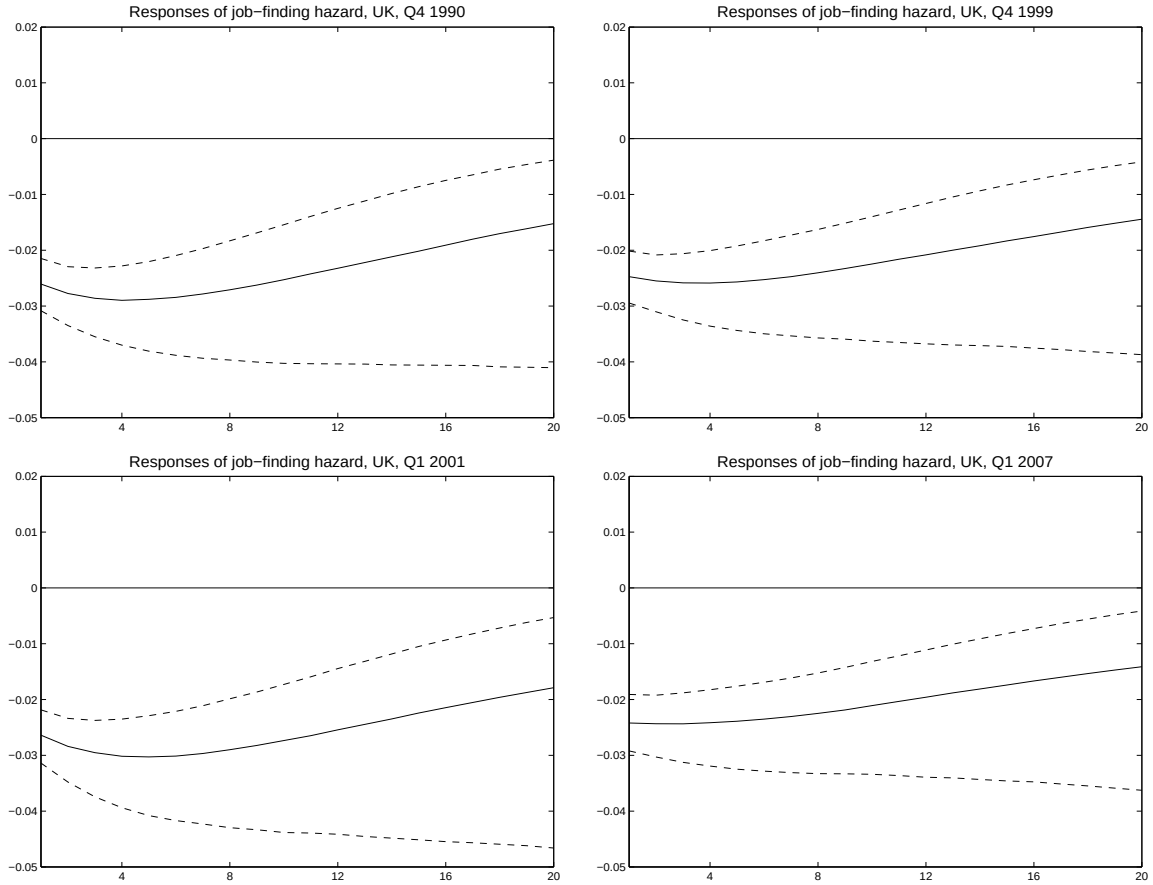


Figure C. 38. Impulse responses of job-finding hazards -*Hete TVP-VAR*, UK

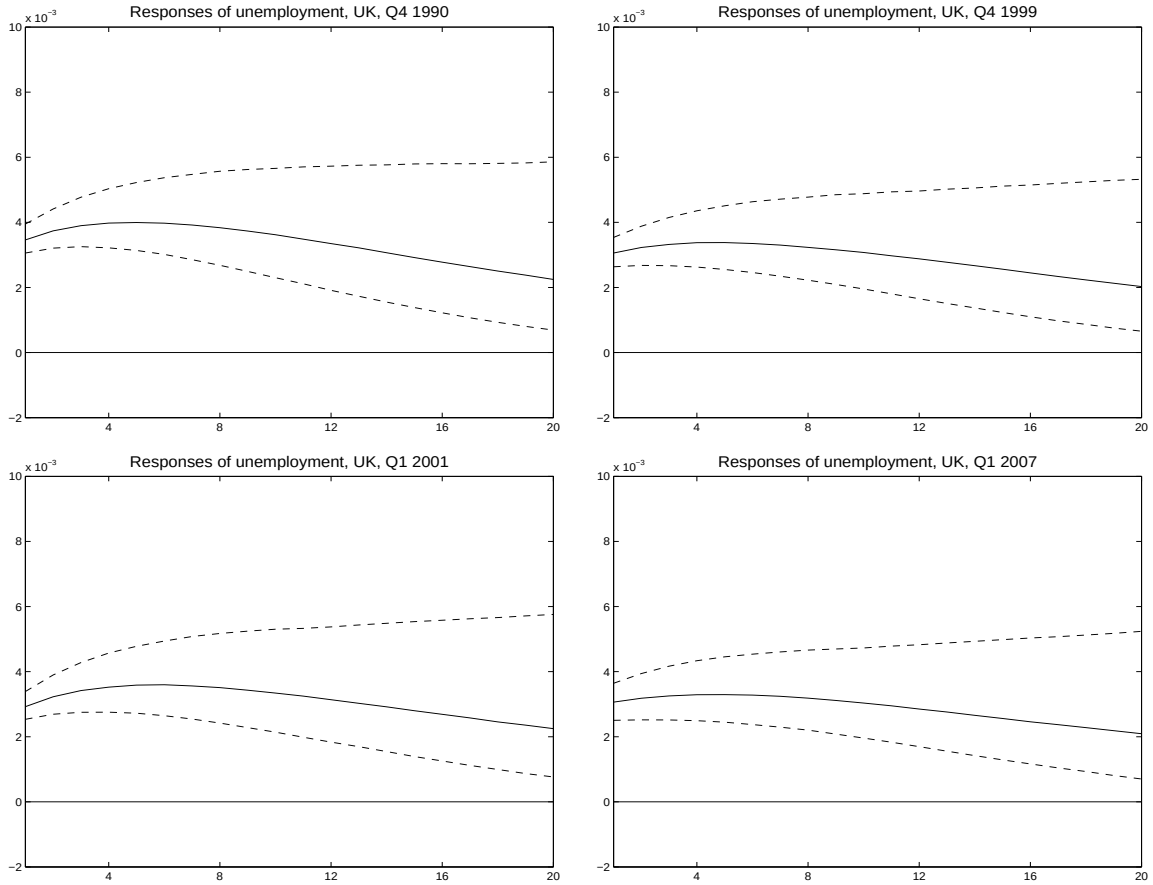


Figure C. 39. Impulse responses of unemployment rates -*Hete TVP-VAR*, UK

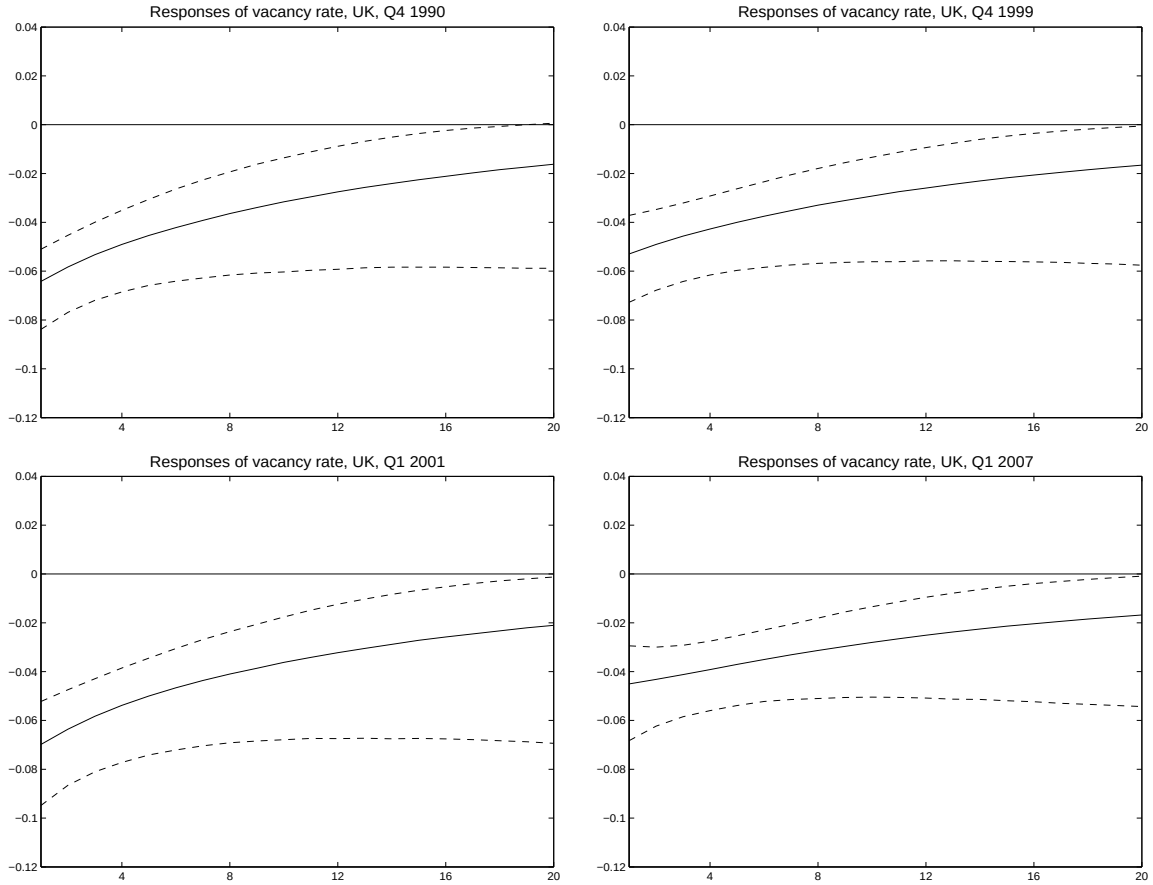


Figure C. 40. Impulse responses of vacancies -*Hete TVP-VAR*, UK

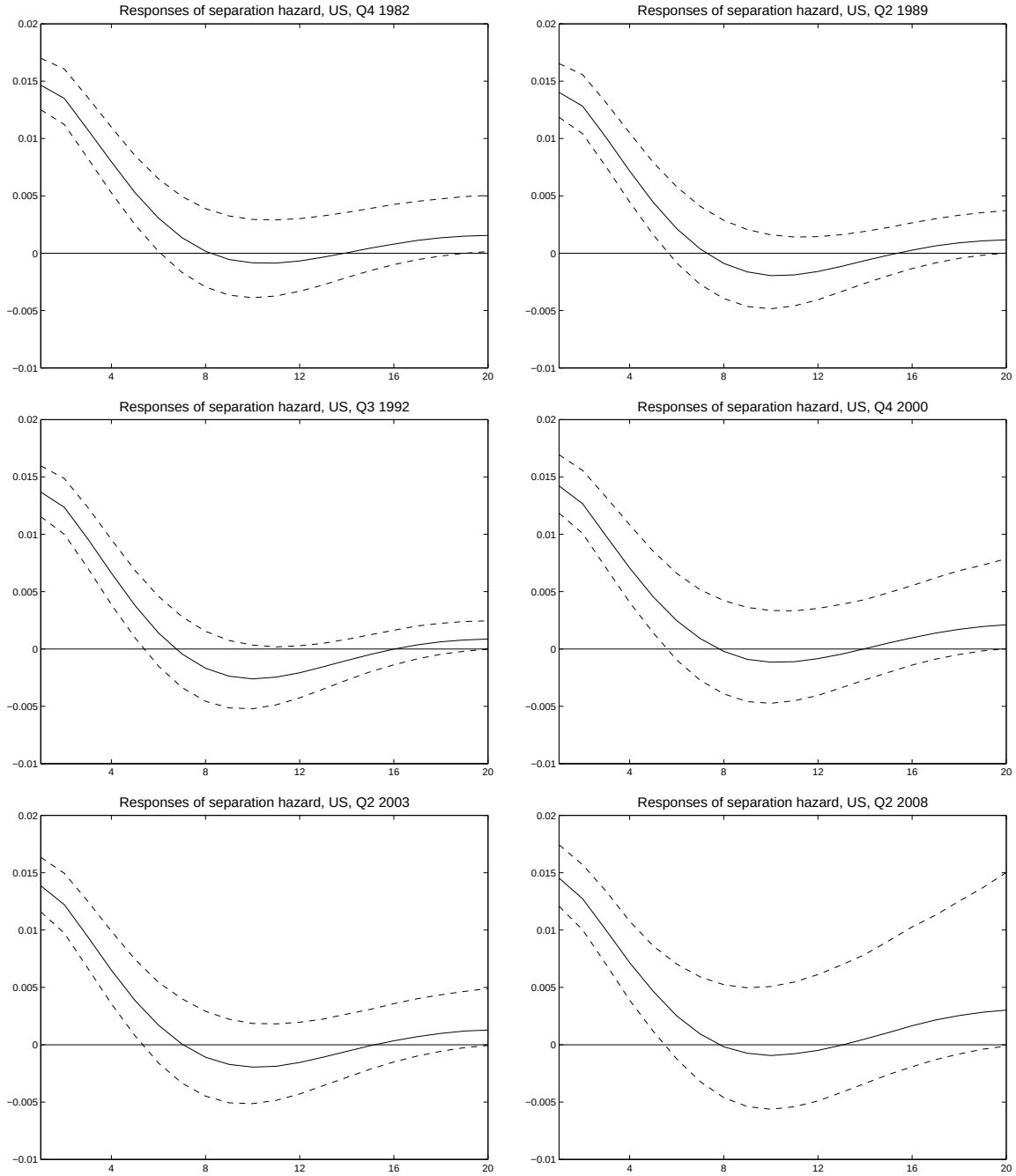


Figure D. 1. Impulse responses of separation hazards -*Homo TVP-VAR*, US

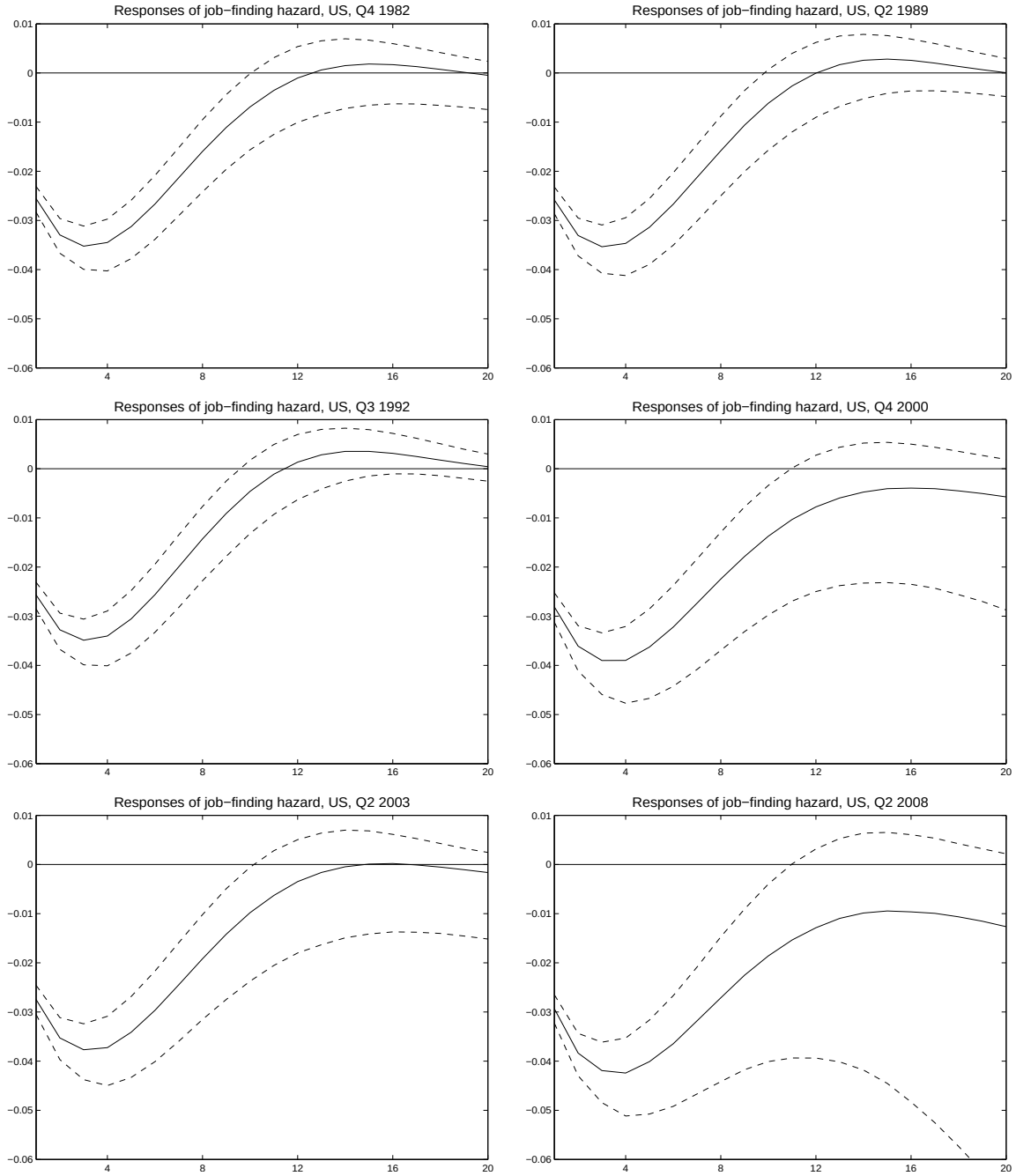


Figure D. 2. Impulse responses of job-finding hazards -*Homo TVP-VAR*, US

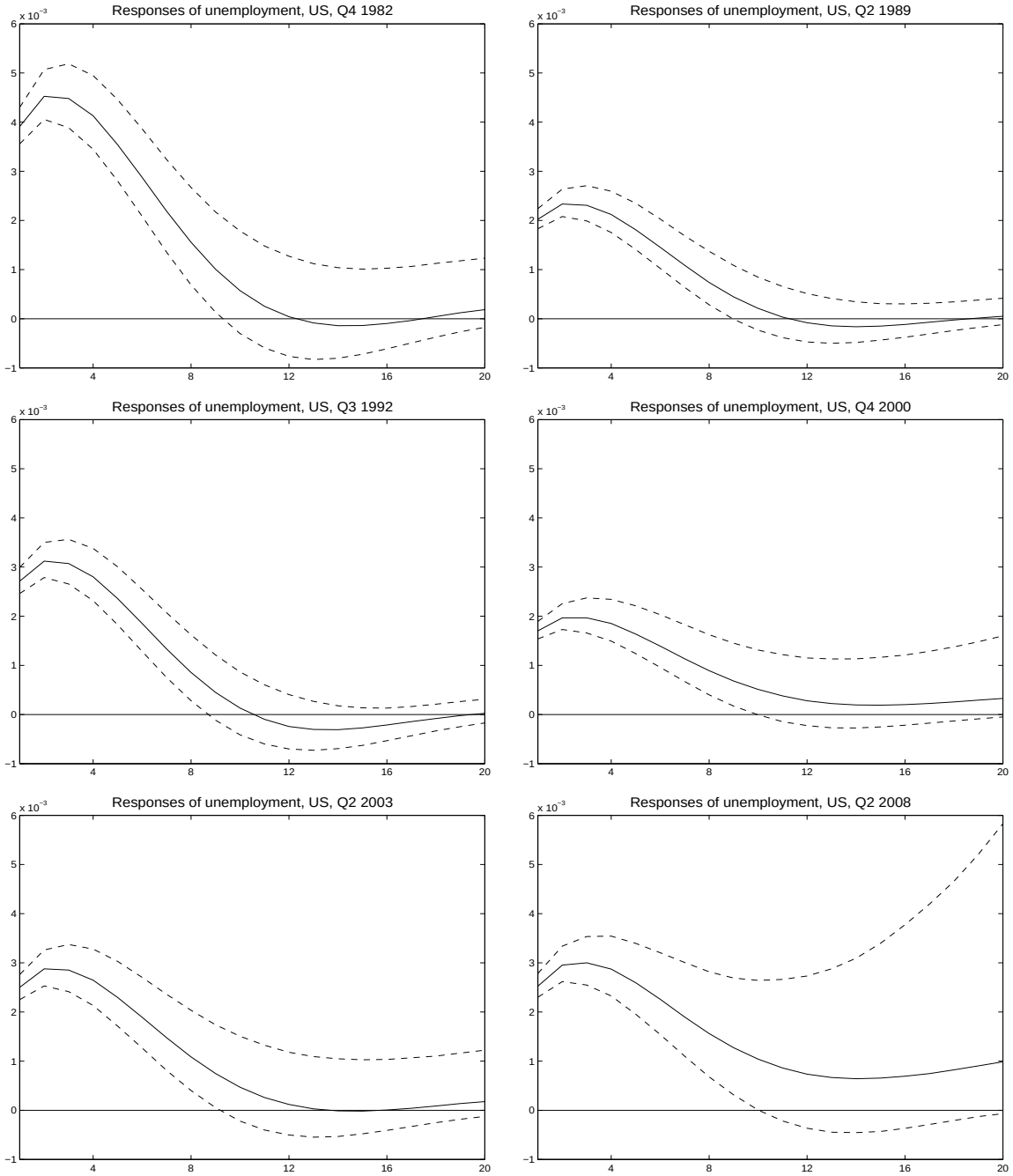


Figure D. 3. Impulse responses of unemployment rates -*Homo TVP-VAR*, US

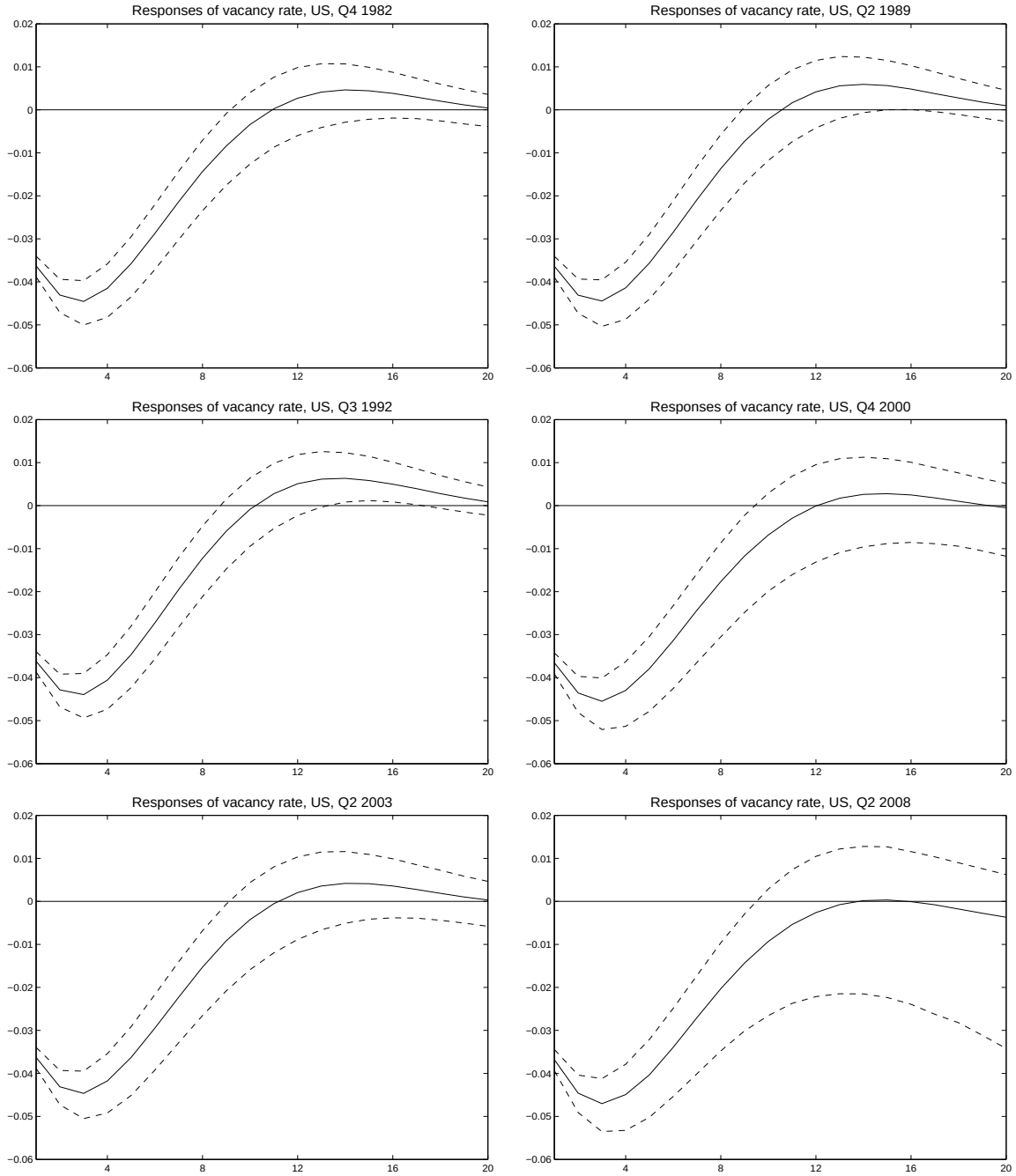


Figure D. 4. Impulse responses of vacancies -*Homo TVP-VAR*, US

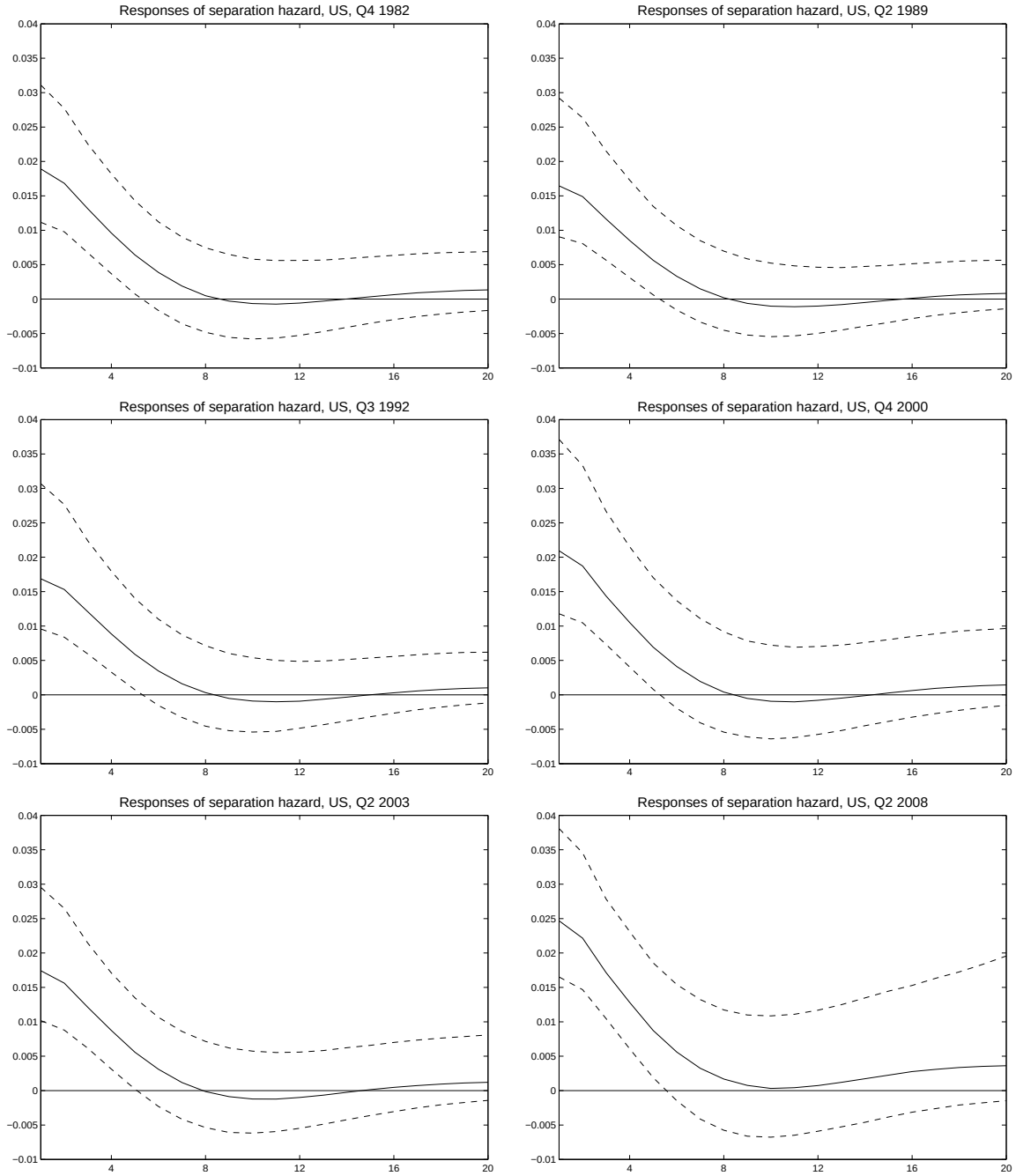


Figure D. 5. Impulse responses of separation hazards -*Hete TVP-VAR*, US

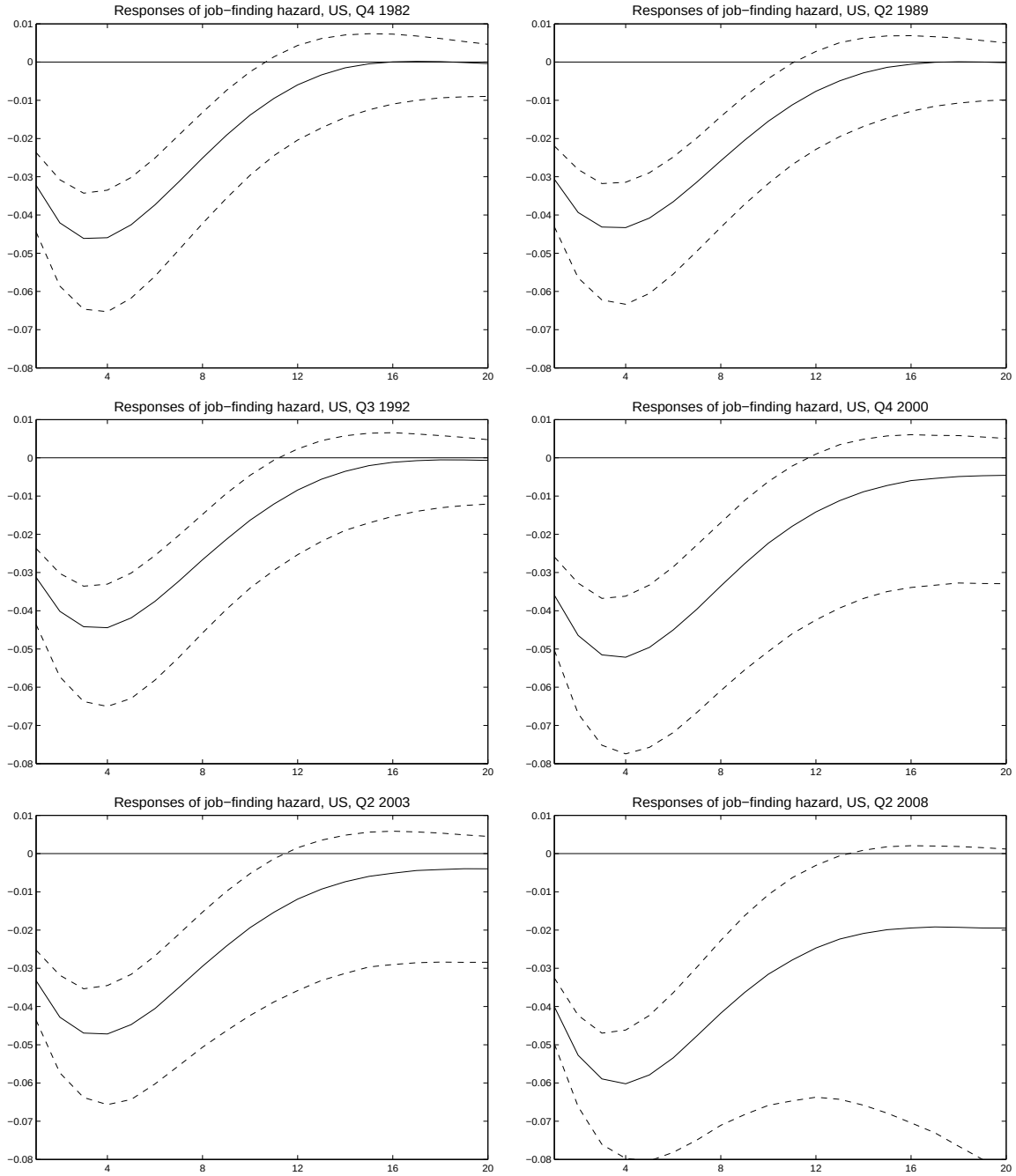


Figure D. 6. Impulse responses of job-finding hazards -*Hete TVP-VAR*, US

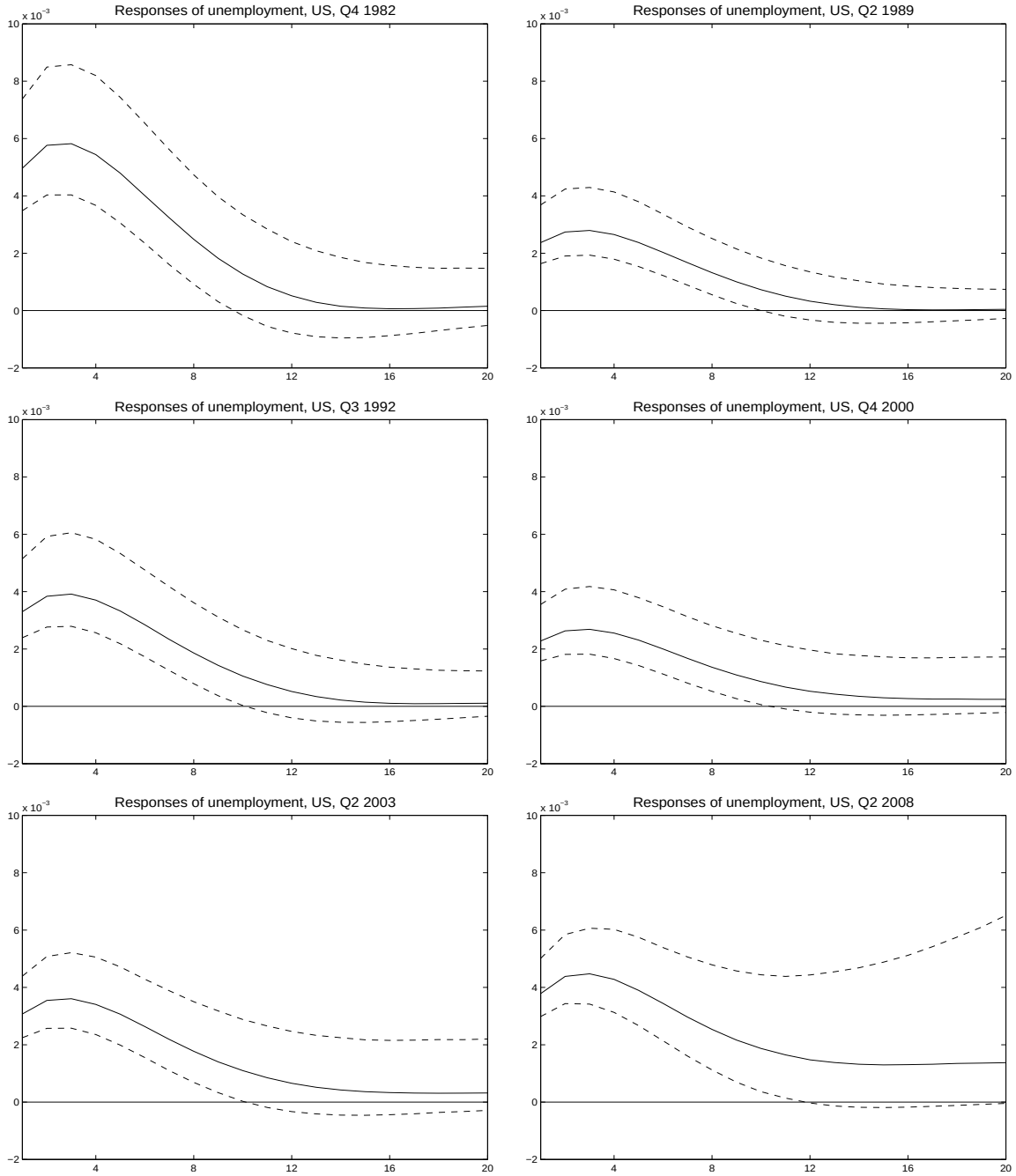


Figure D. 7. Impulse responses of unemployment rates -*Hete TVP-VAR*, US

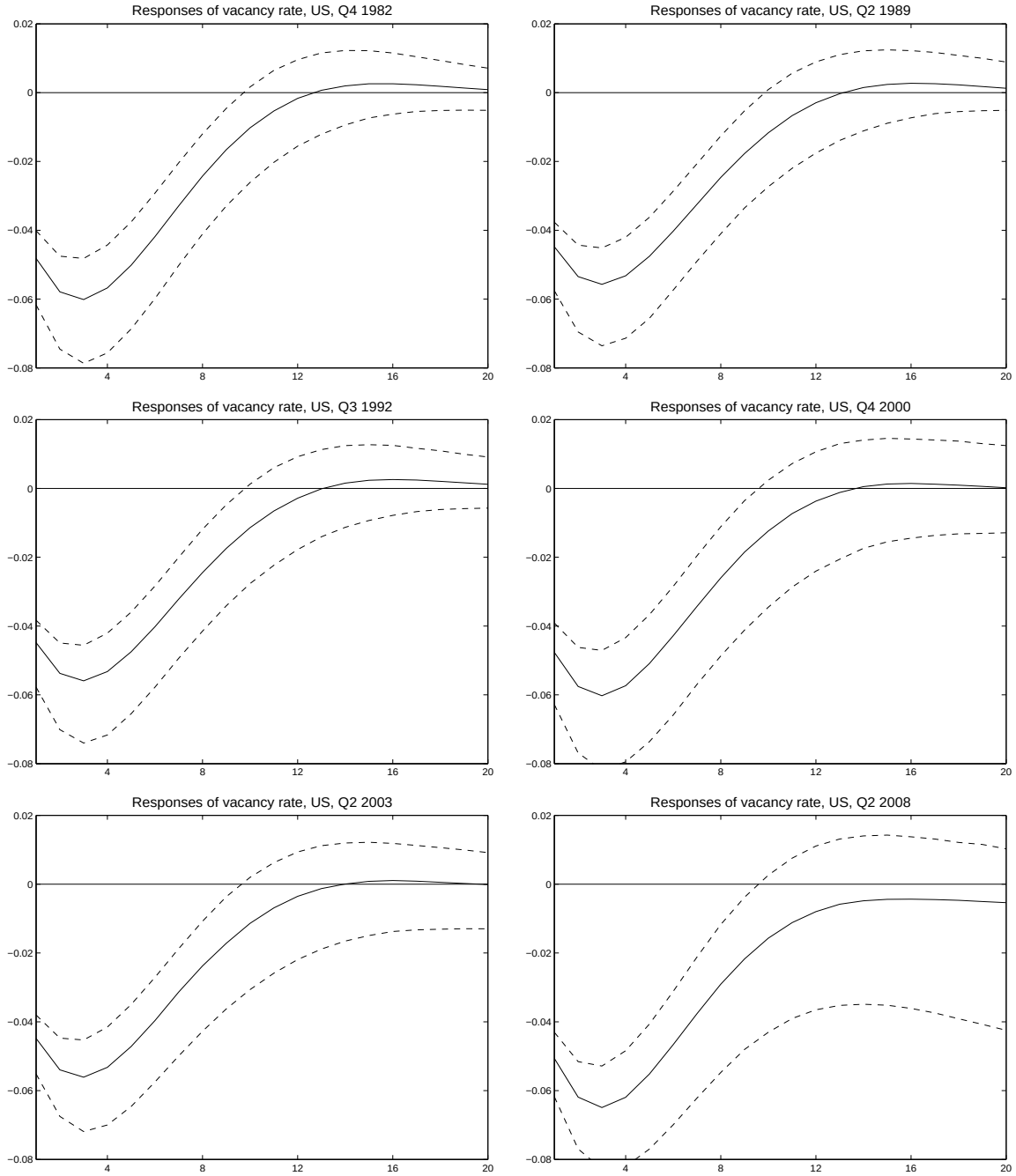


Figure D. 8. Impulse responses of vacancies -*Hete TVP-VAR*, US

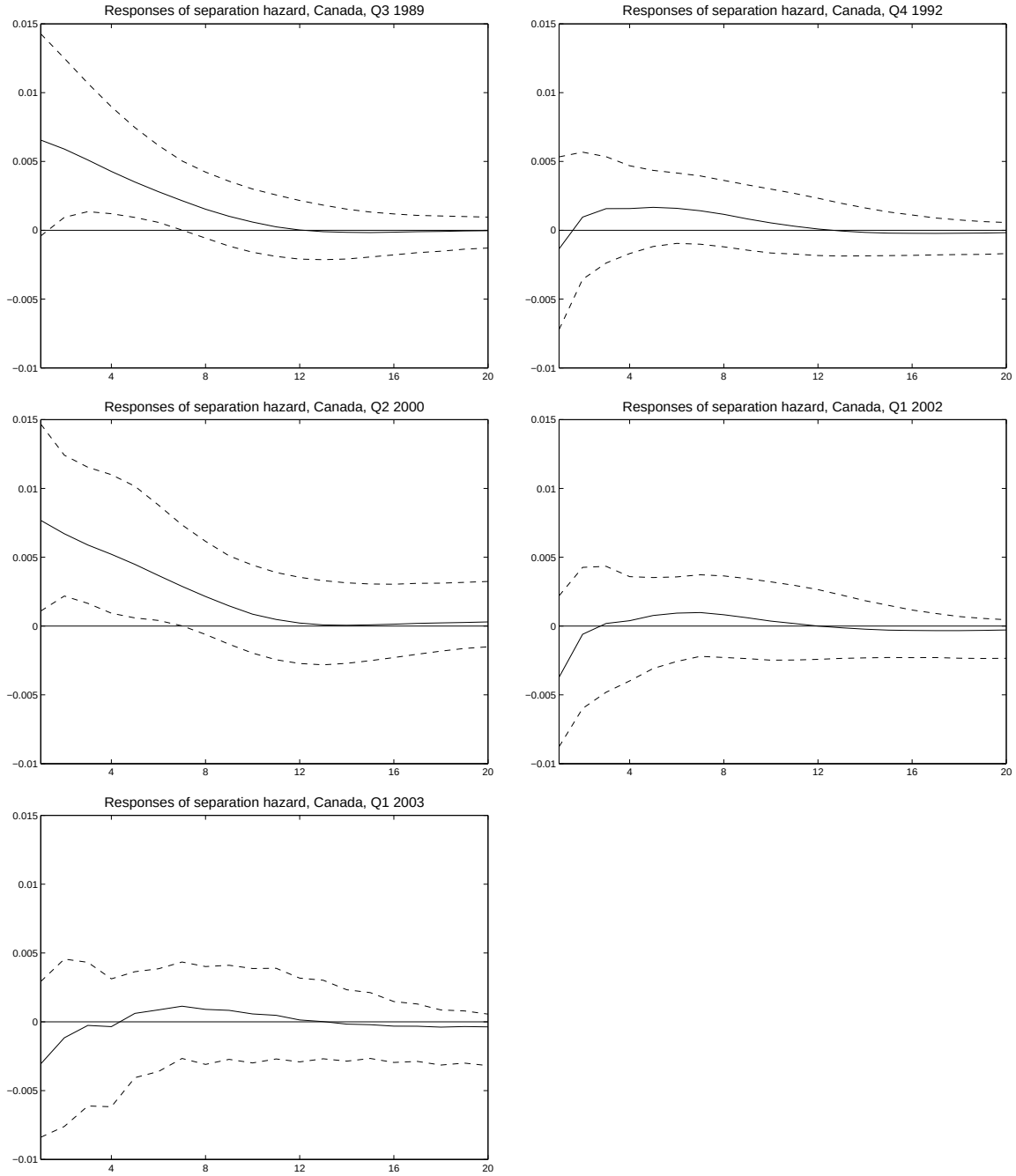


Figure D. 9. Impulse responses of separation hazards -*Homo TVP-VAR*, Canada

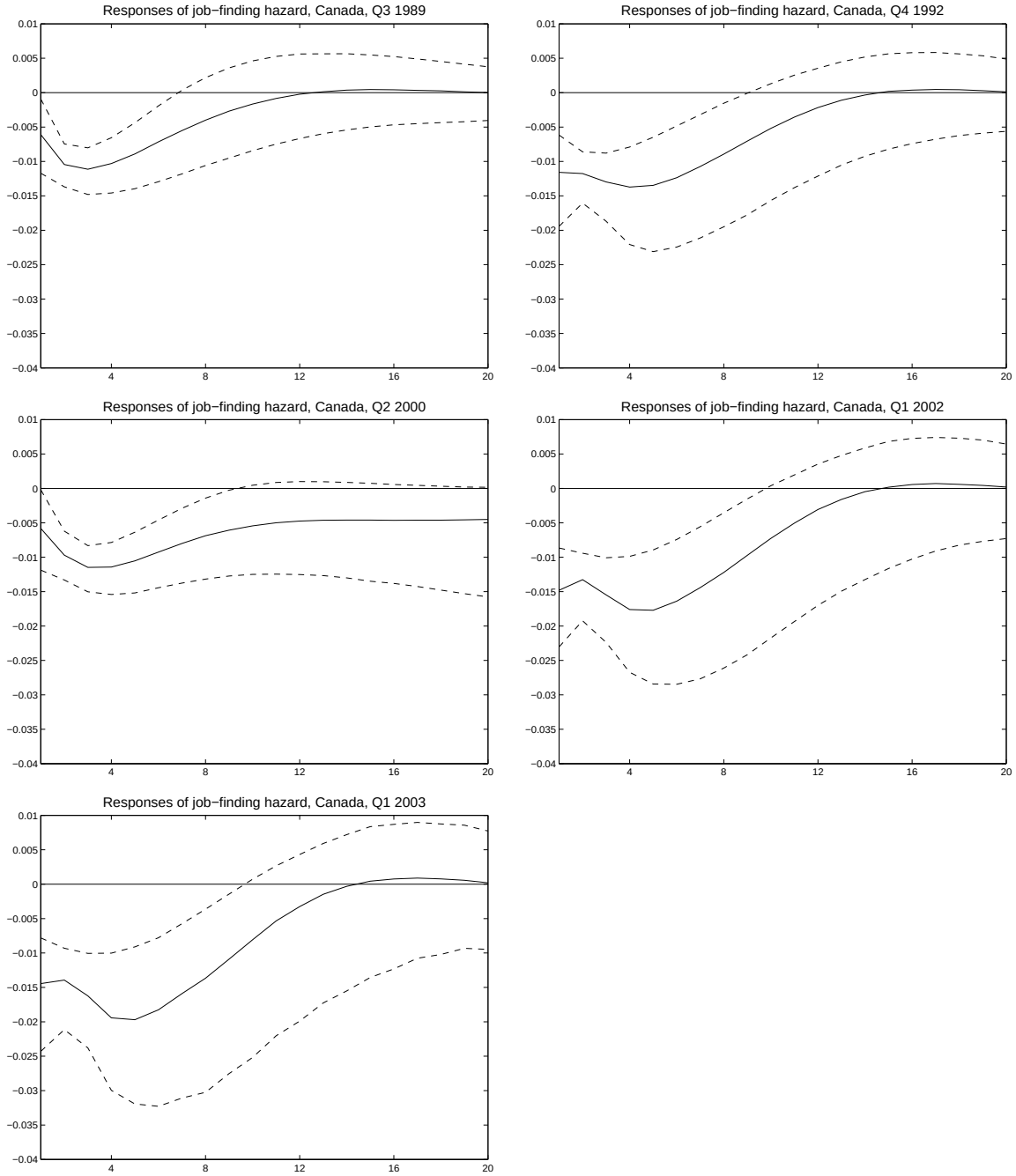
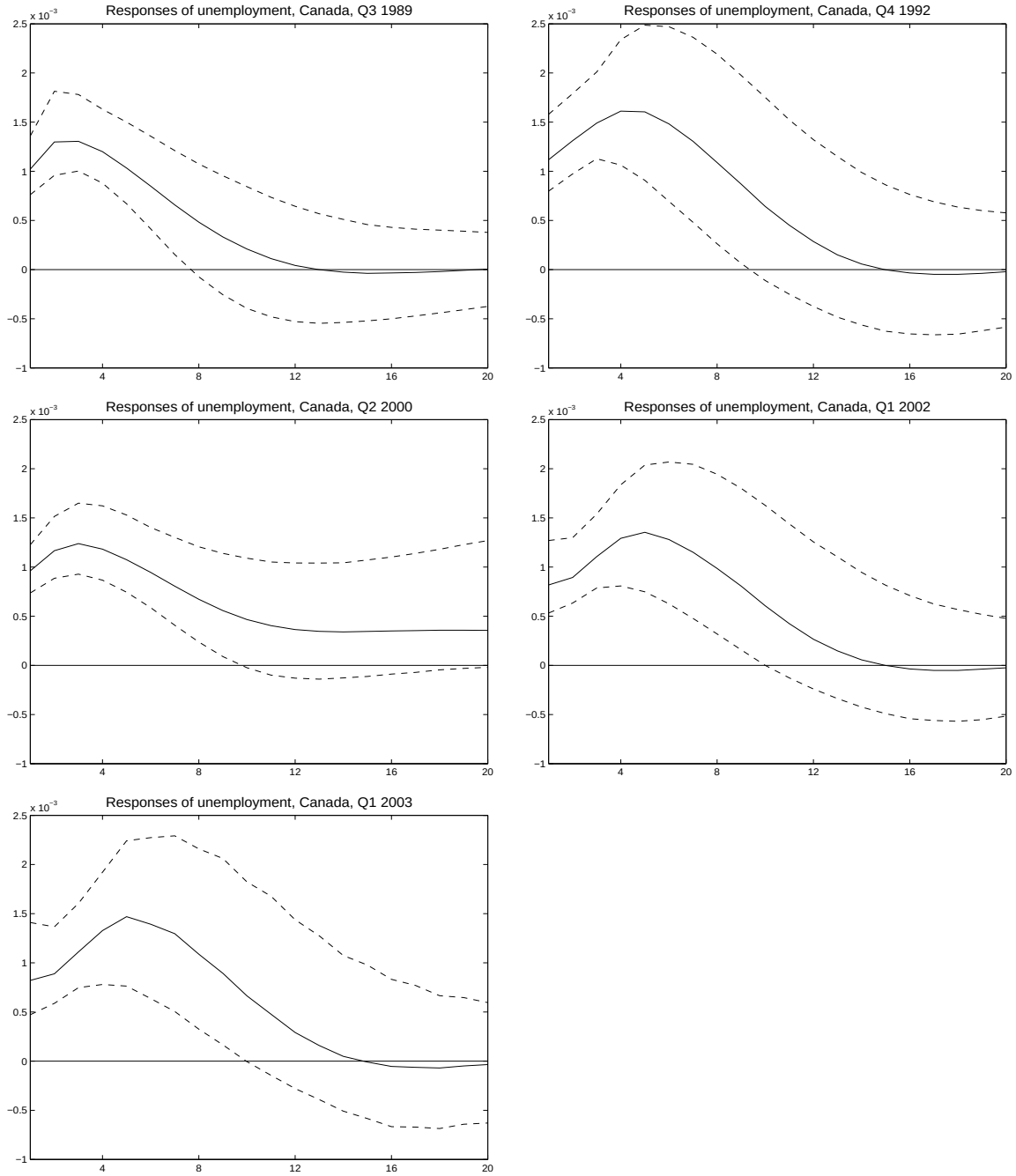


Figure D. 10. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada



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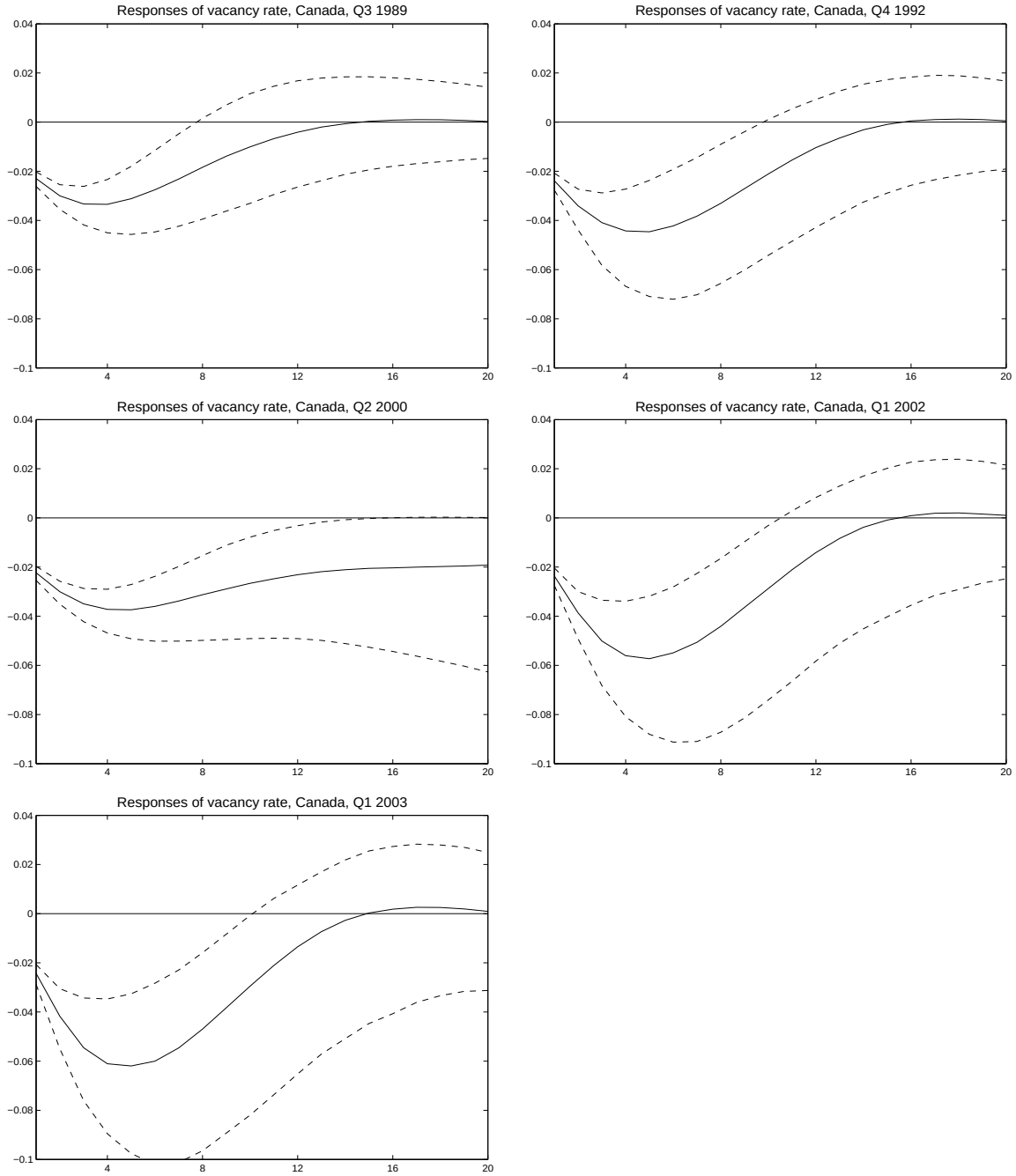
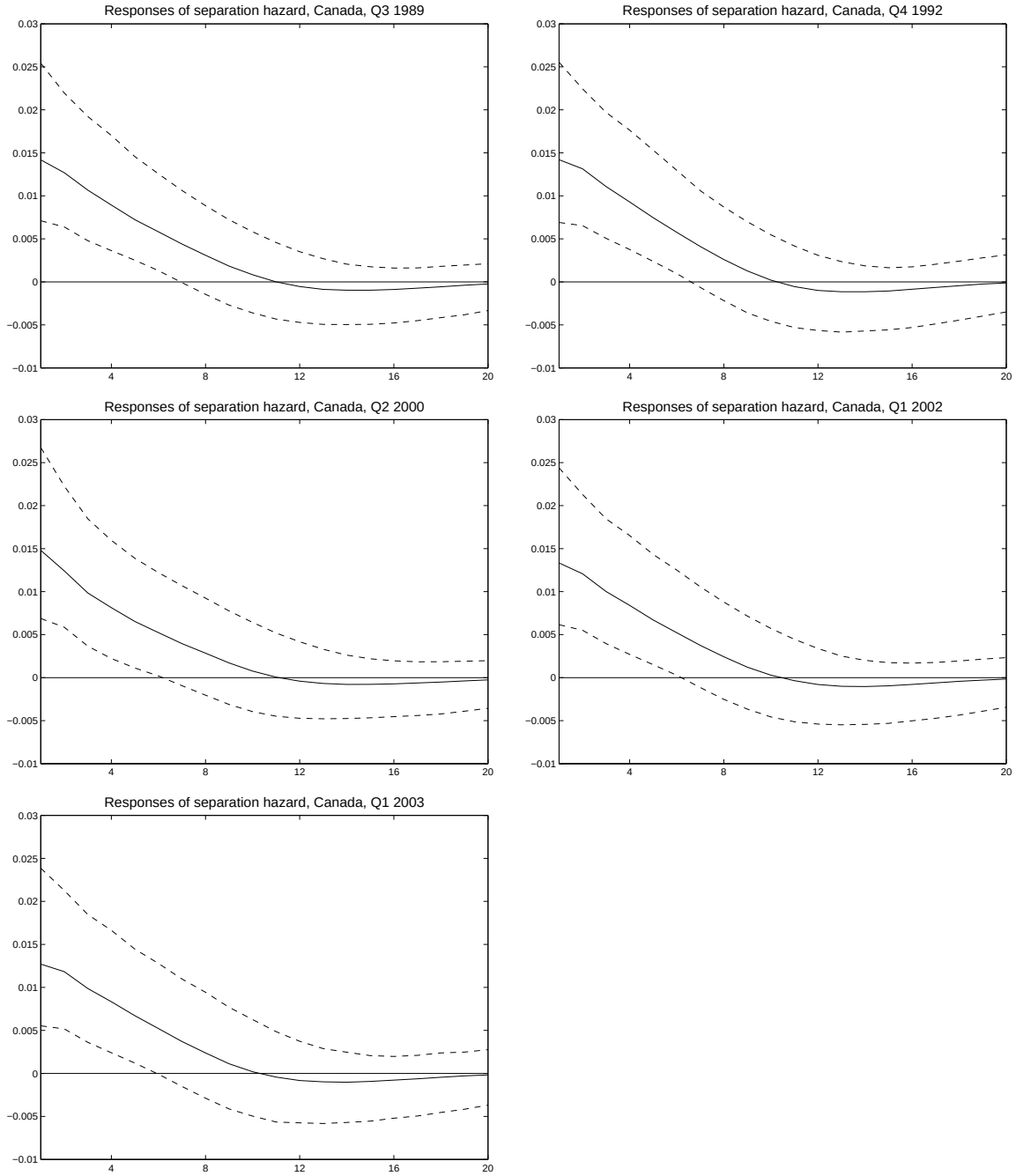


Figure D. 12. Impulse responses of vacancies -*Homo TVP-VAR*, Canada



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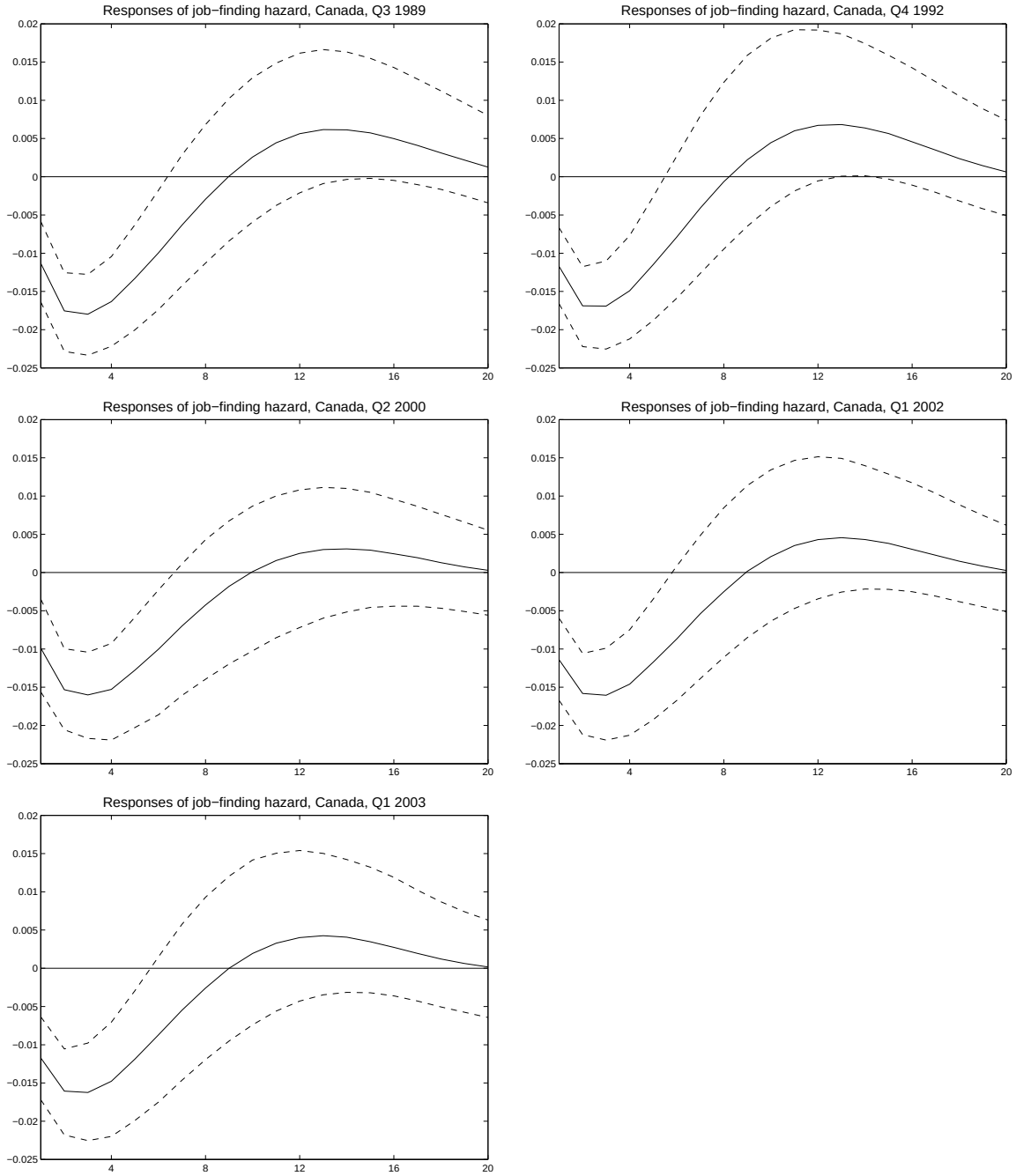
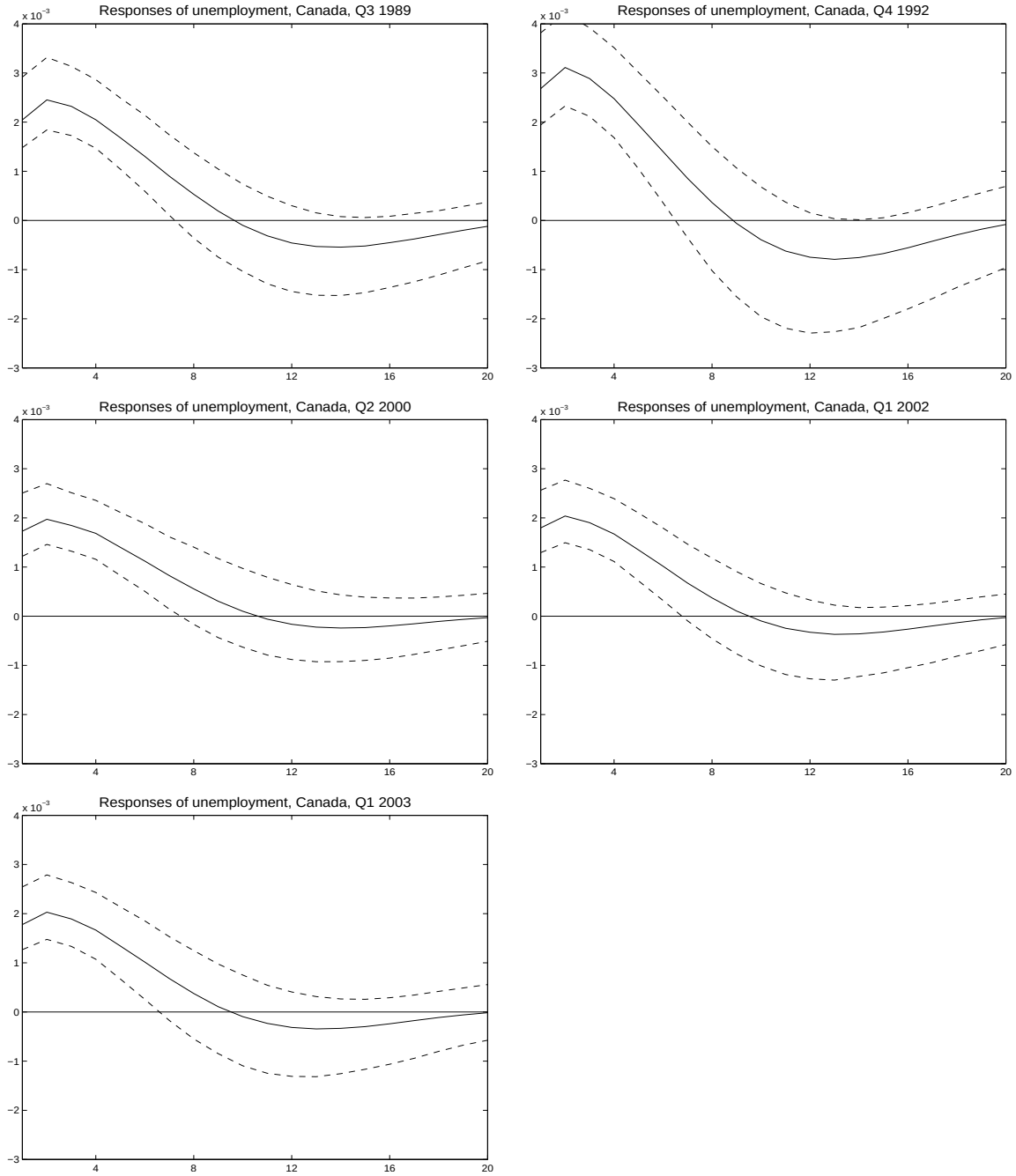


Figure D. 14. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Canada



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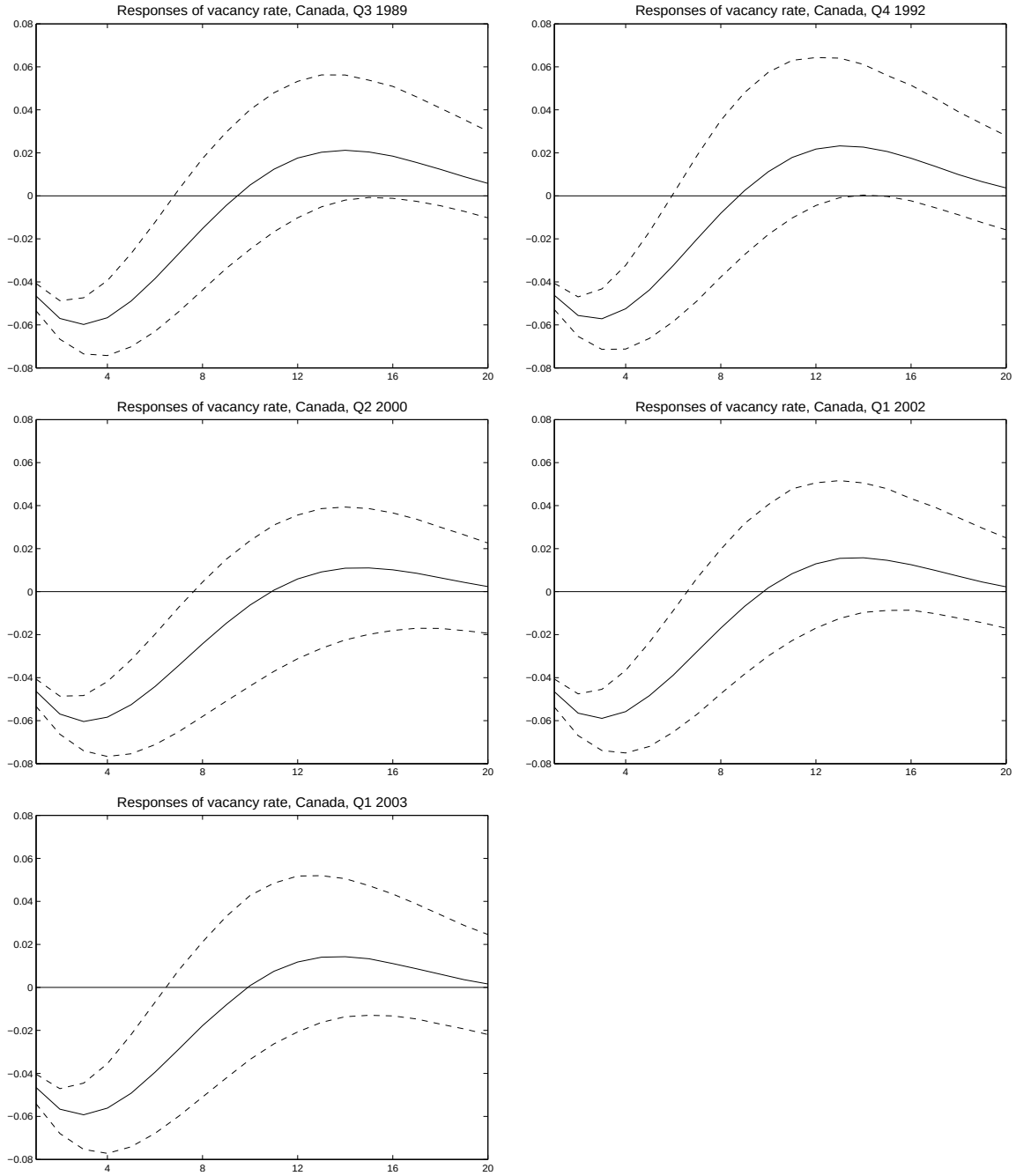


Figure D. 16. Impulse responses of vacancies -*Hete TVP-VAR*, Canada

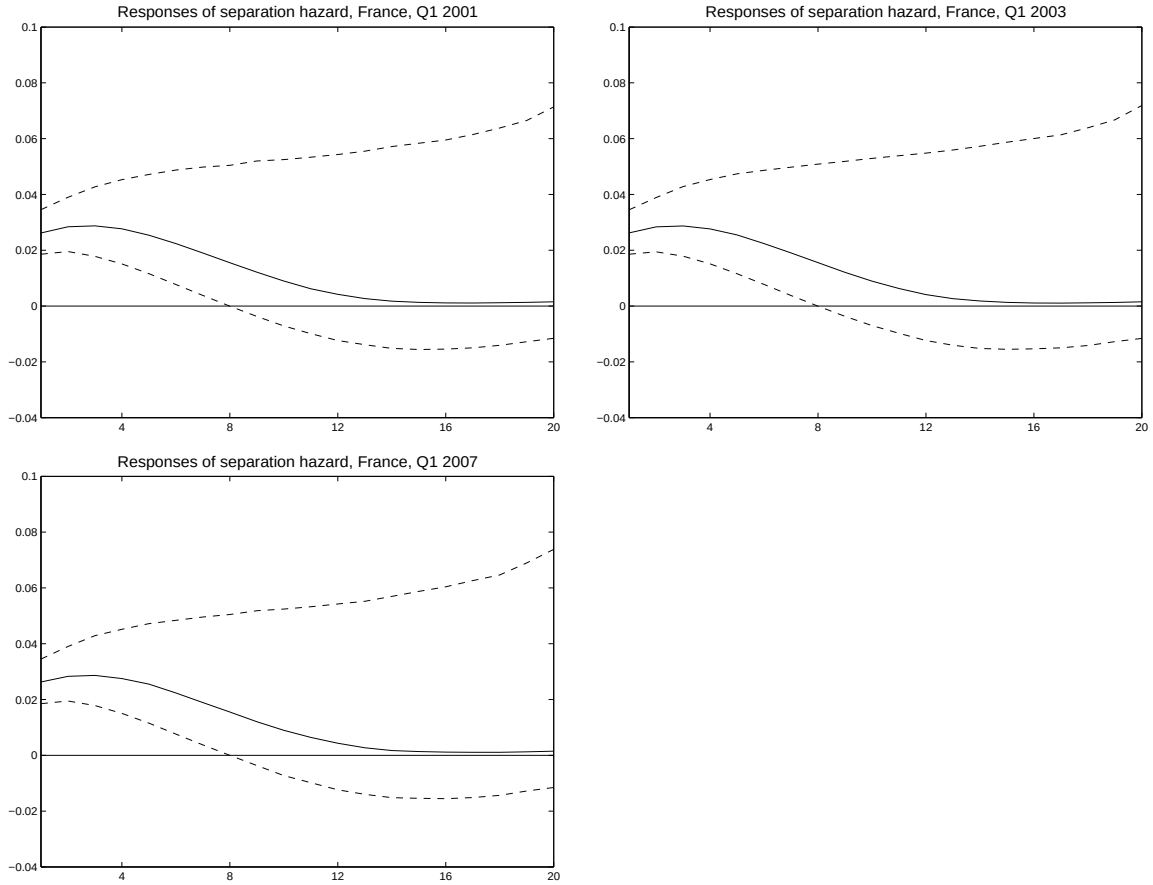
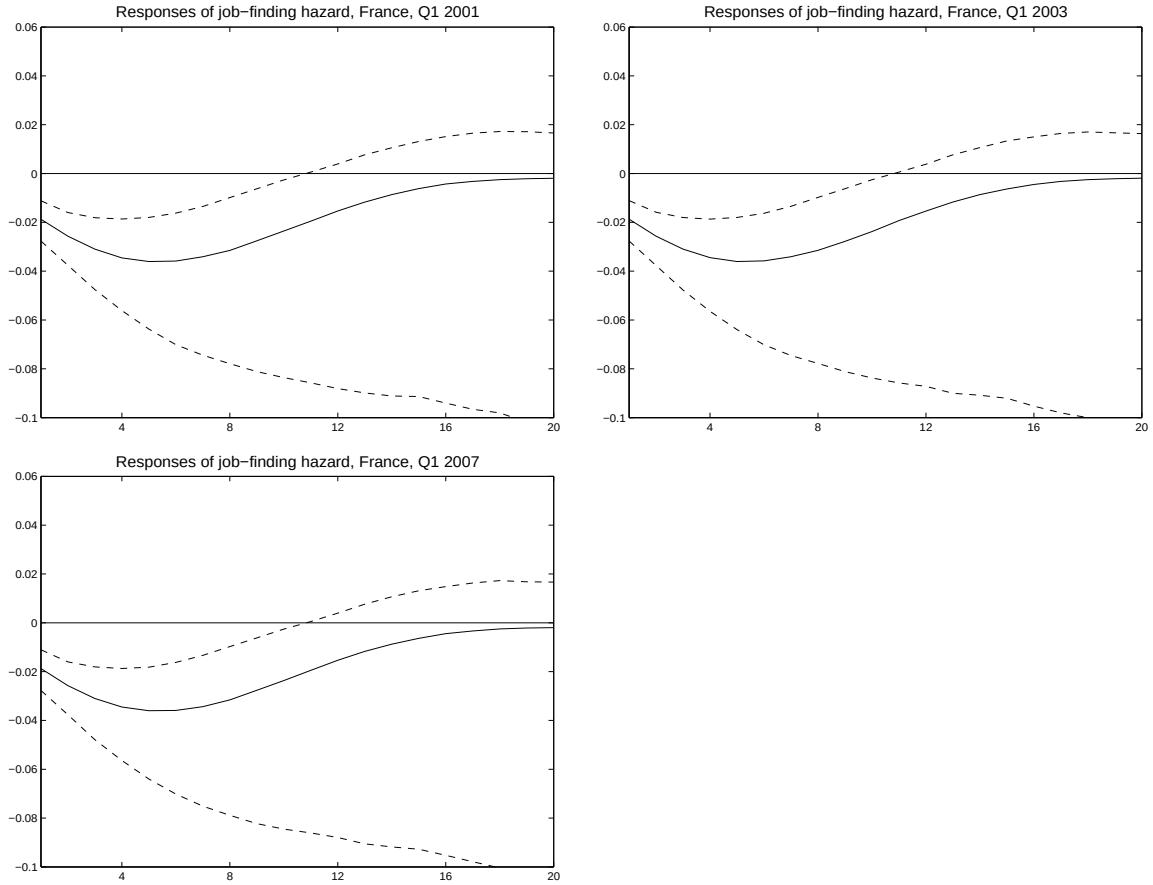


Figure D. 17. Impulse responses of separation hazards -*Homo TVP-VAR*, France



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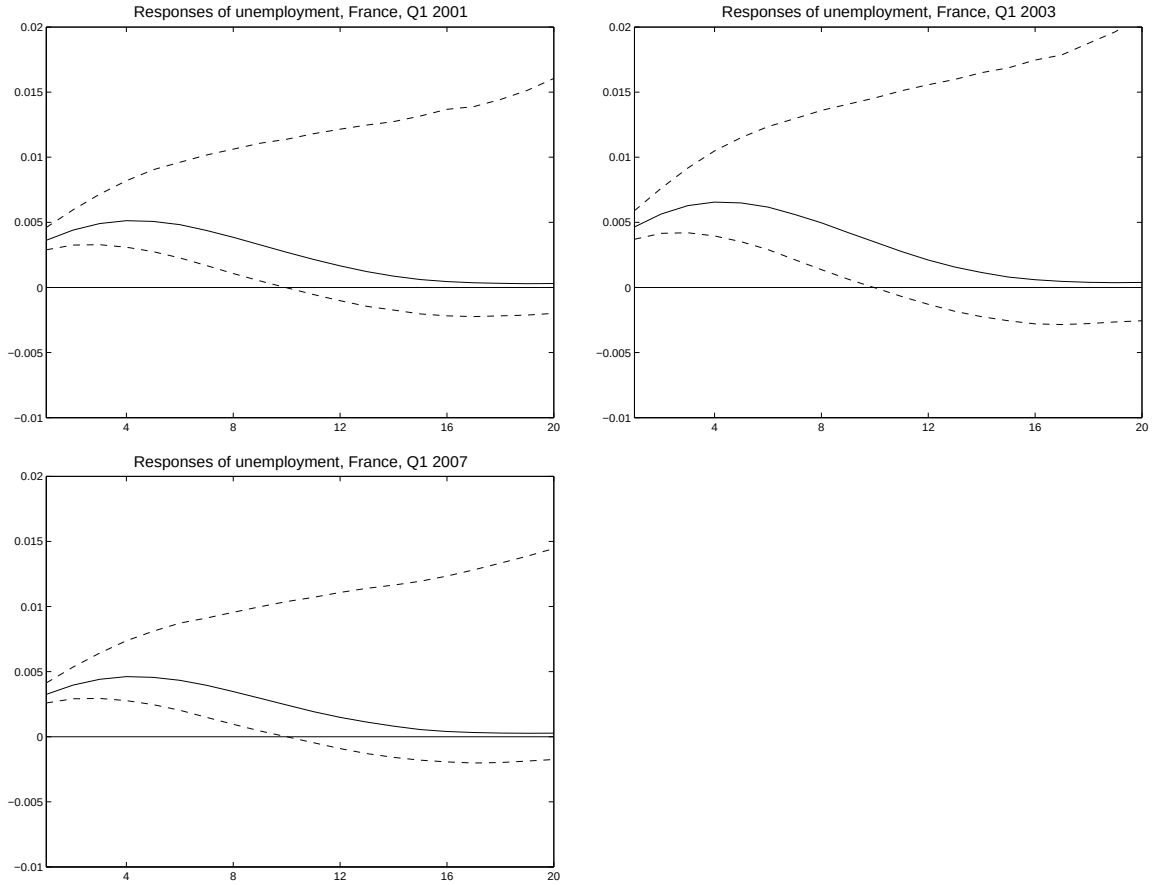

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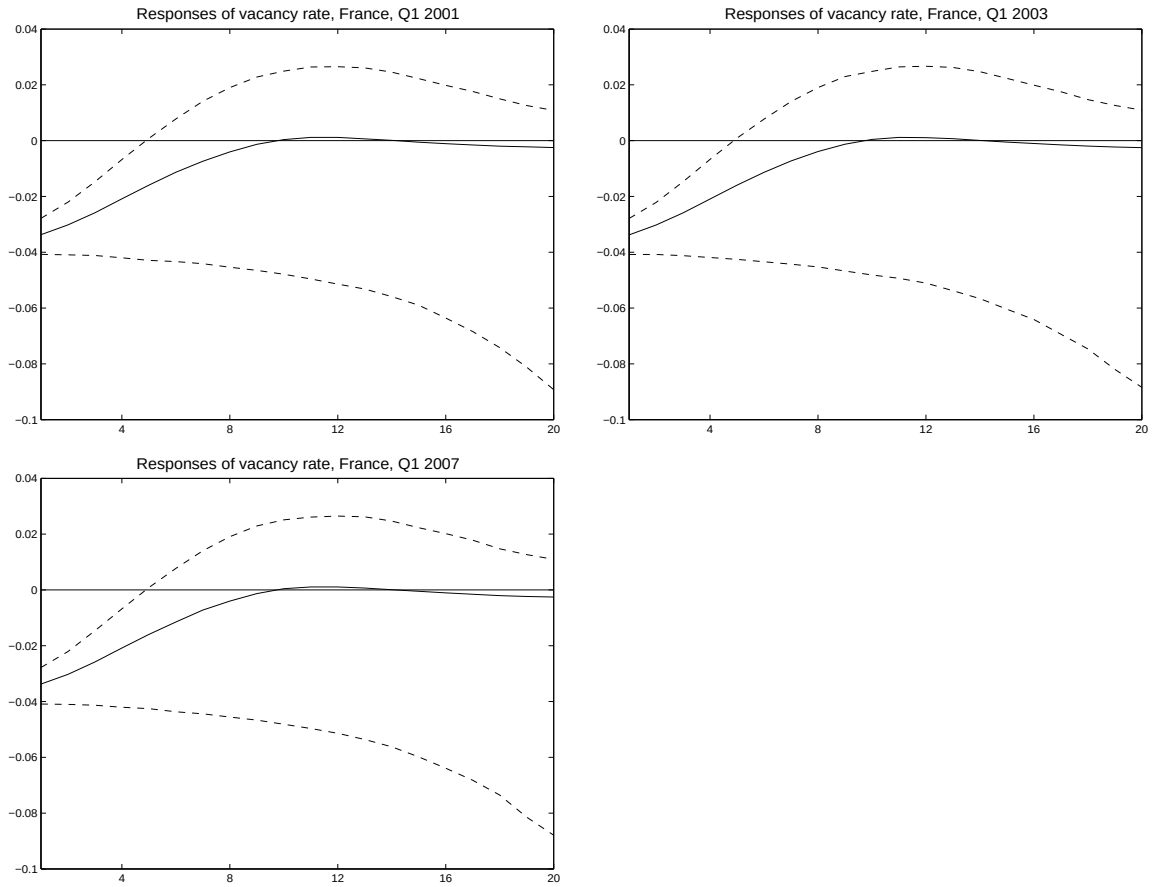

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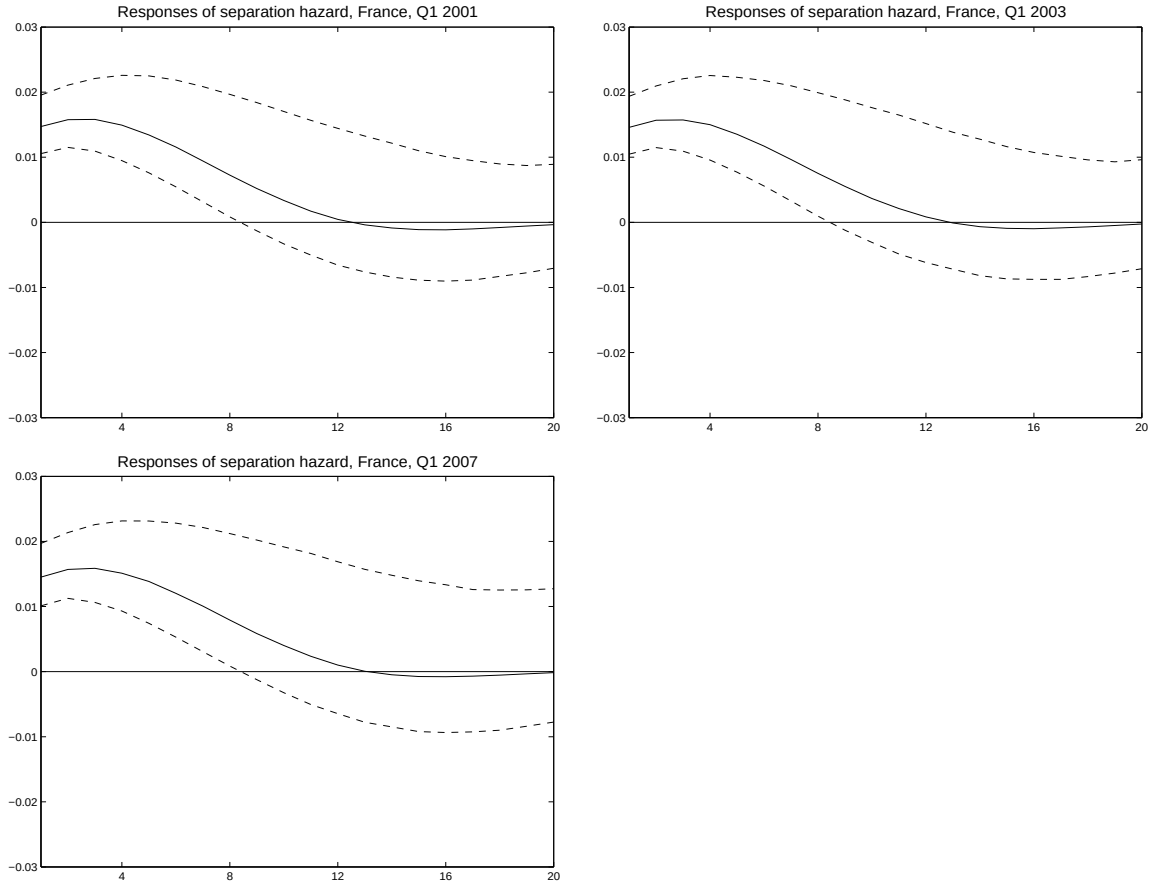

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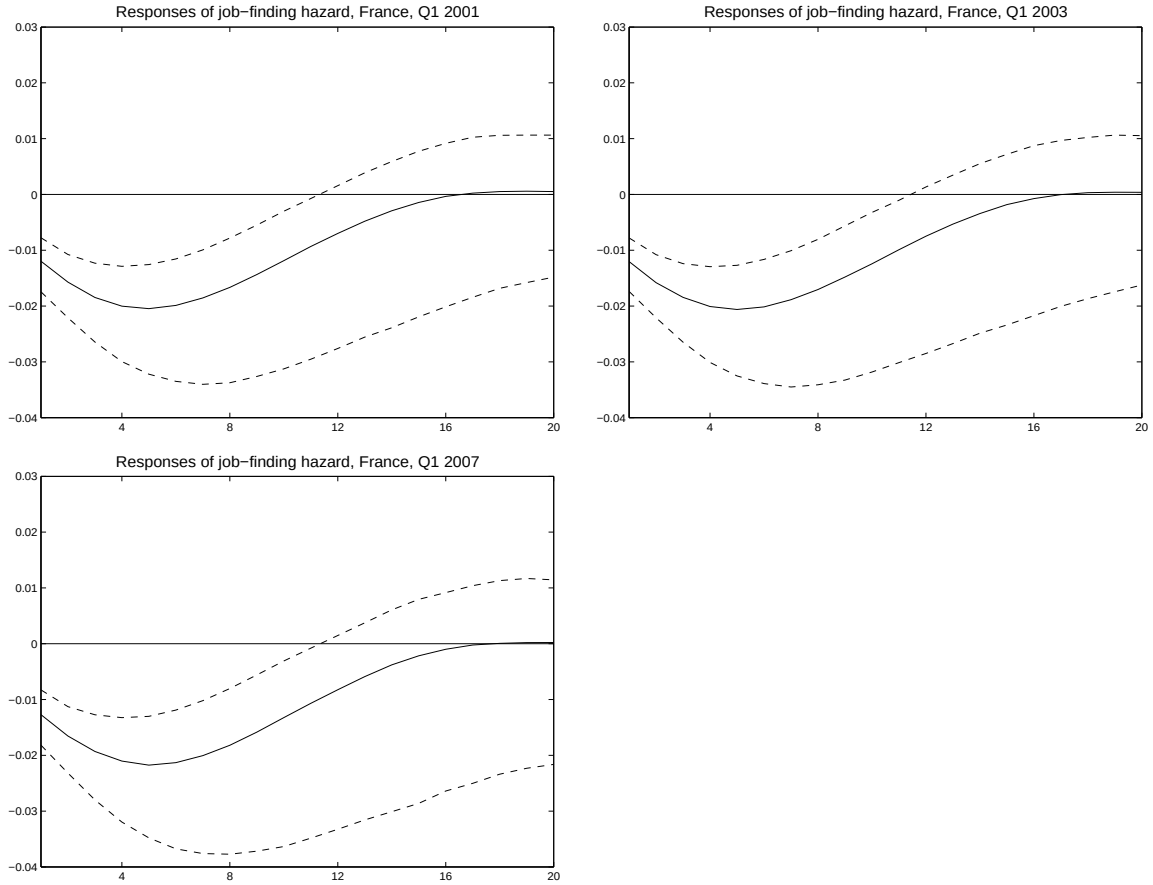

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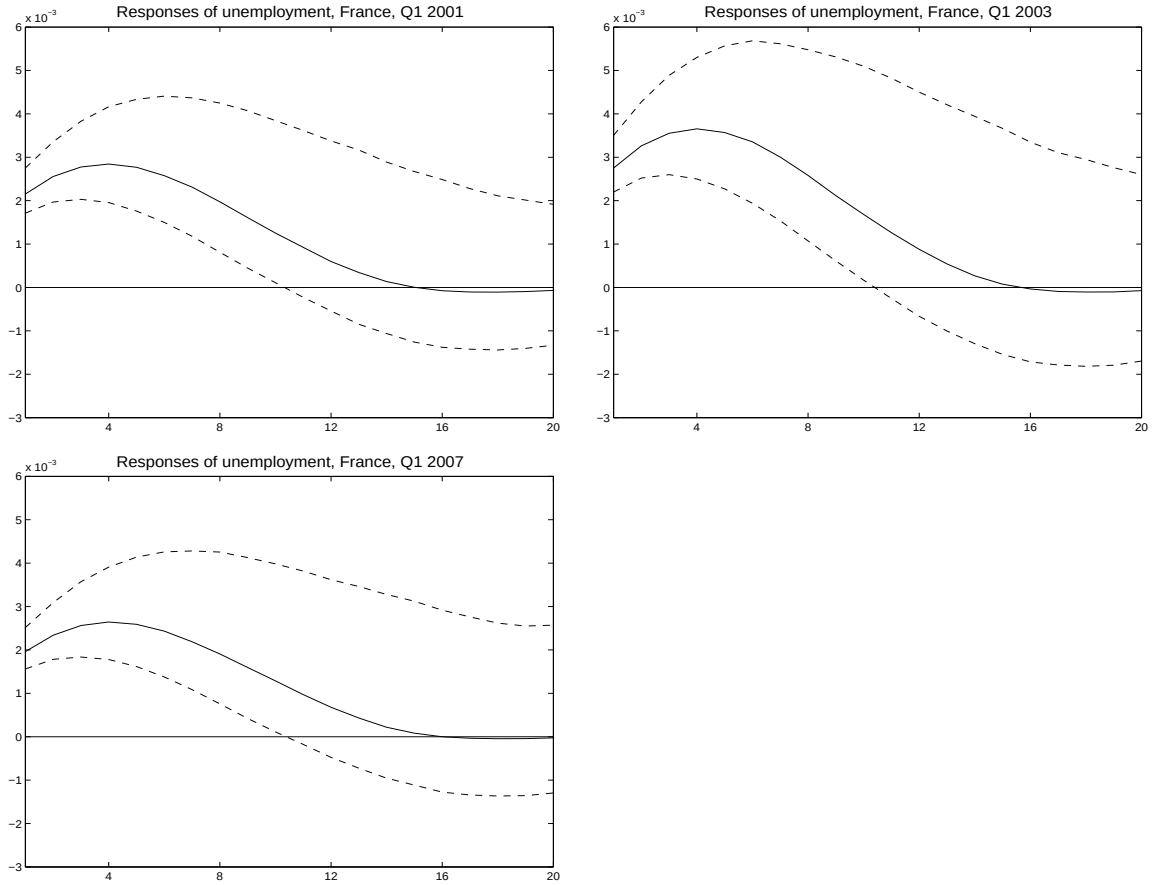

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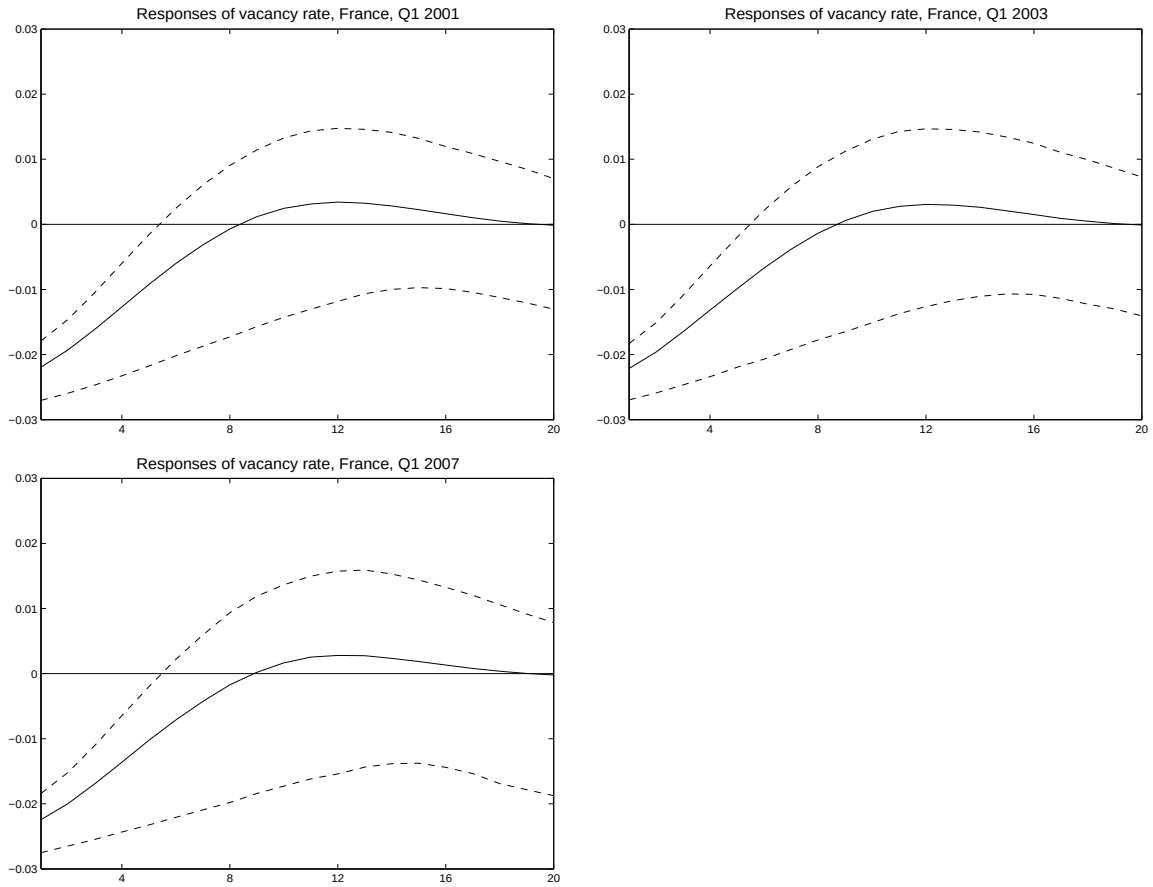

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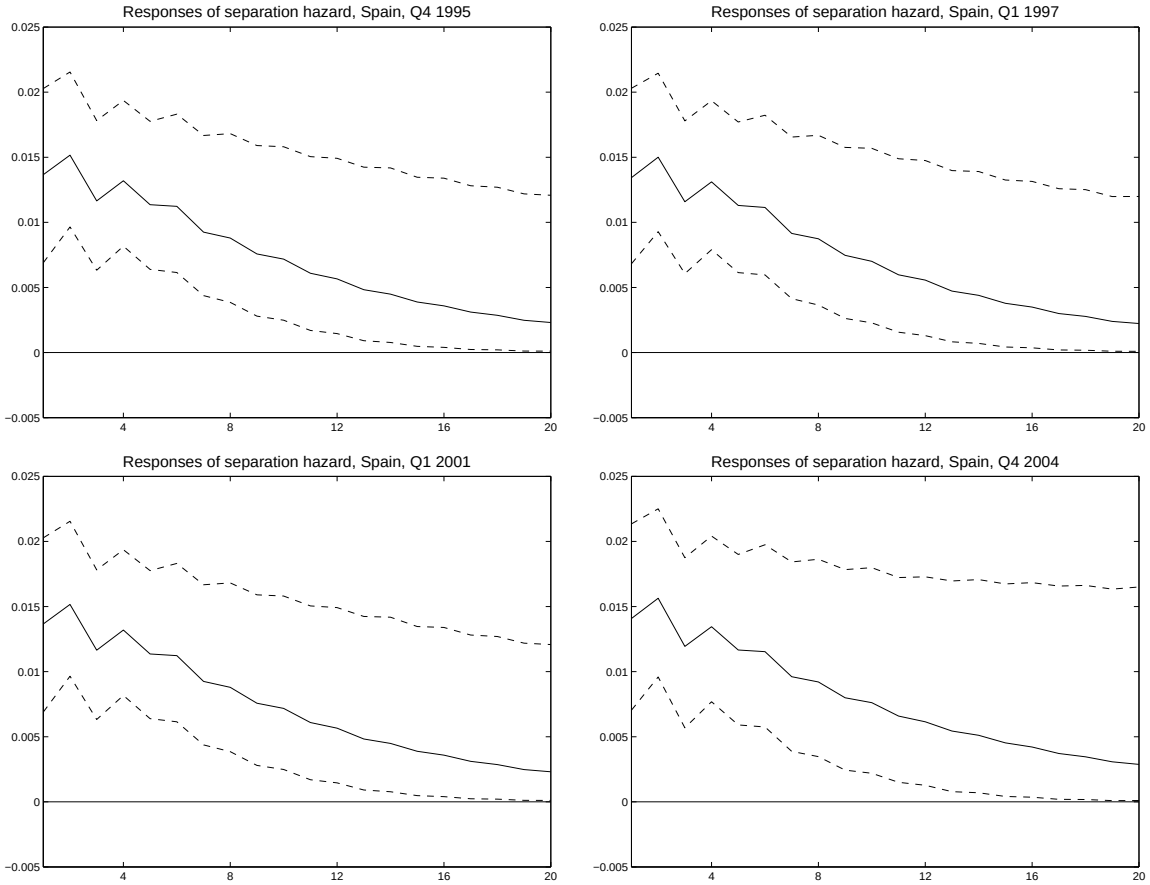


Figure D. 25. Impulse responses of separation hazards -*Homo TVP-VAR*, Spain

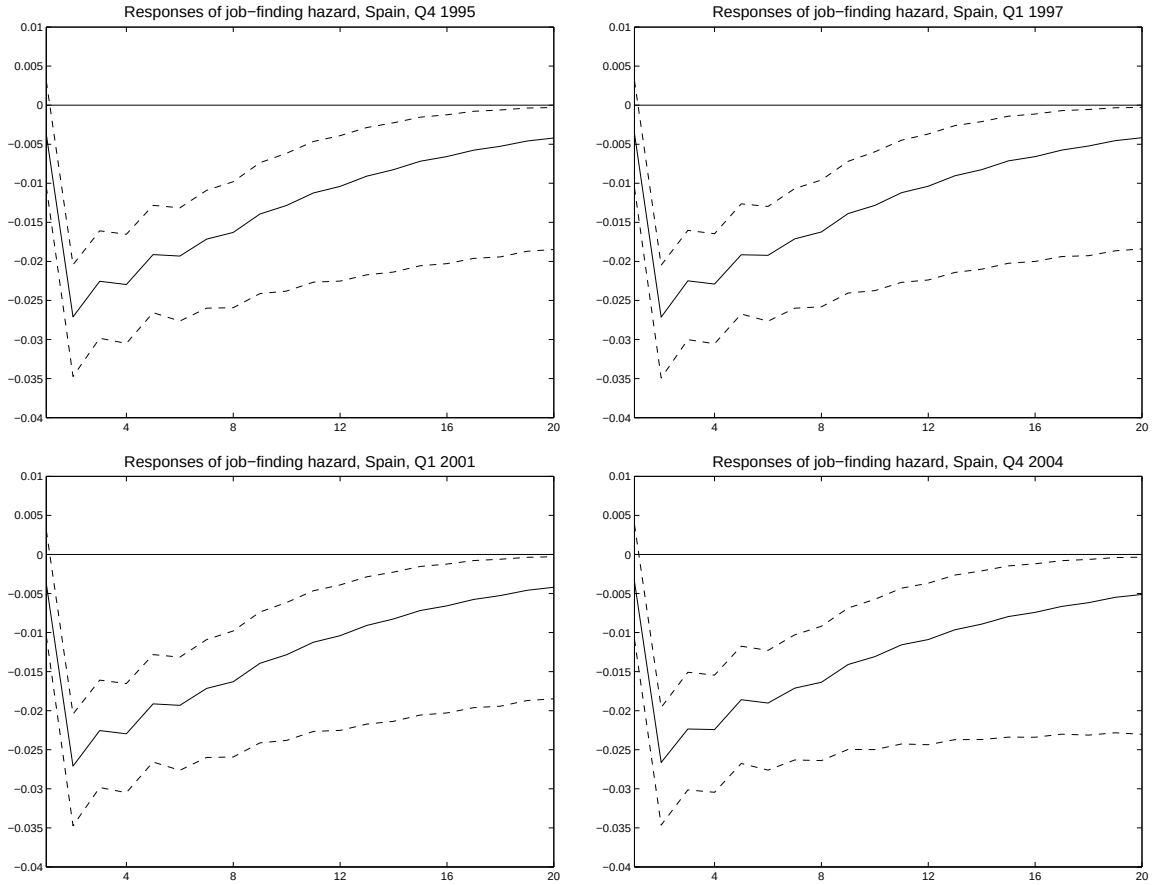


Figure D. 26. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

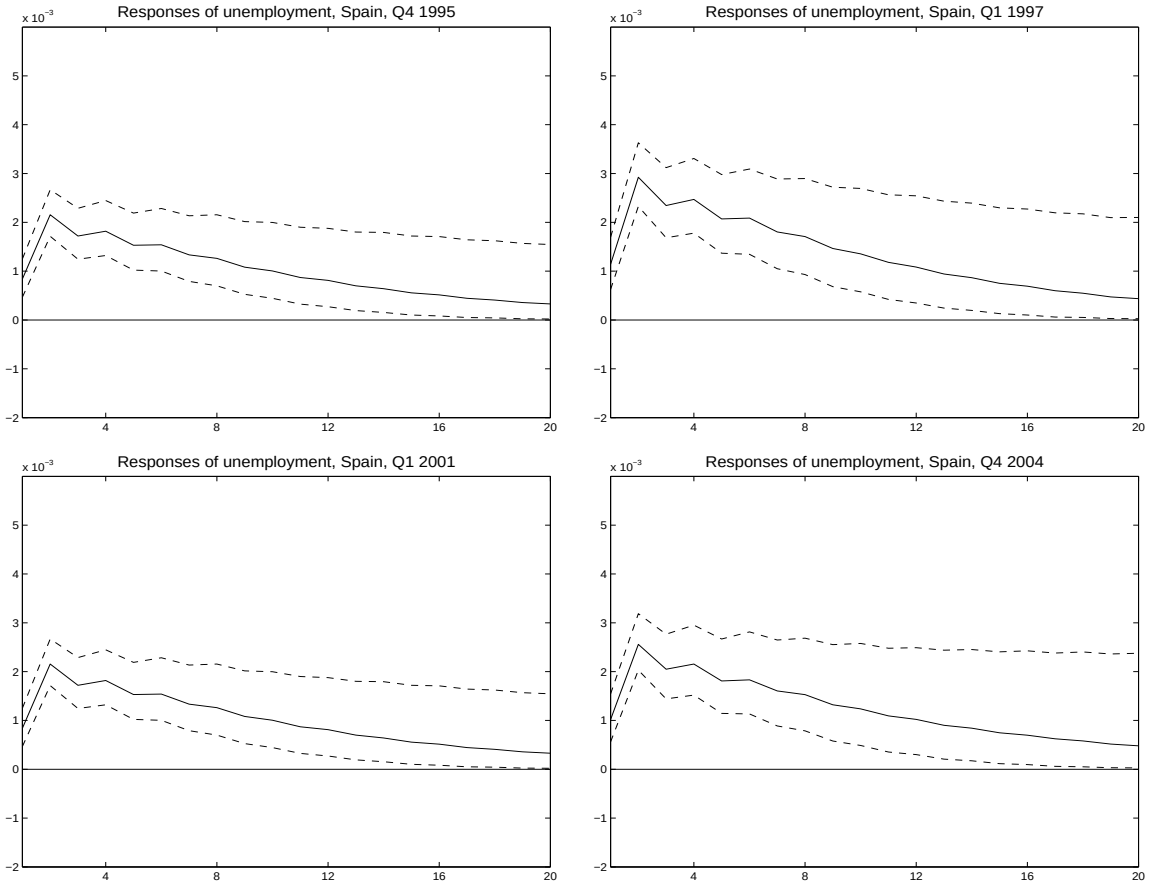
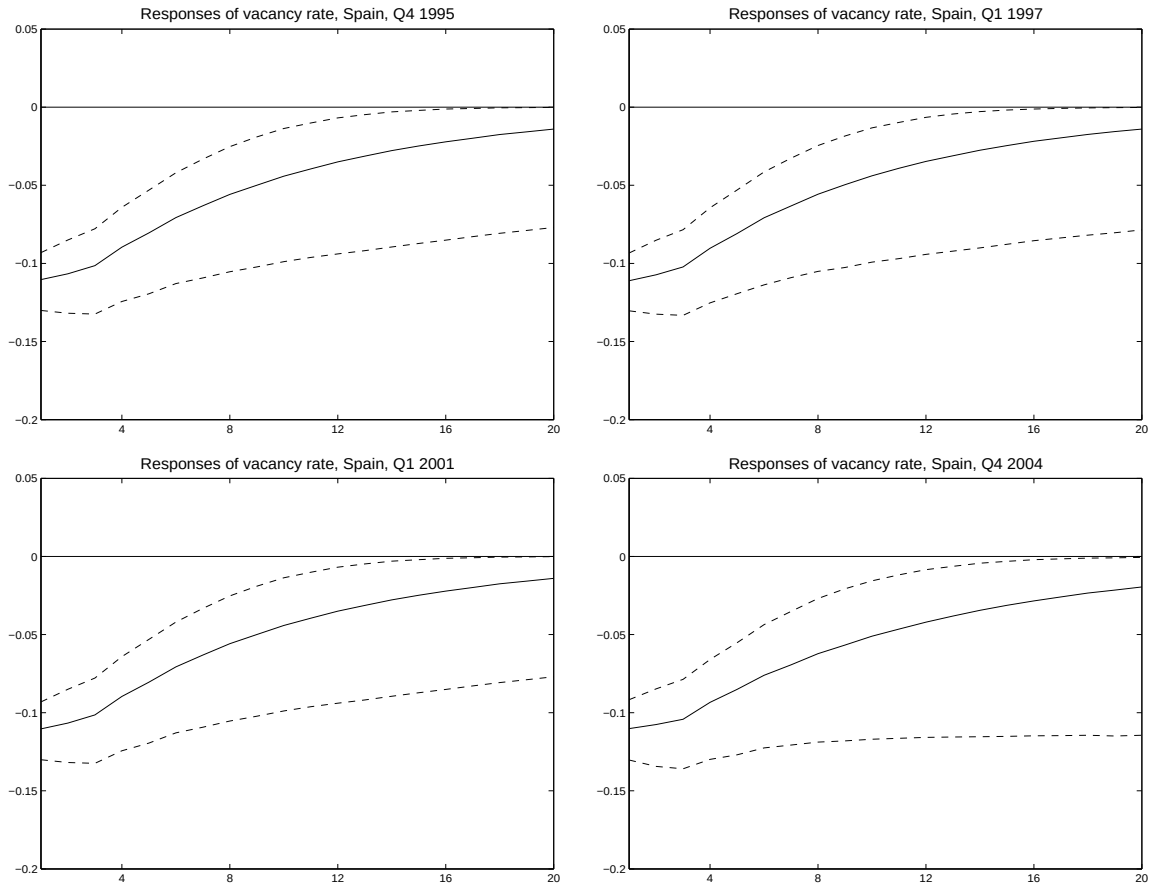


Figure D. 27. Impulse responses of unemployment rates -*Homo TVP-VAR*, Spain



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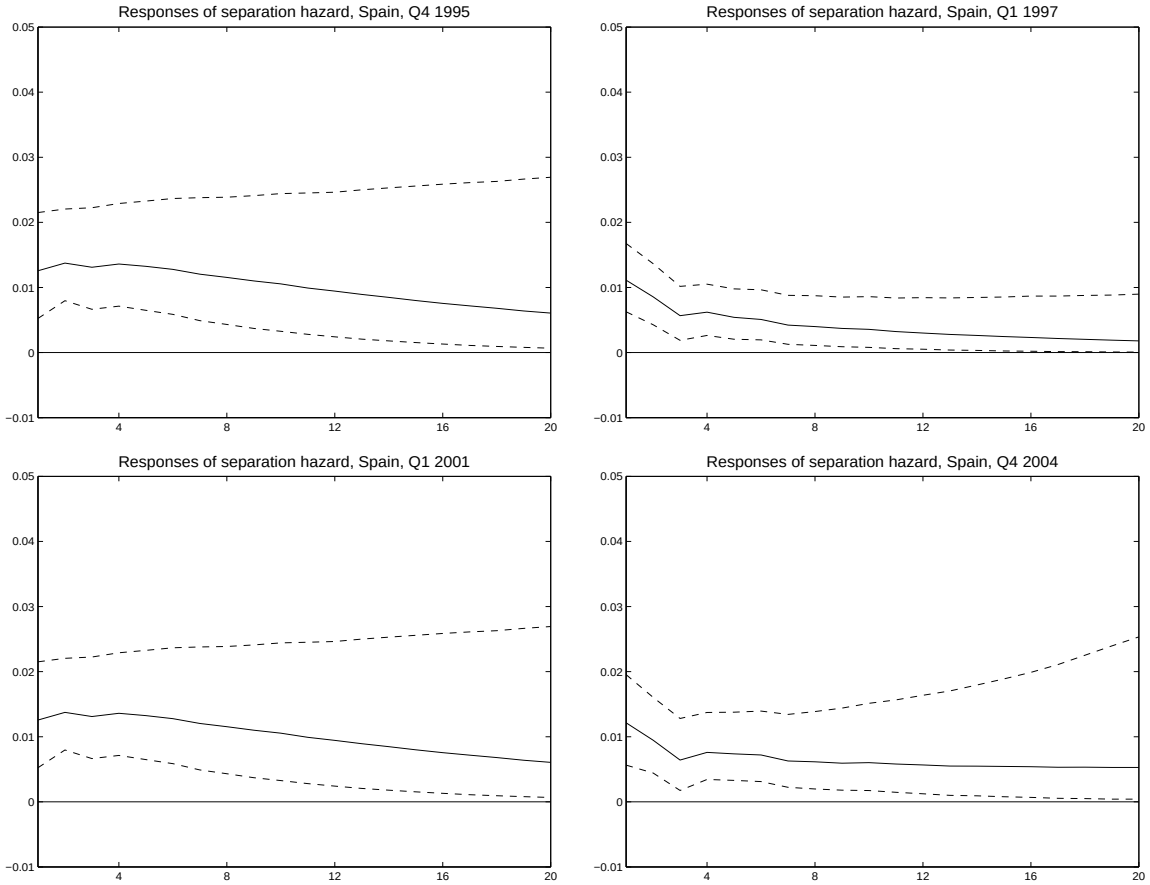


Figure D. 29. Impulse responses of separation hazards -*Hete TVP-VAR*, Spain

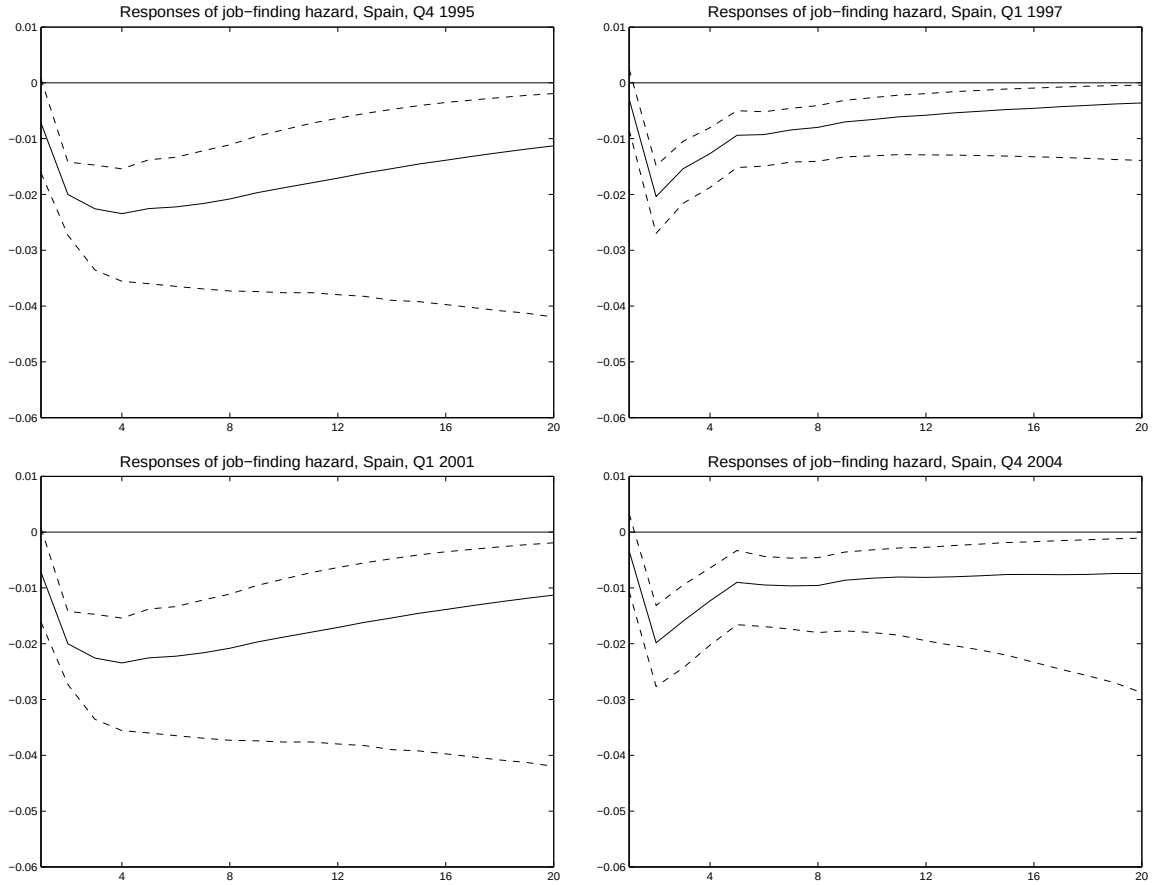


Figure D. 30. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

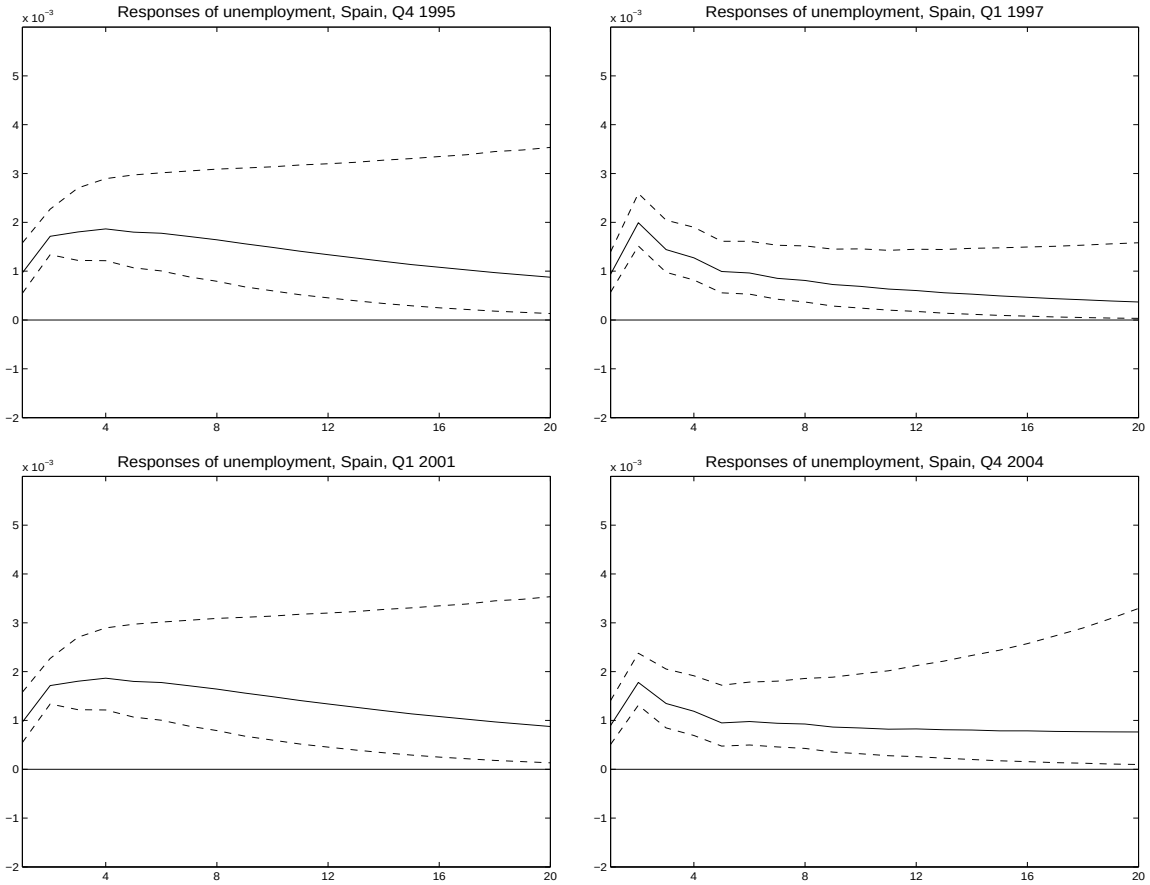


Figure D. 31. Impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

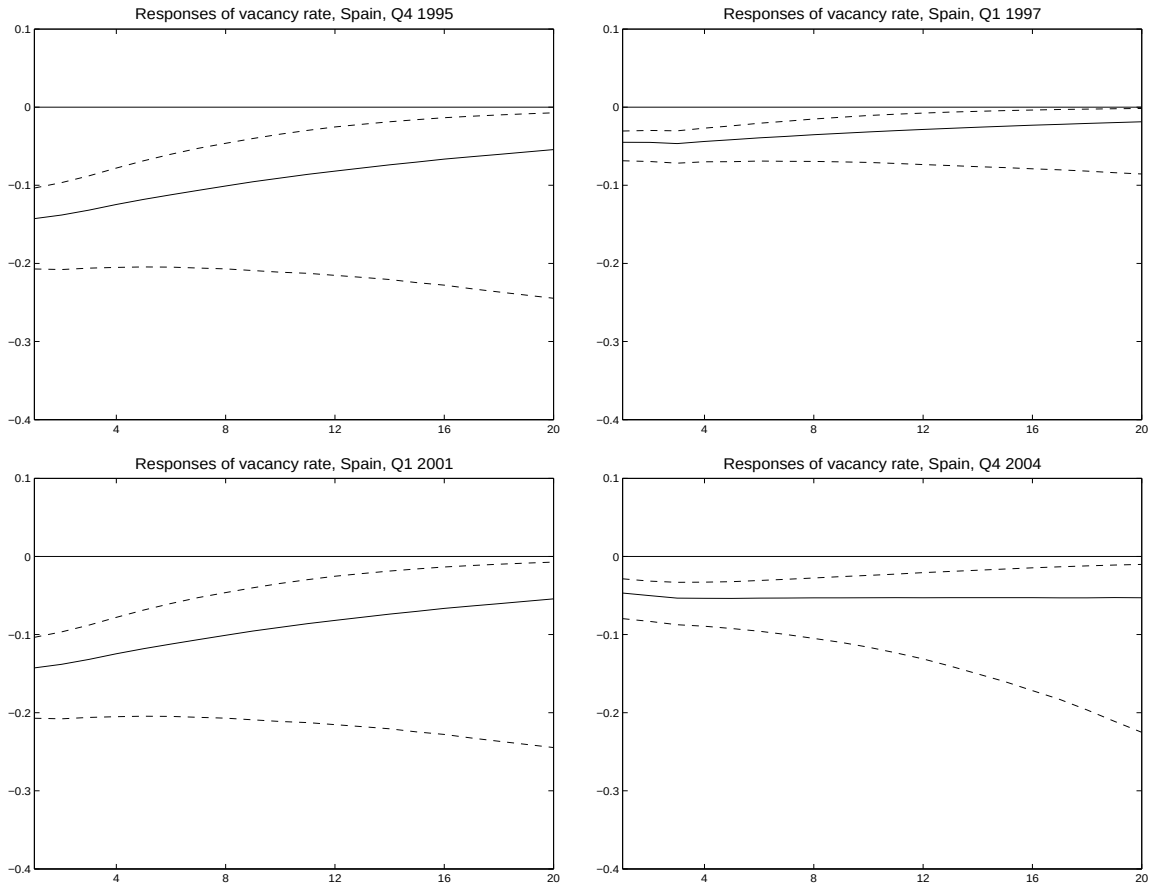


Figure D. 32. Impulse responses of vacancies -*Hete TVP-VAR*, Spain

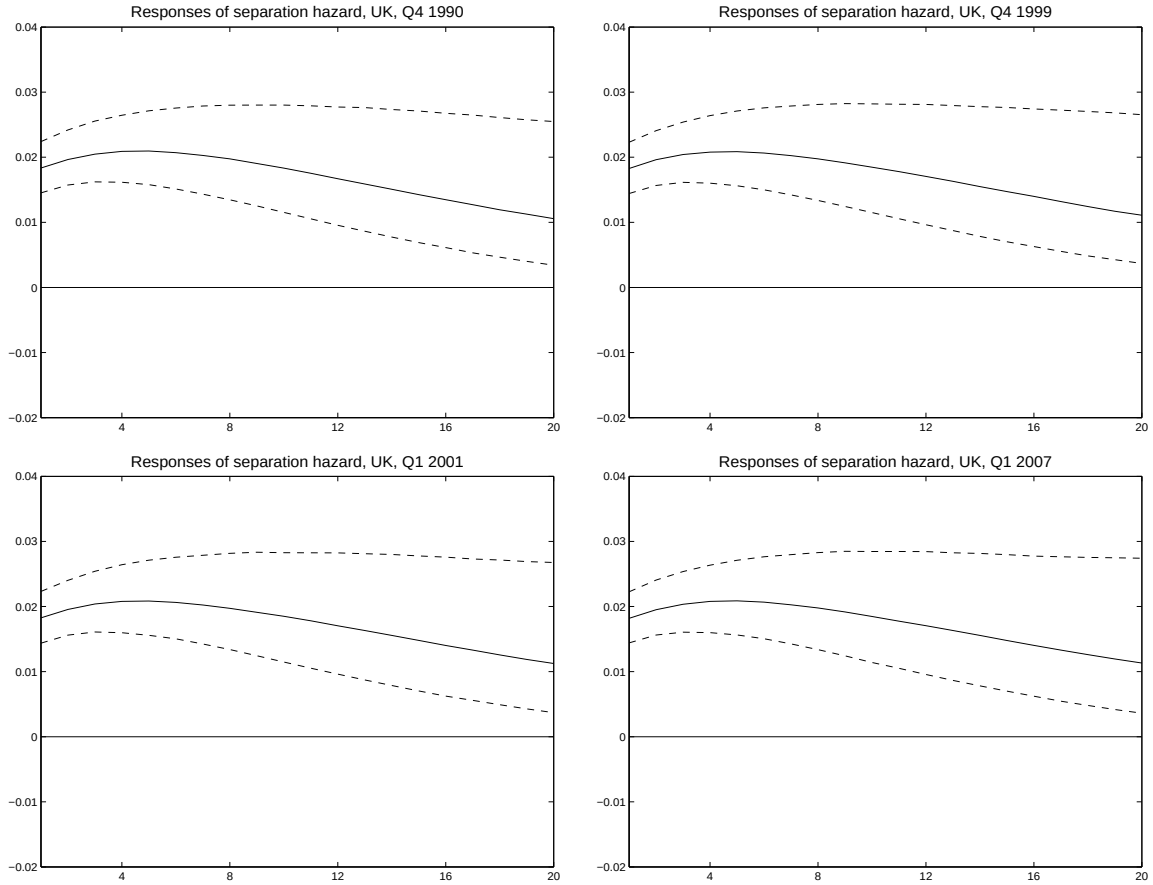


Figure D. 33. Impulse responses of separation hazards -*Homo TVP-VAR*, UK

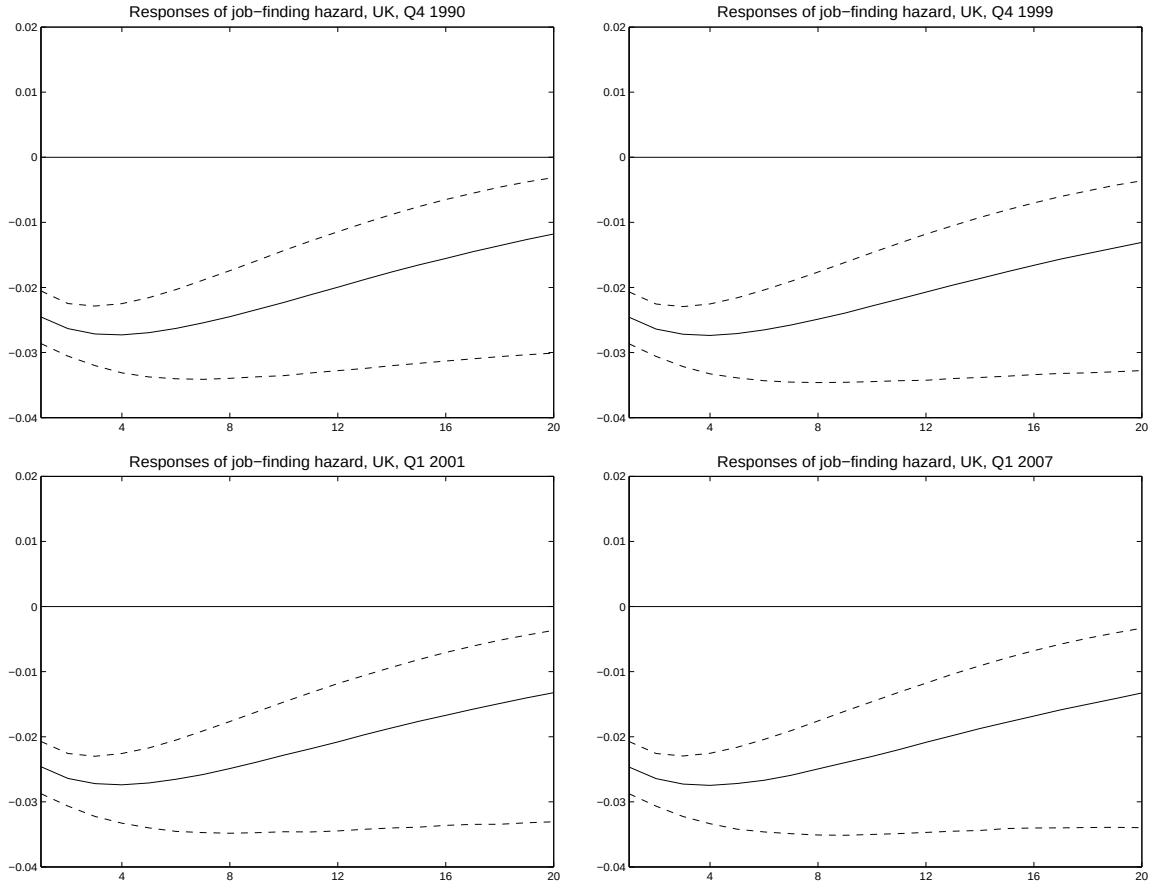


Figure D. 34. Impulse responses of job-finding hazards -*Homo TVP-VAR*, UK

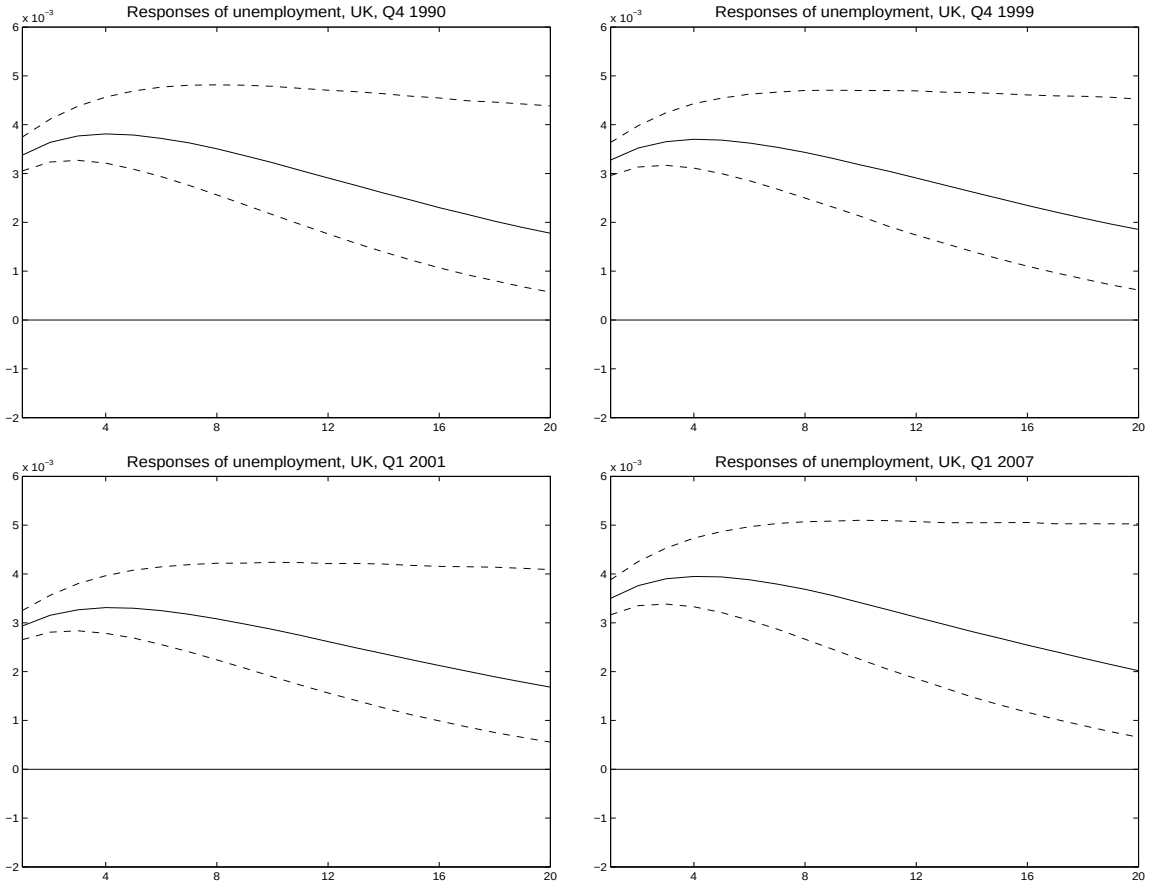


Figure D. 35. Impulse responses of unemployment rates -*Homo TVP-VAR*, UK

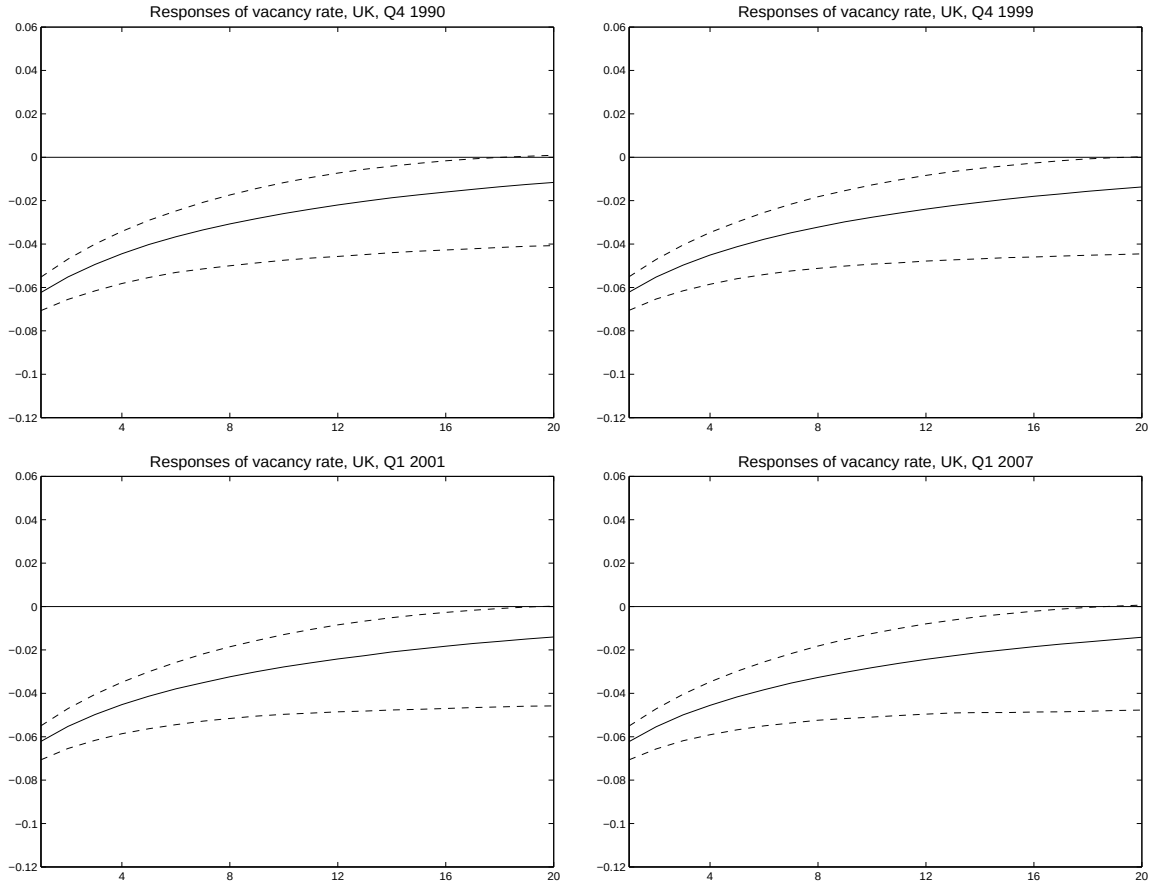


Figure D. 36. Impulse responses of vacancies -*Homo TVP-VAR*, UK

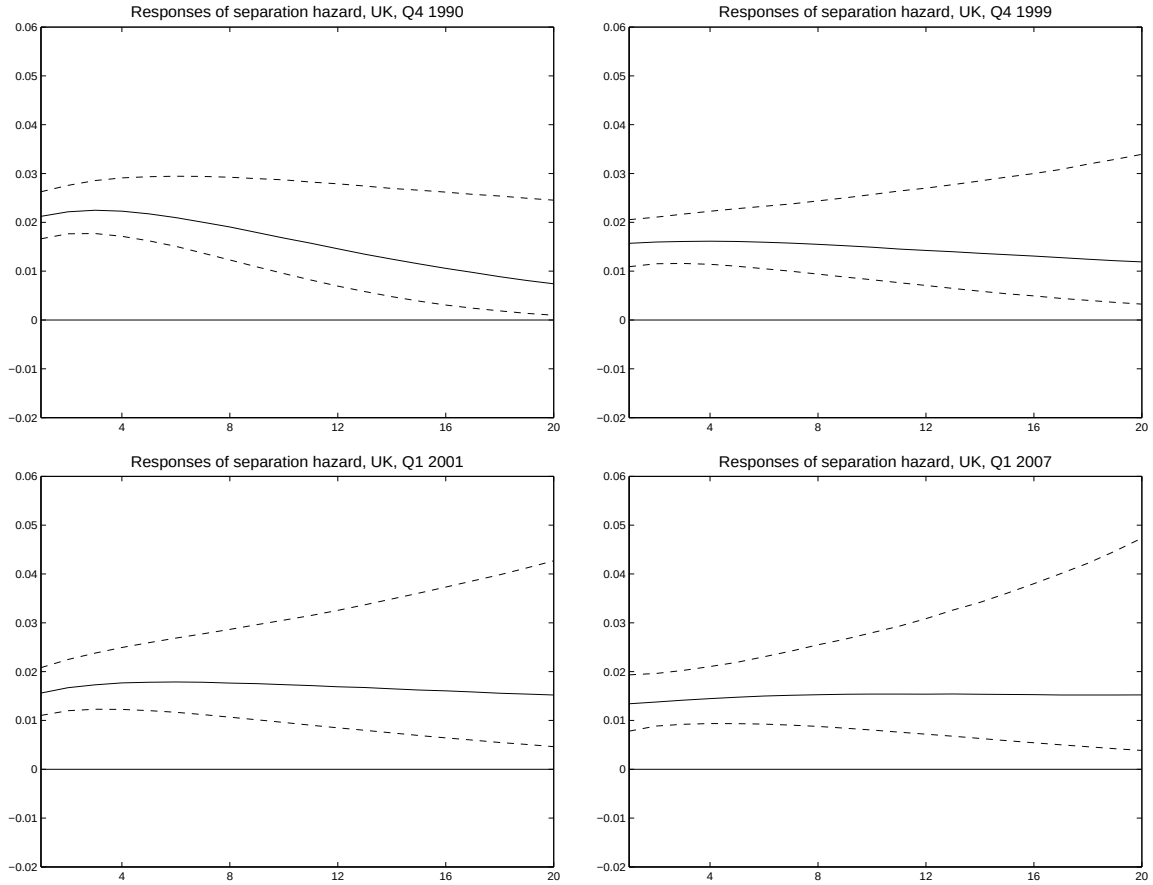


Figure D. 37. Impulse responses of separation hazards -*Hete TVP-VAR*, UK

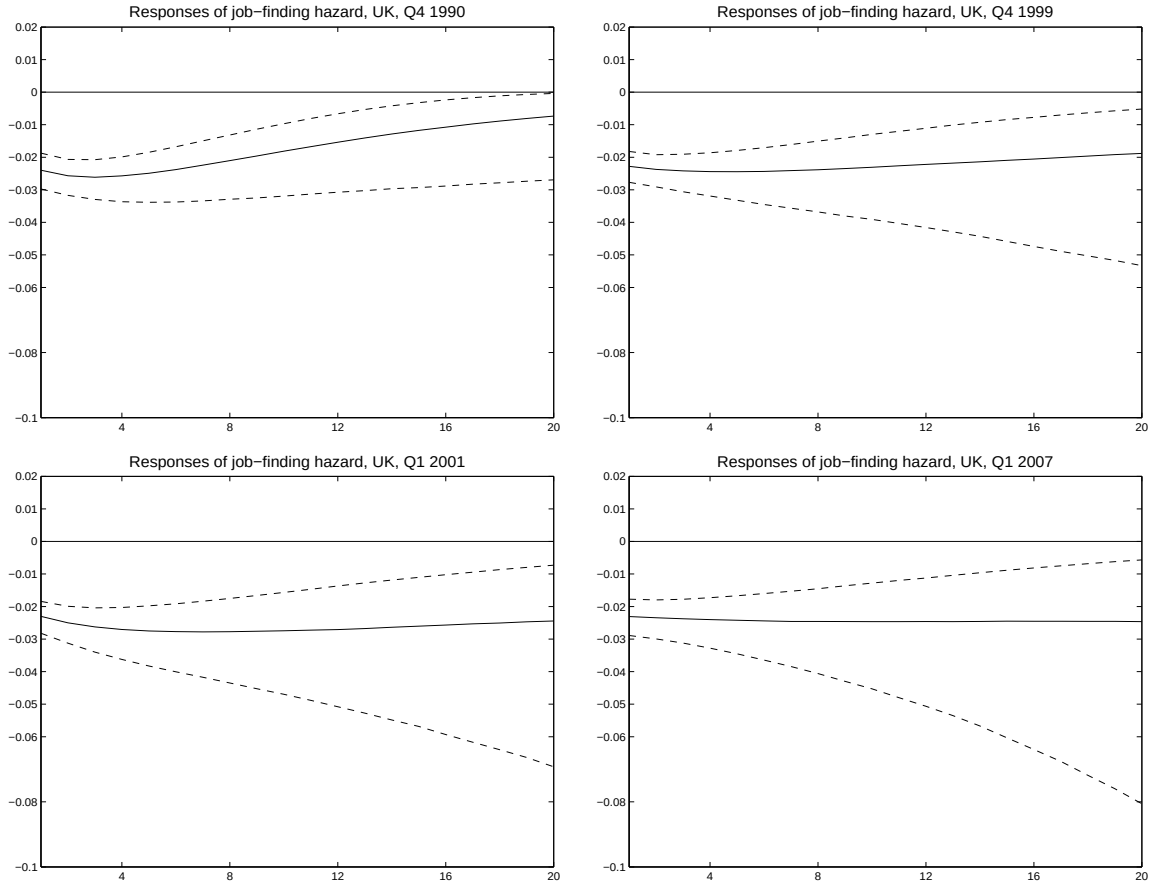


Figure D. 38. Impulse responses of job-finding hazards -*Hete TVP-VAR*, UK

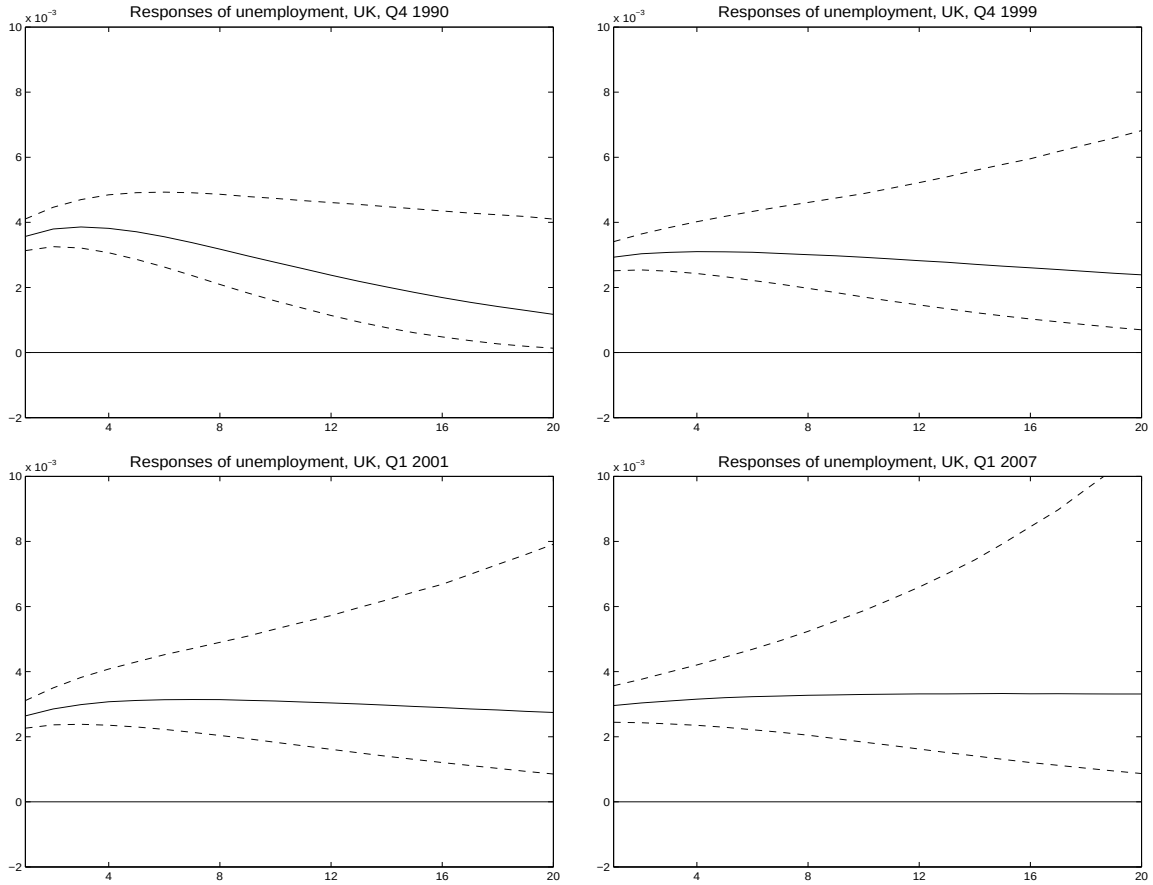


Figure D. 39. Impulse responses of unemployment rates -*Hete TVP-VAR*, UK

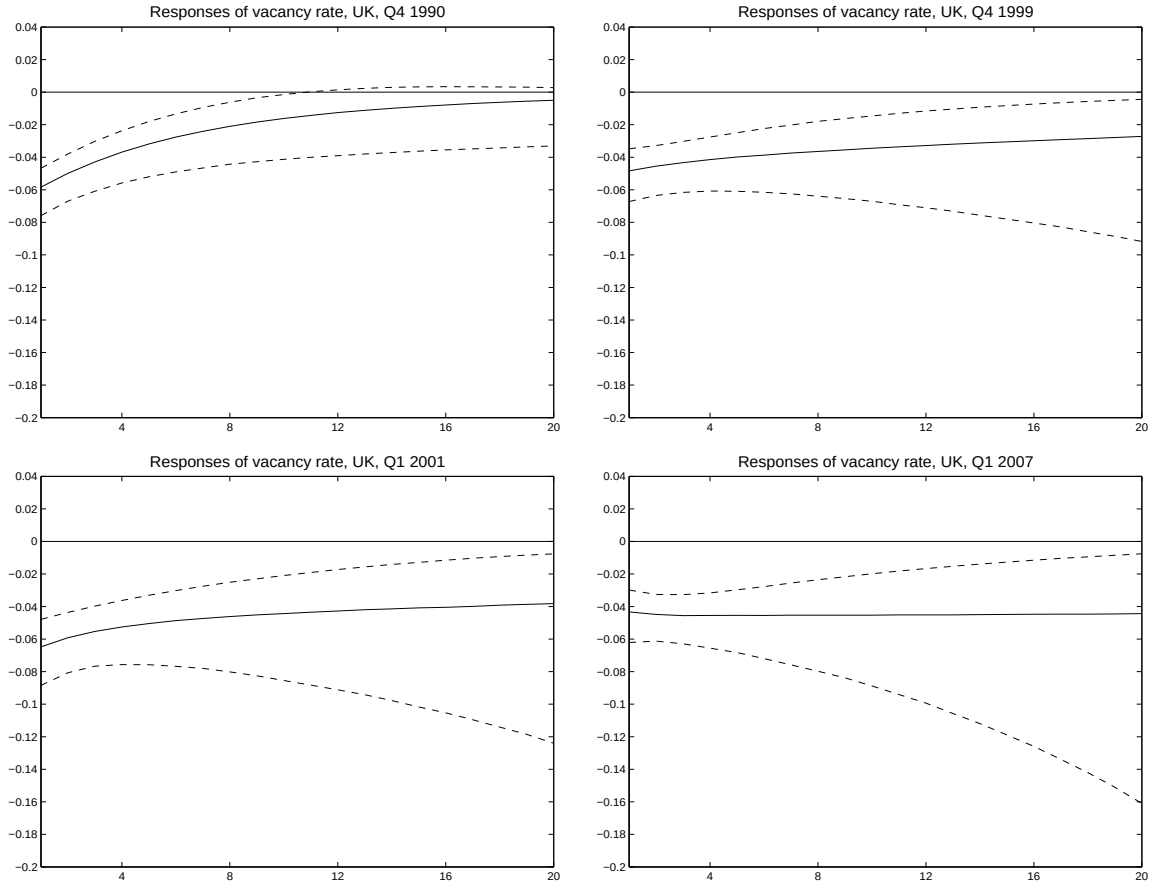


Figure D. 40. Impulse responses of vacancies -*Hete TVP-VAR*, UK

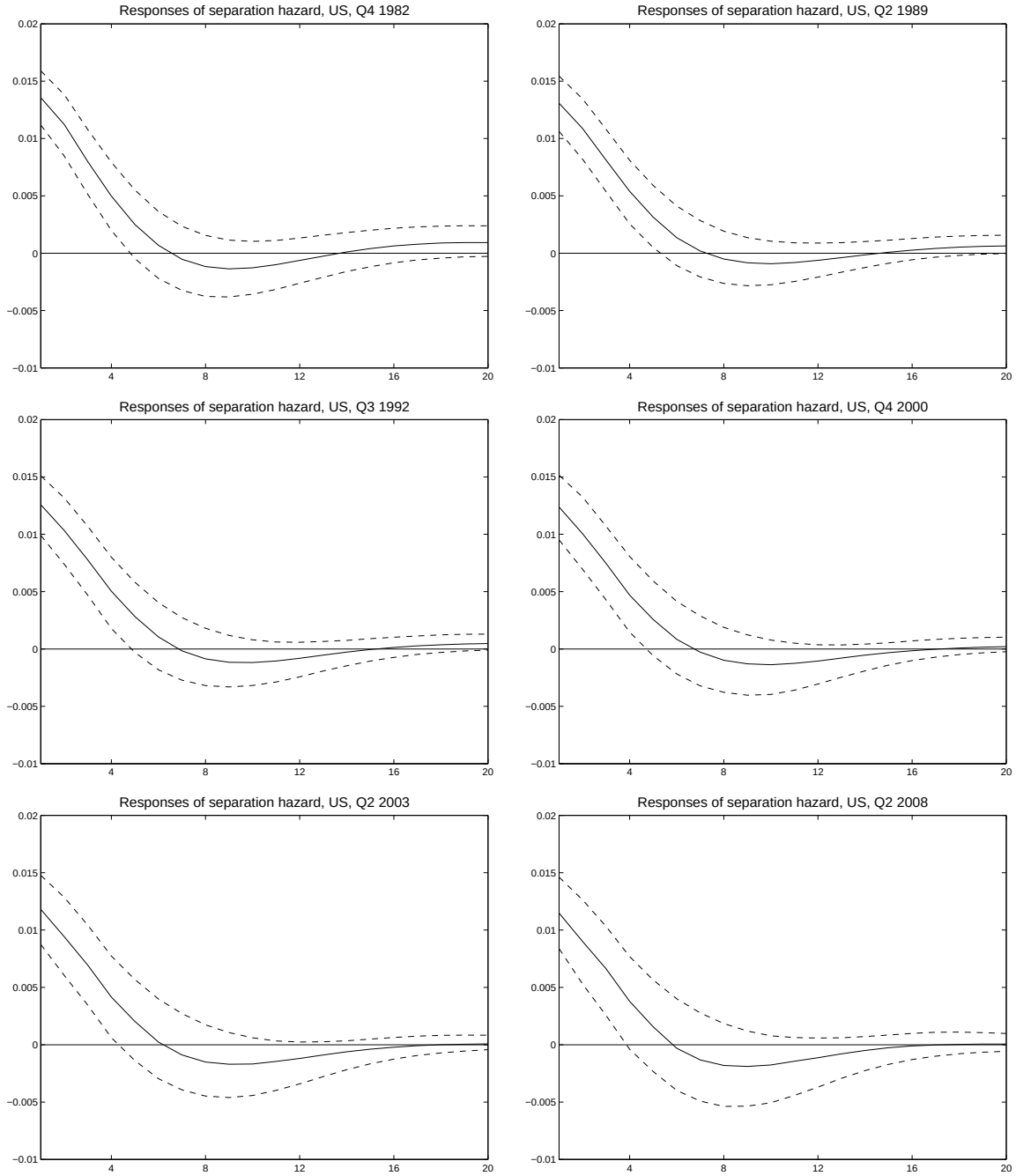


Figure E. 1. Impulse responses of separation hazards -*Homo TVP-VAR*, US

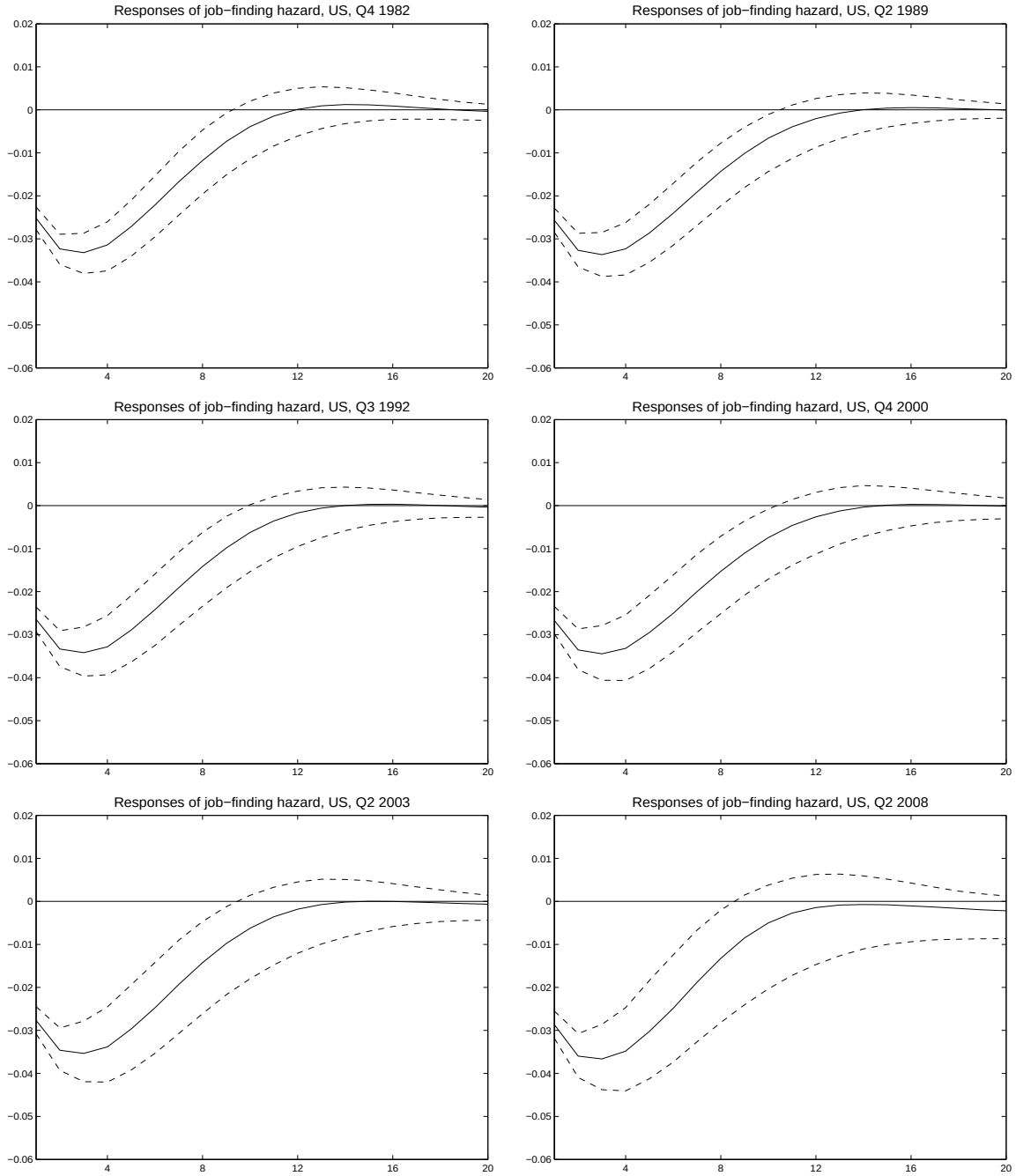


Figure E. 2. Impulse responses of job-finding hazards -*Homo TVP-VAR*, US

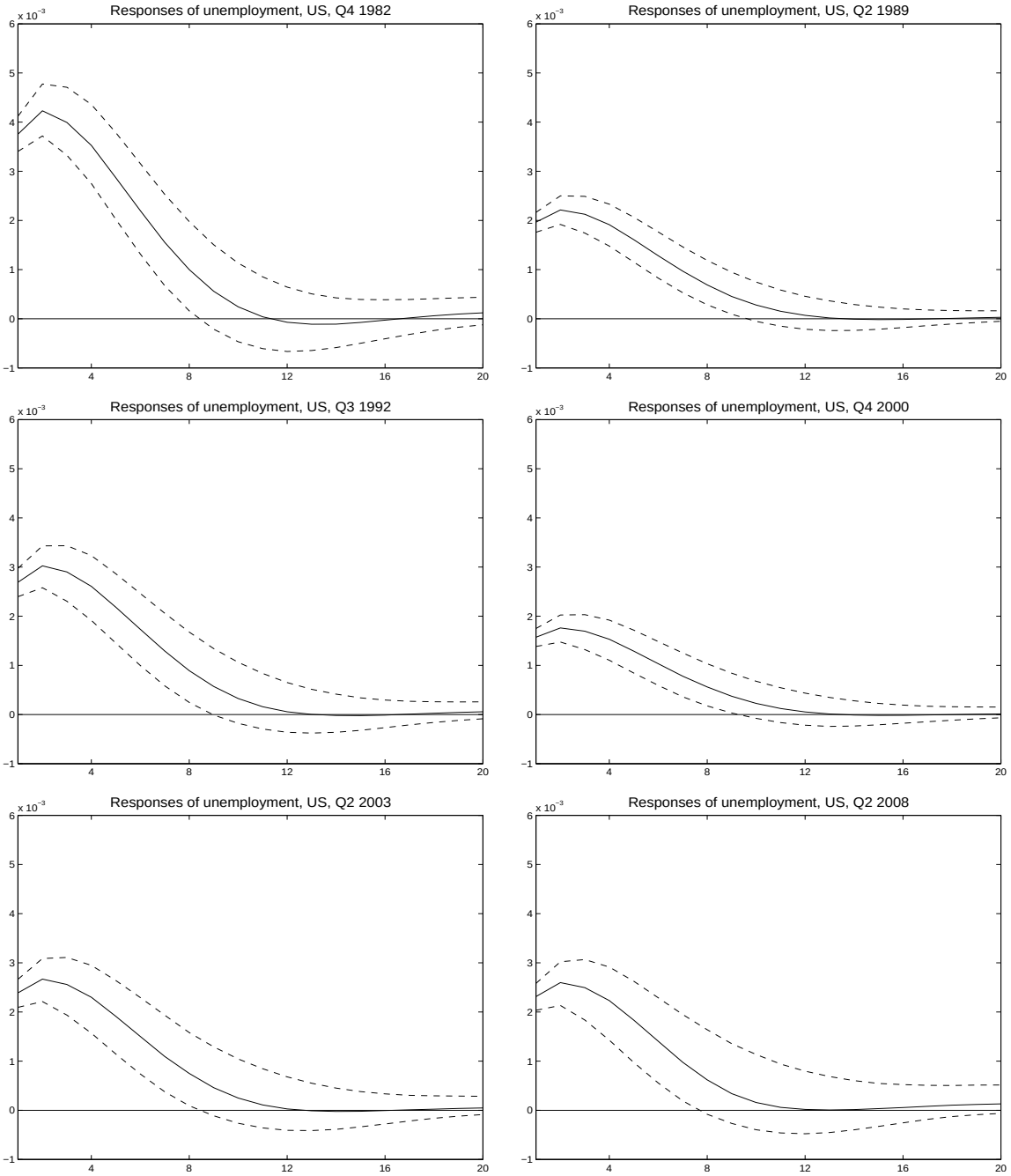


Figure E. 3. Impulse responses of unemployment rates -*Homo TVP-VAR*, US

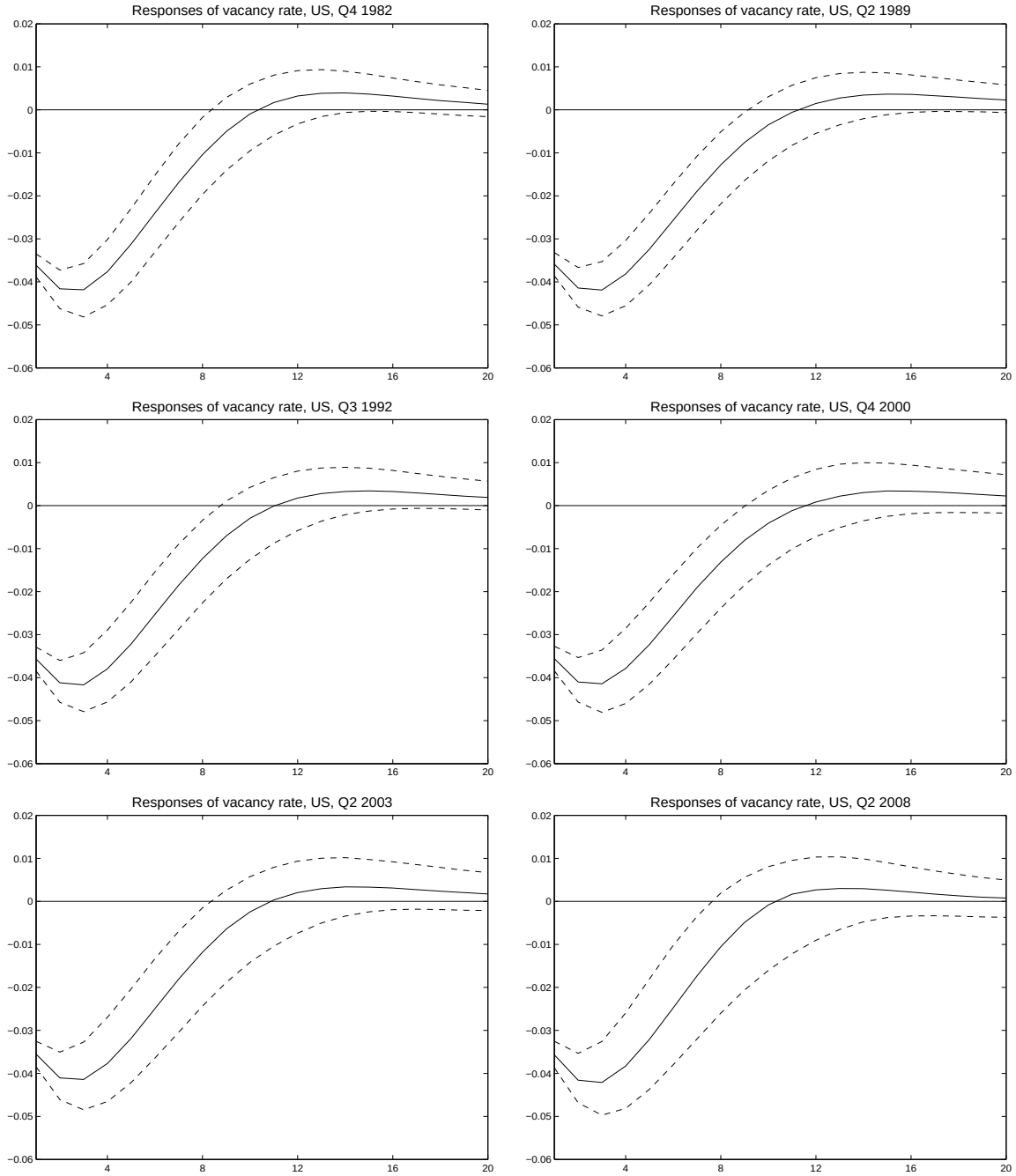


Figure E. 4. Impulse responses of vacancies -*Homo TVP-VAR*, US

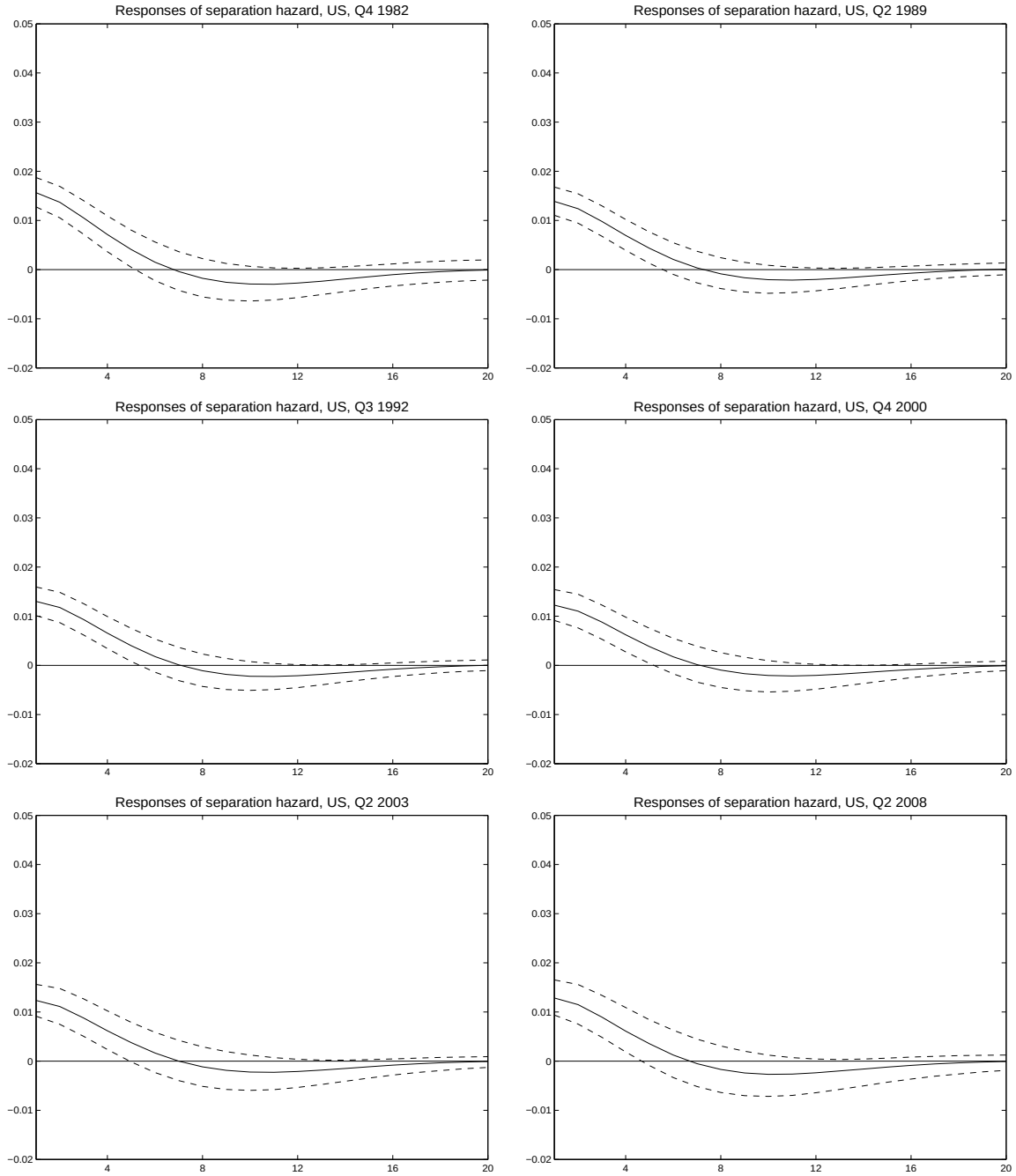


Figure E. 5. Impulse responses of separation hazards -*Hete TVP-VAR*, US

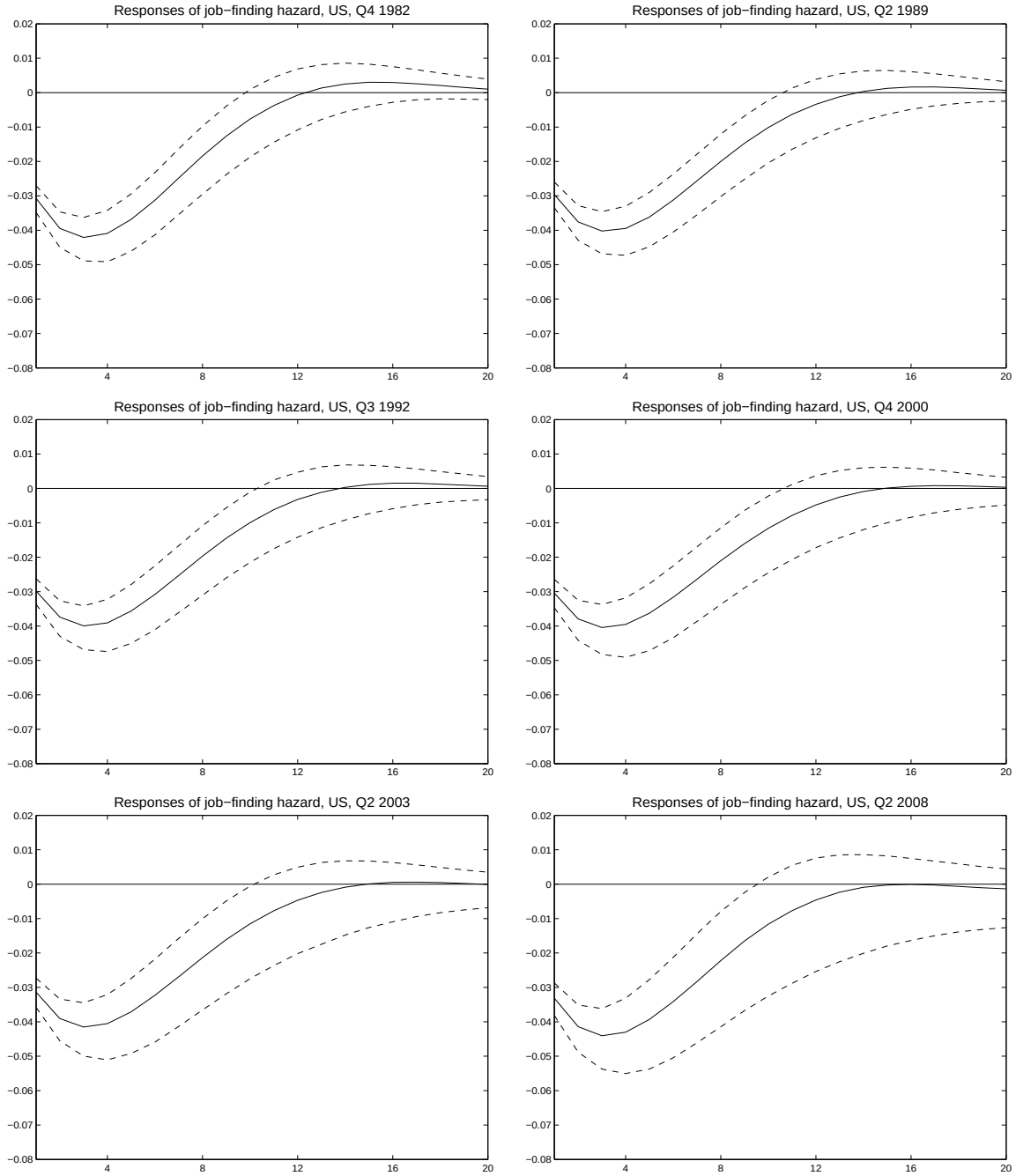


Figure E. 6. Impulse responses of job-finding hazards -*Hete TVP-VAR*, US

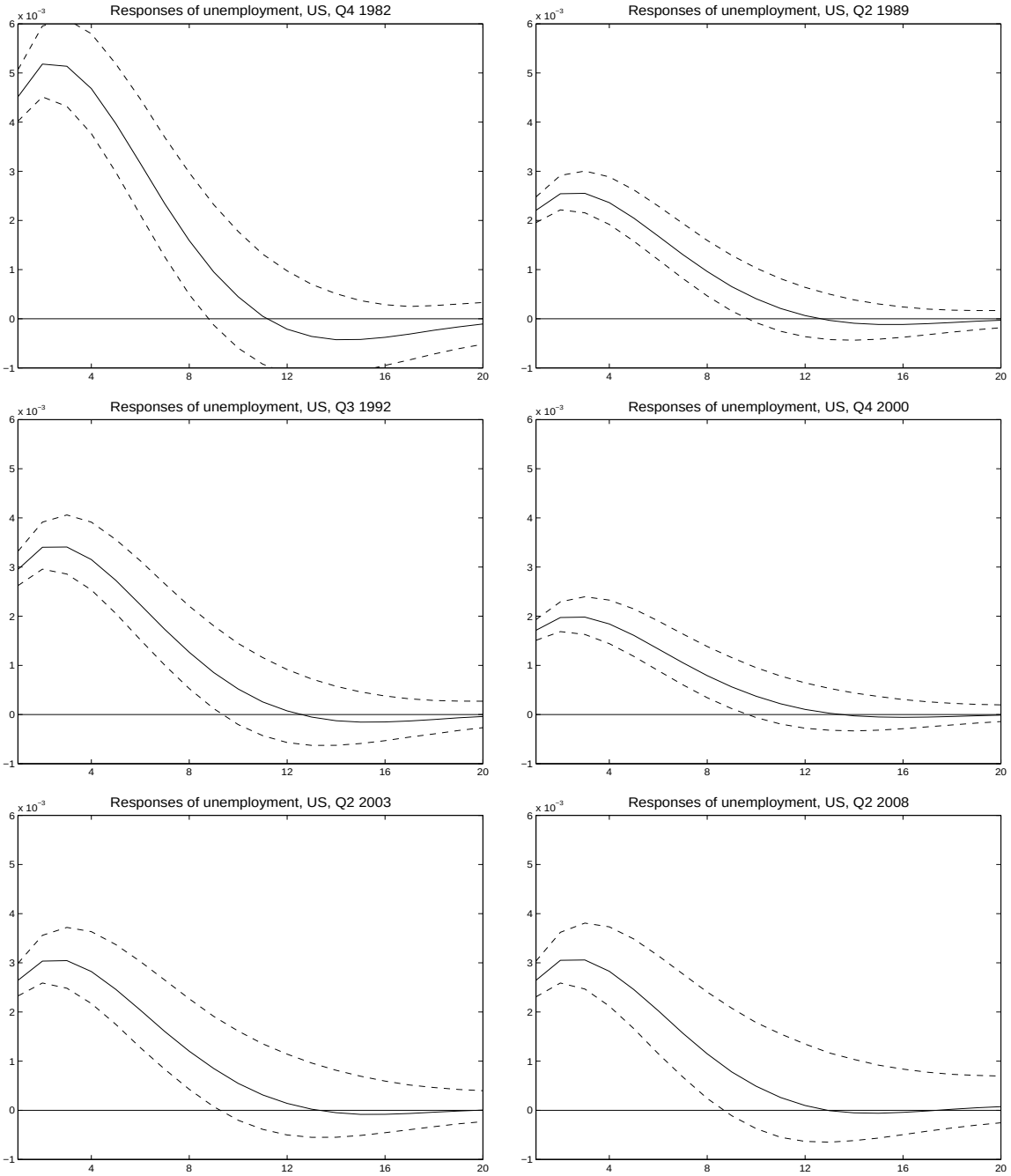


Figure E. 7. Impulse responses of unemployment rates -*Hete TVP-VAR*, US

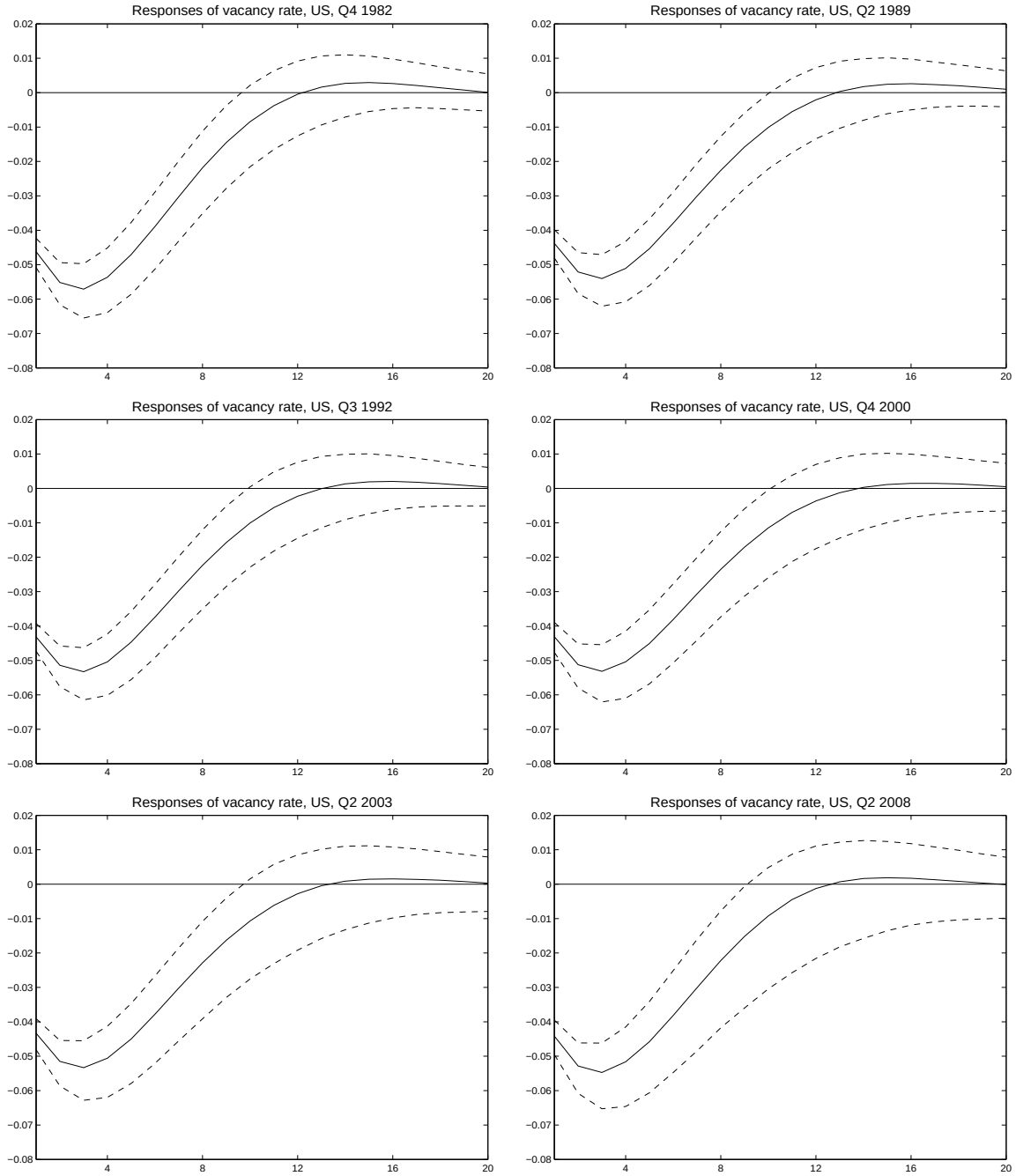


Figure E. 8. Impulse responses of vacancies -*Hete TVP-VAR*, US

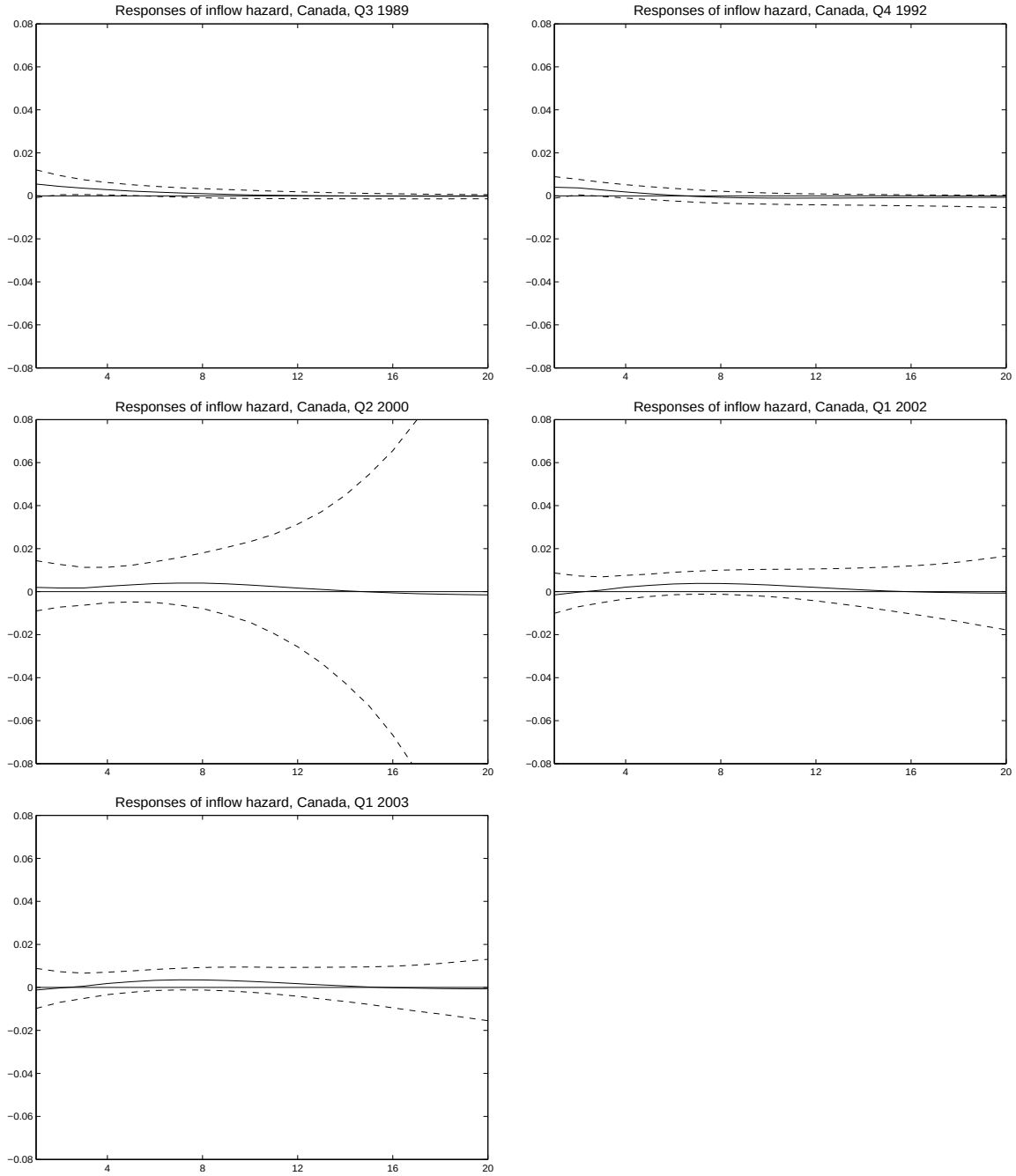


Figure E. 9. Impulse responses of separation hazards -*Homo TVP-VAR*, Canada

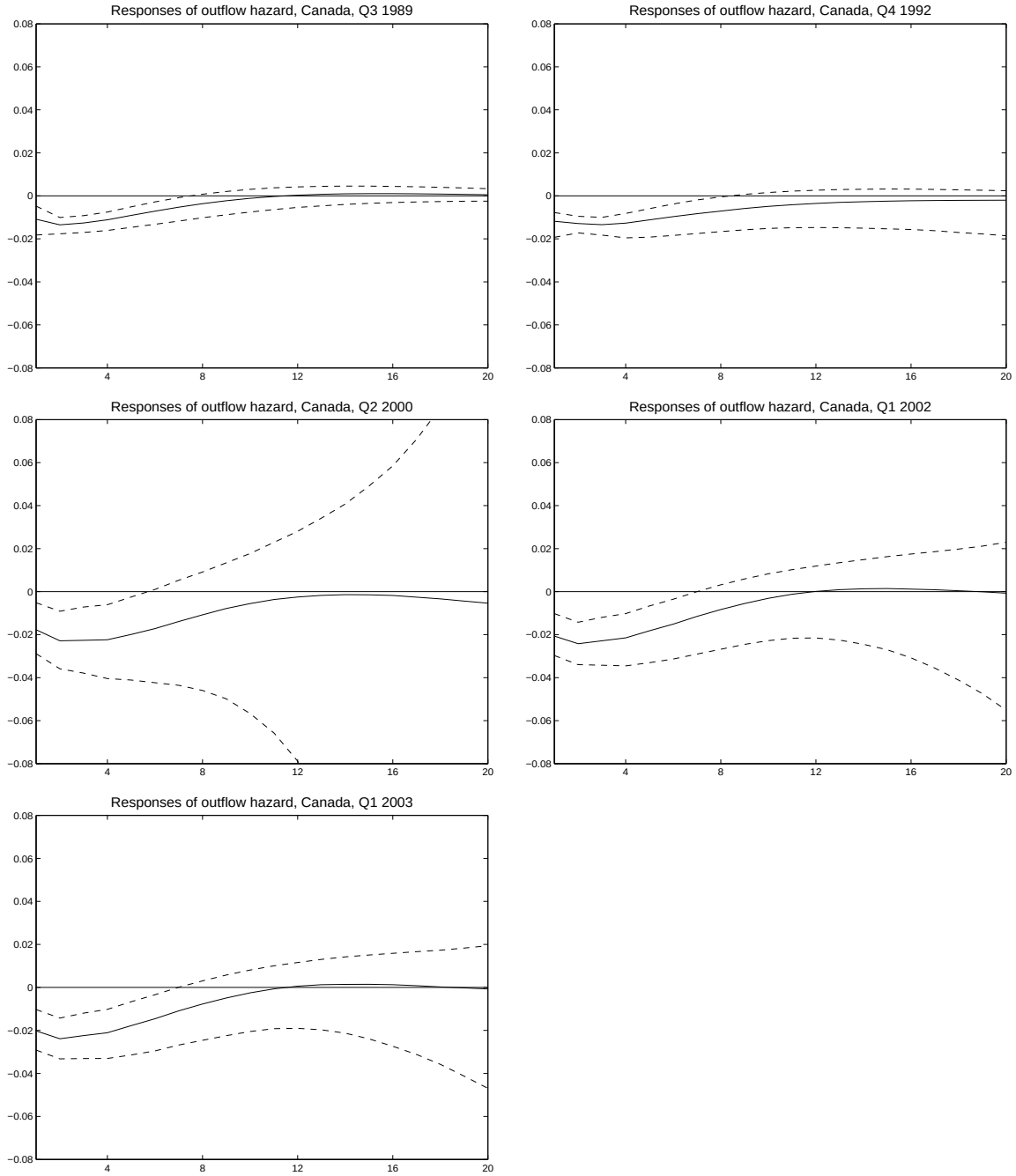


Figure E. 10. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Canada

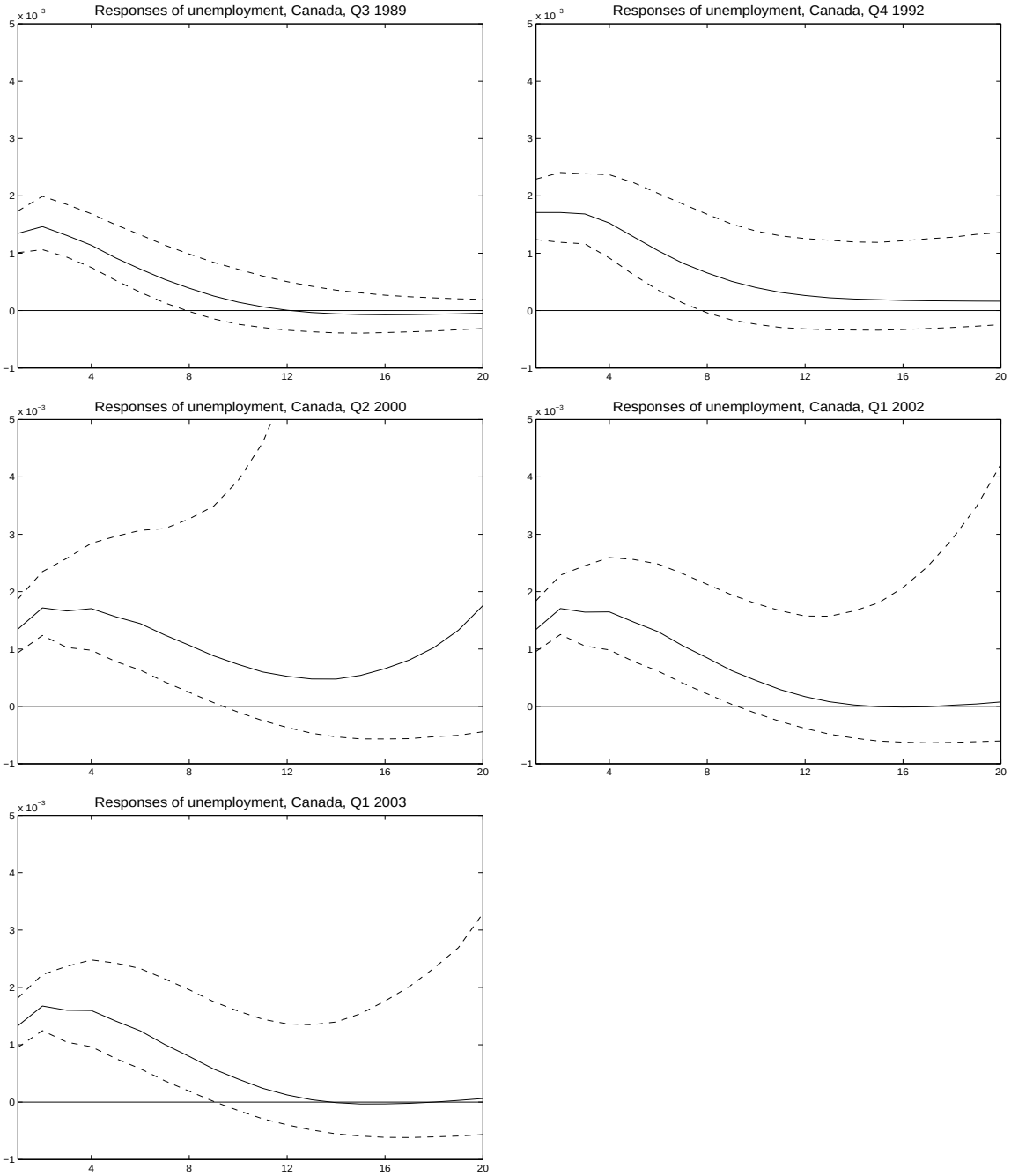


Figure E. 11. Impulse responses of unemployment rates -*Homo TVP-VAR*, Canada

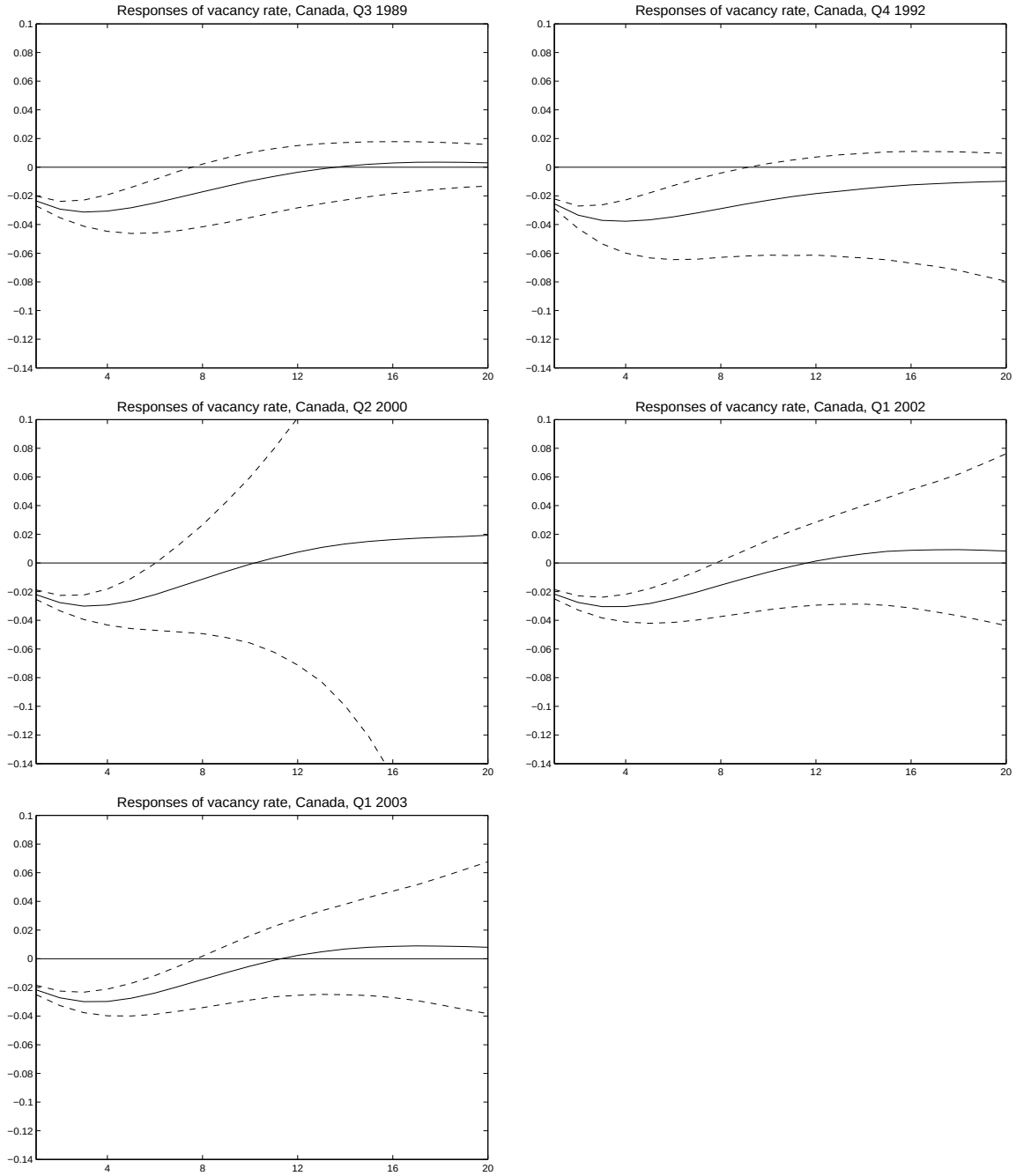


Figure E. 12. Impulse responses of vacancies -*Homo TVP-VAR*, Canada

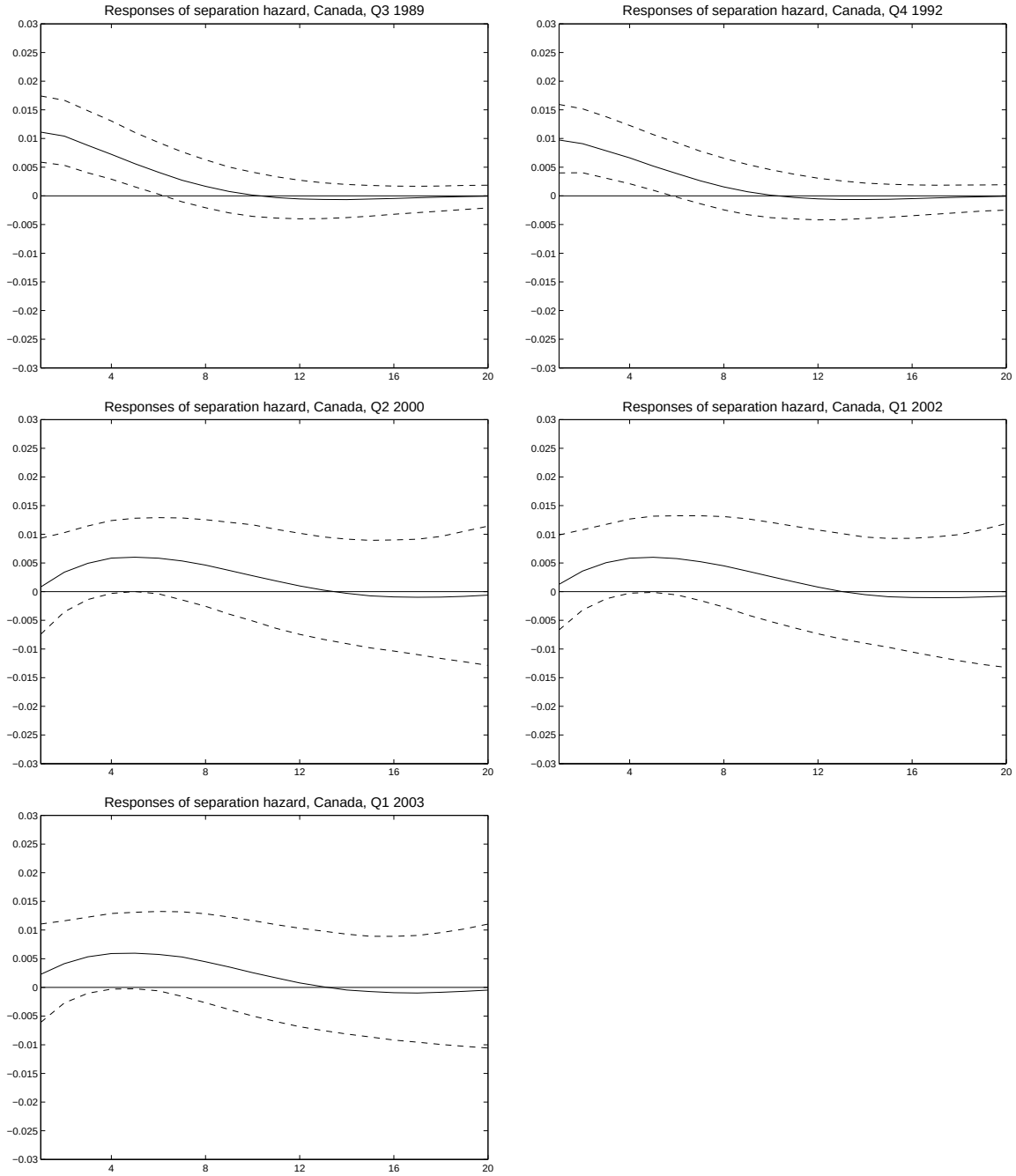
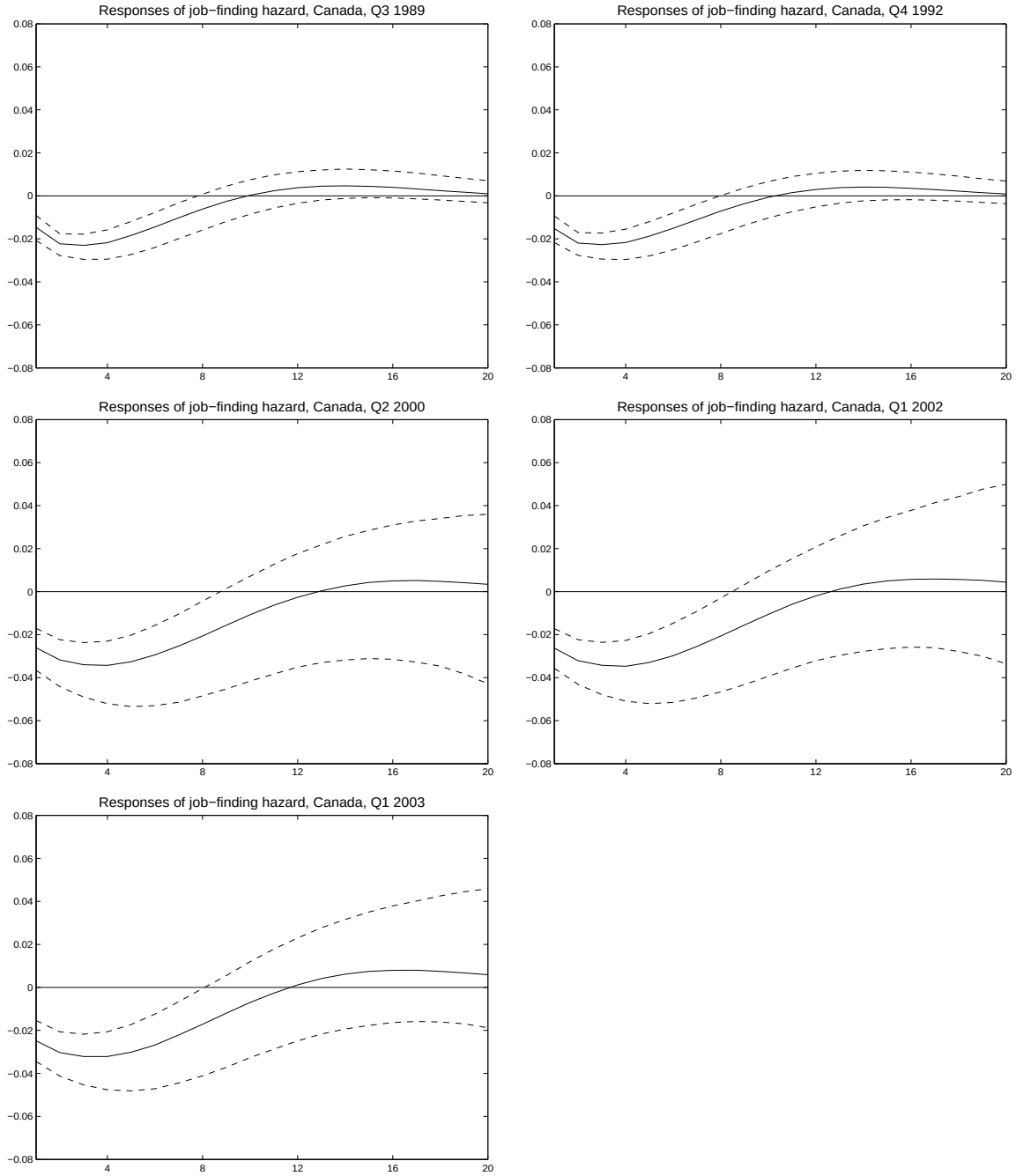


Figure E. 13. Impulse responses of separation hazards -*Hete TVP-VAR*, Canada



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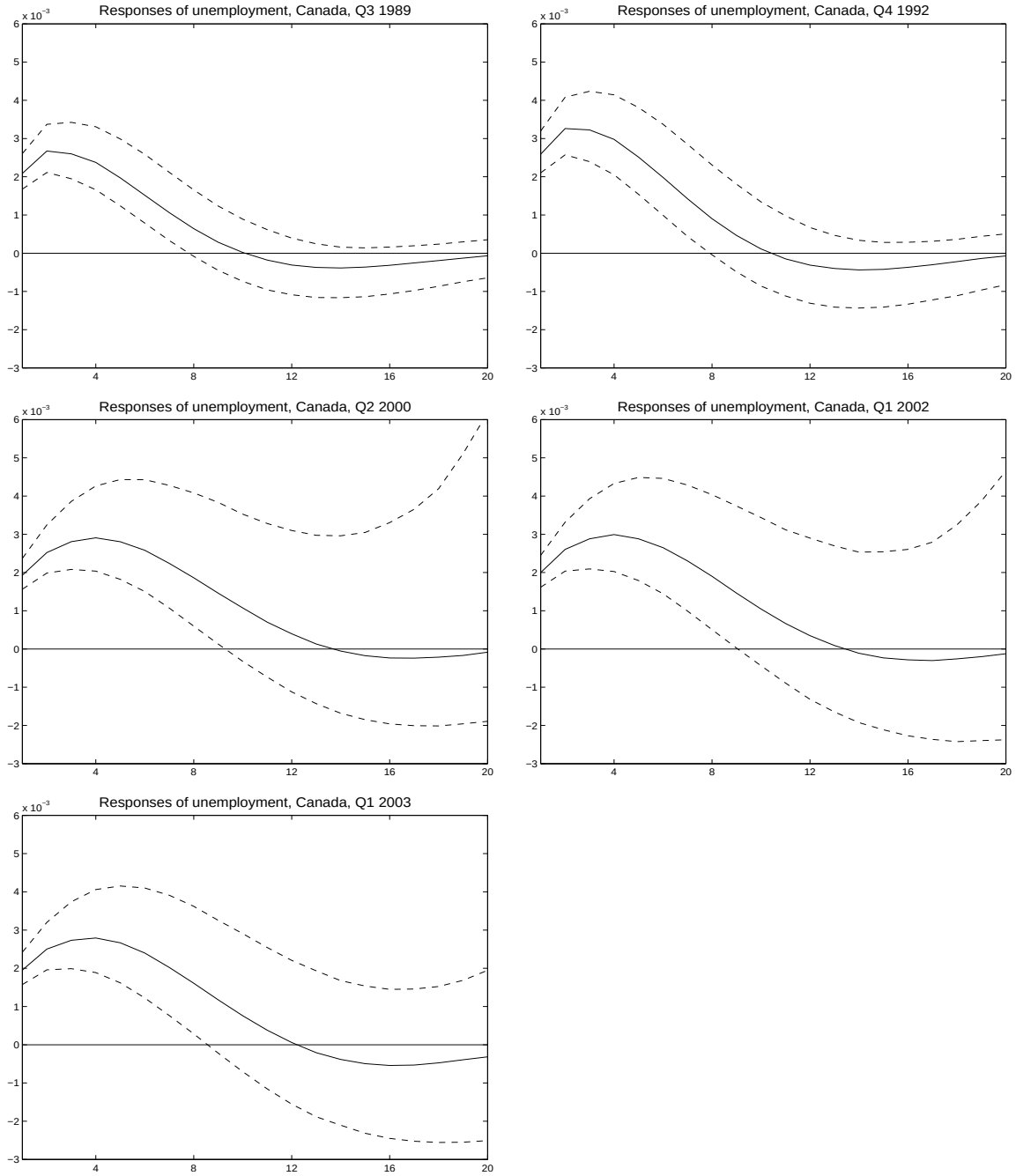


Figure E. 15. Impulse responses of unemployment rates -*Hete TVP-VAR*, Canada

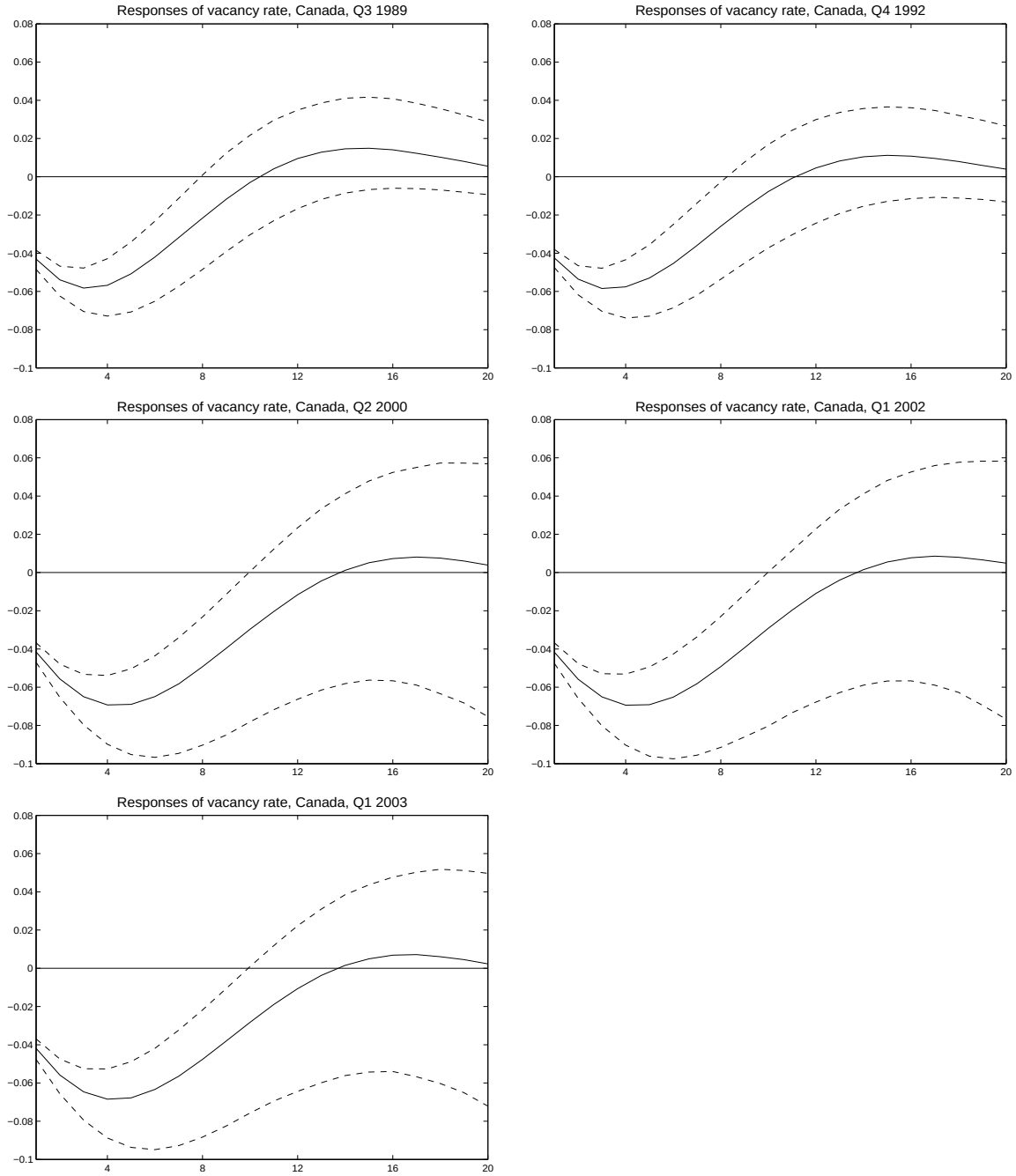


Figure E. 16. Impulse responses of vacancies -*Hete TVP-VAR*, Canada

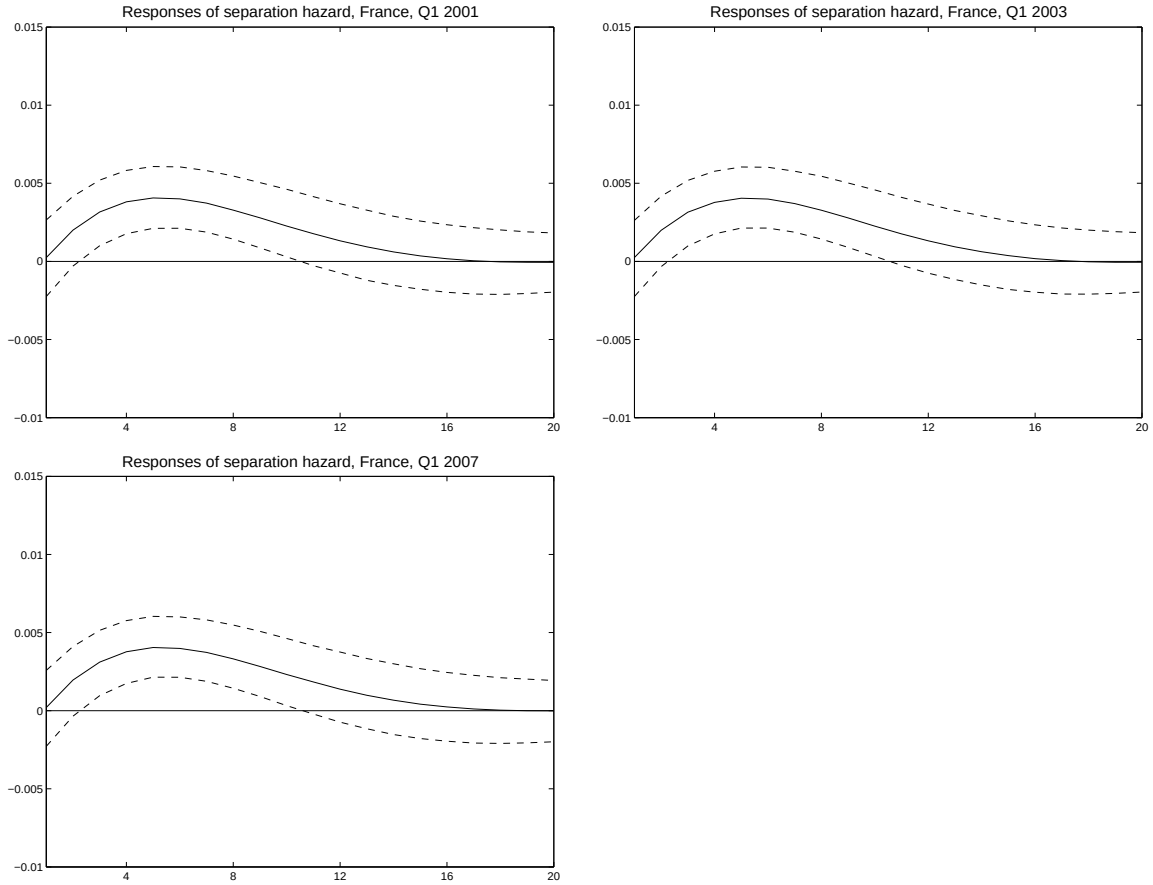


Figure E. 17. Impulse responses of separation hazards -*Homo TVP-VAR*, France

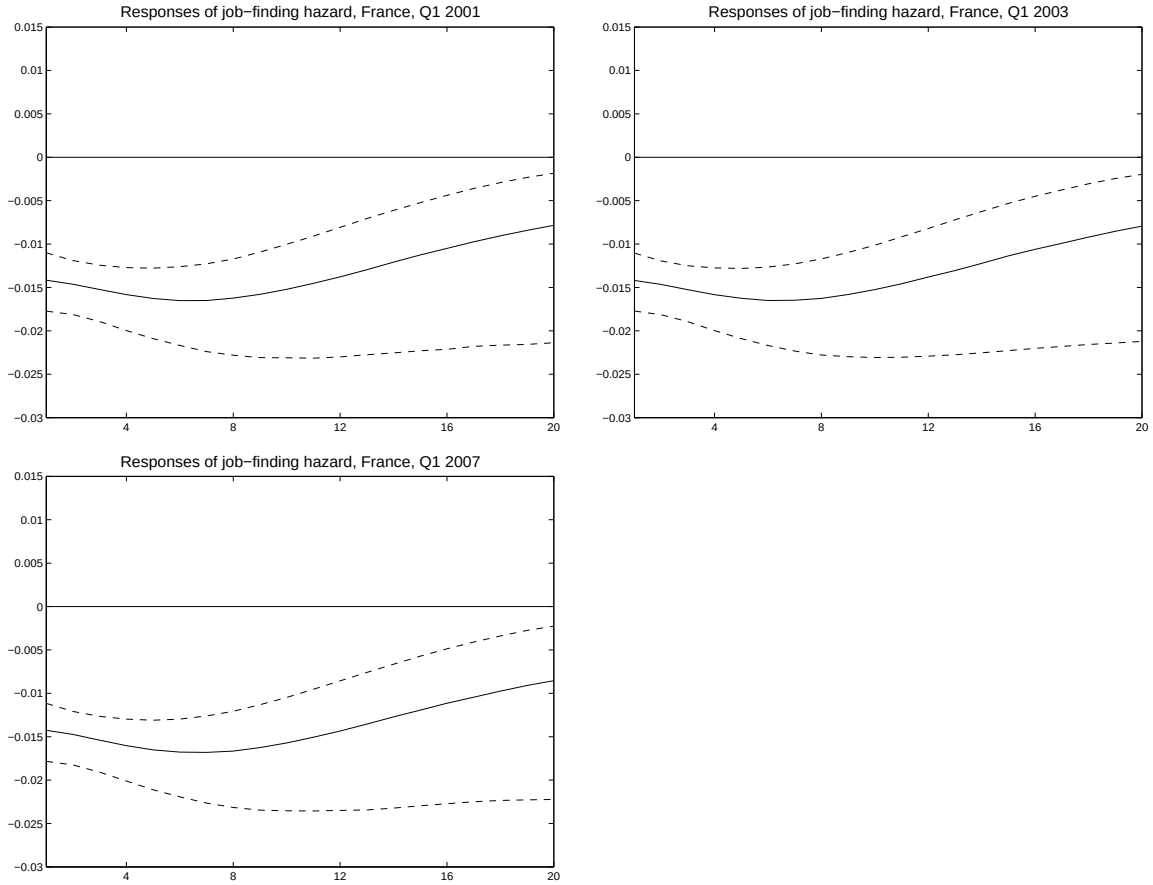


Figure E. 18. Impulse responses of job-finding hazards -*Homo TVP-VAR*, France

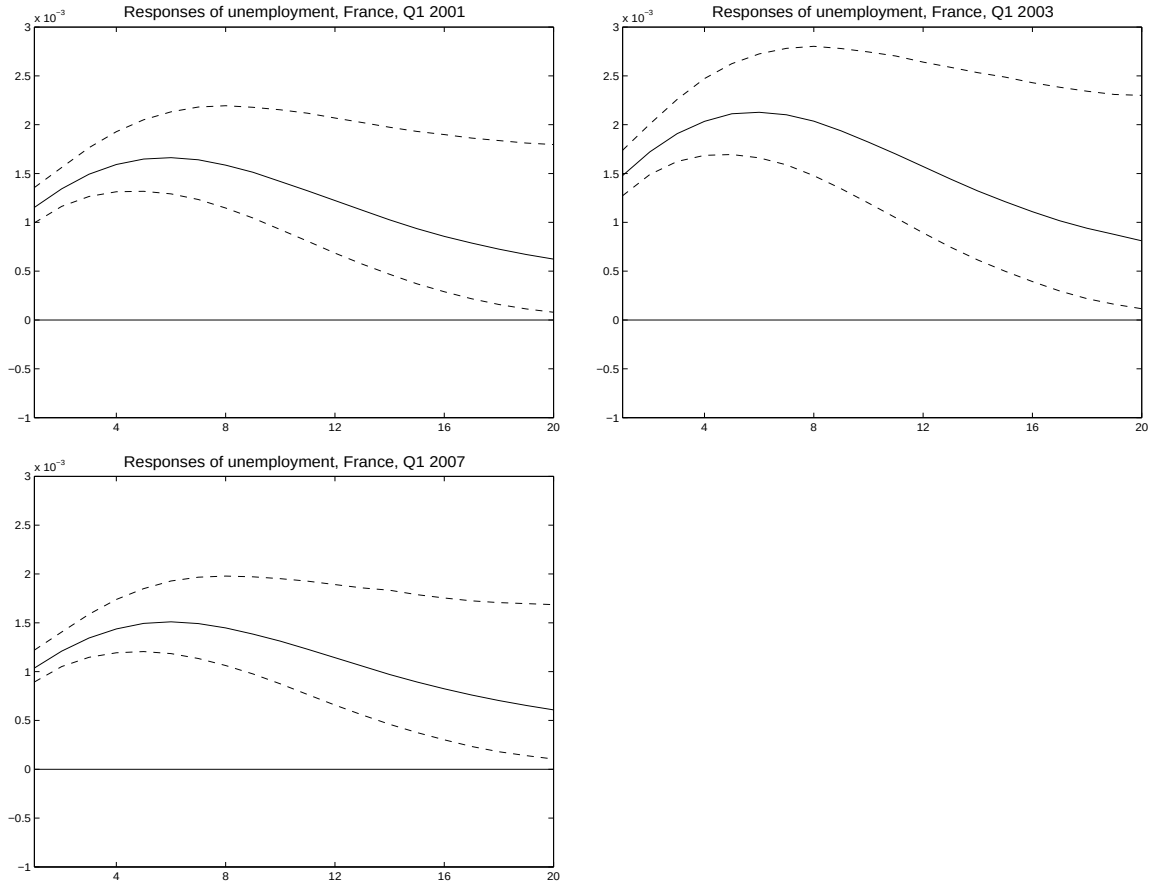


Figure E. 19. Impulse responses of unemployment rates -*Homo TVP-VAR*, France

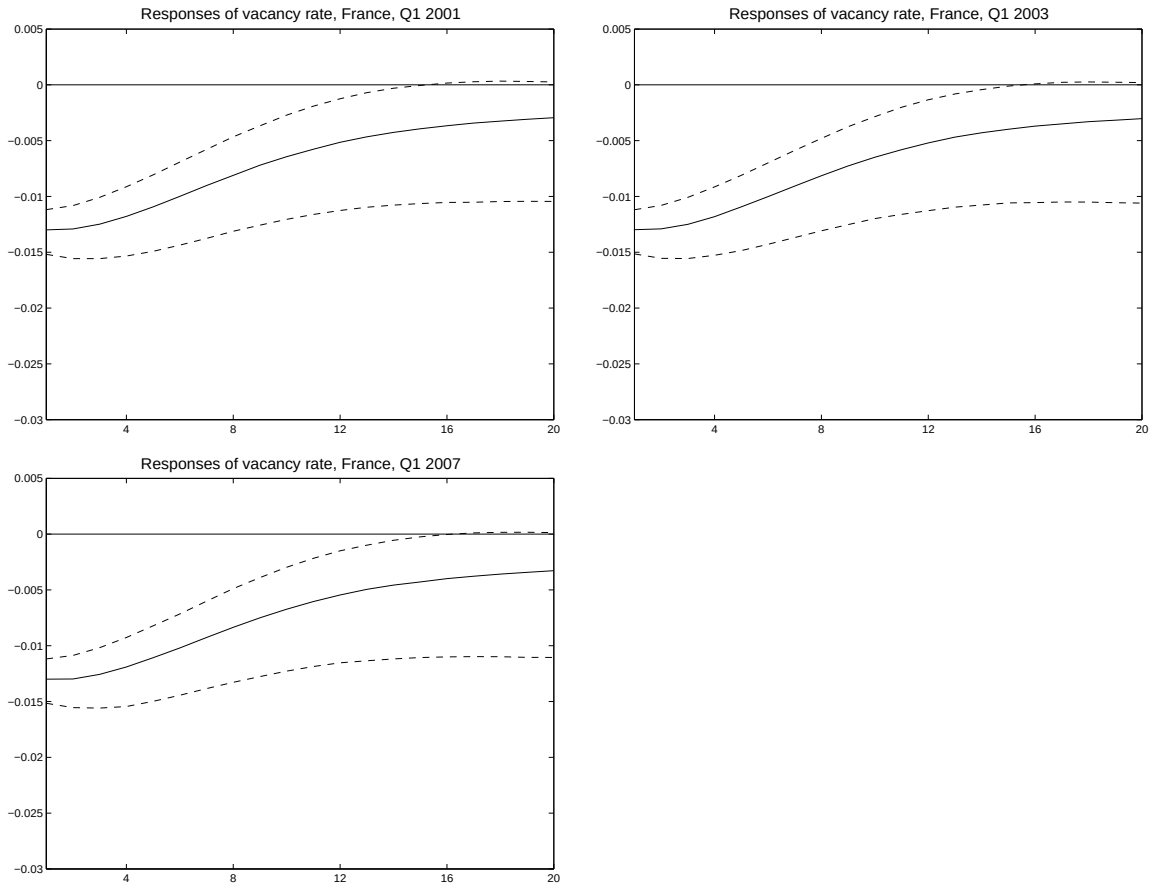


Figure E. 20. Impulse responses of vacancies -*Homo TVP-VAR*, France

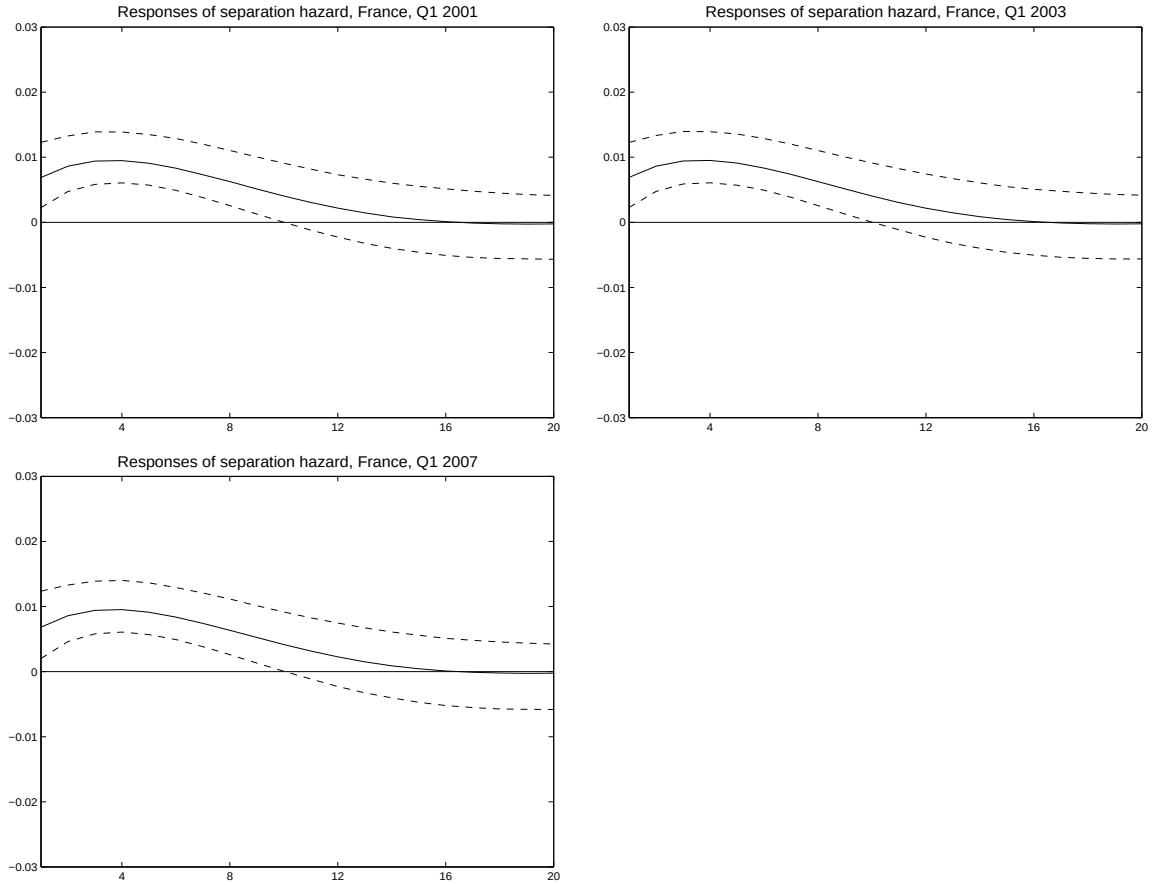


Figure E. 21. Impulse responses of separation hazards -*Hete TVP-VAR*, France

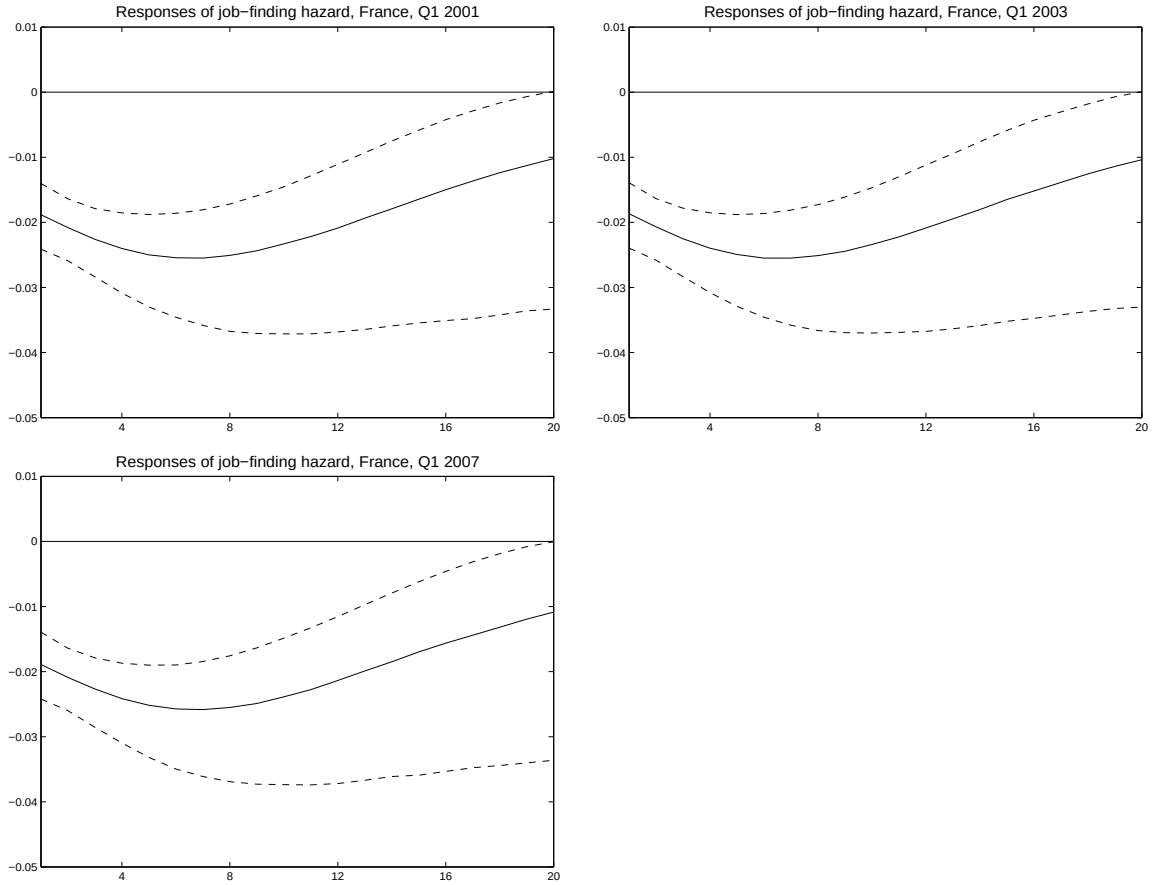


Figure E. 22. Impulse responses of job-finding hazards -*Hete TVP-VAR*, France

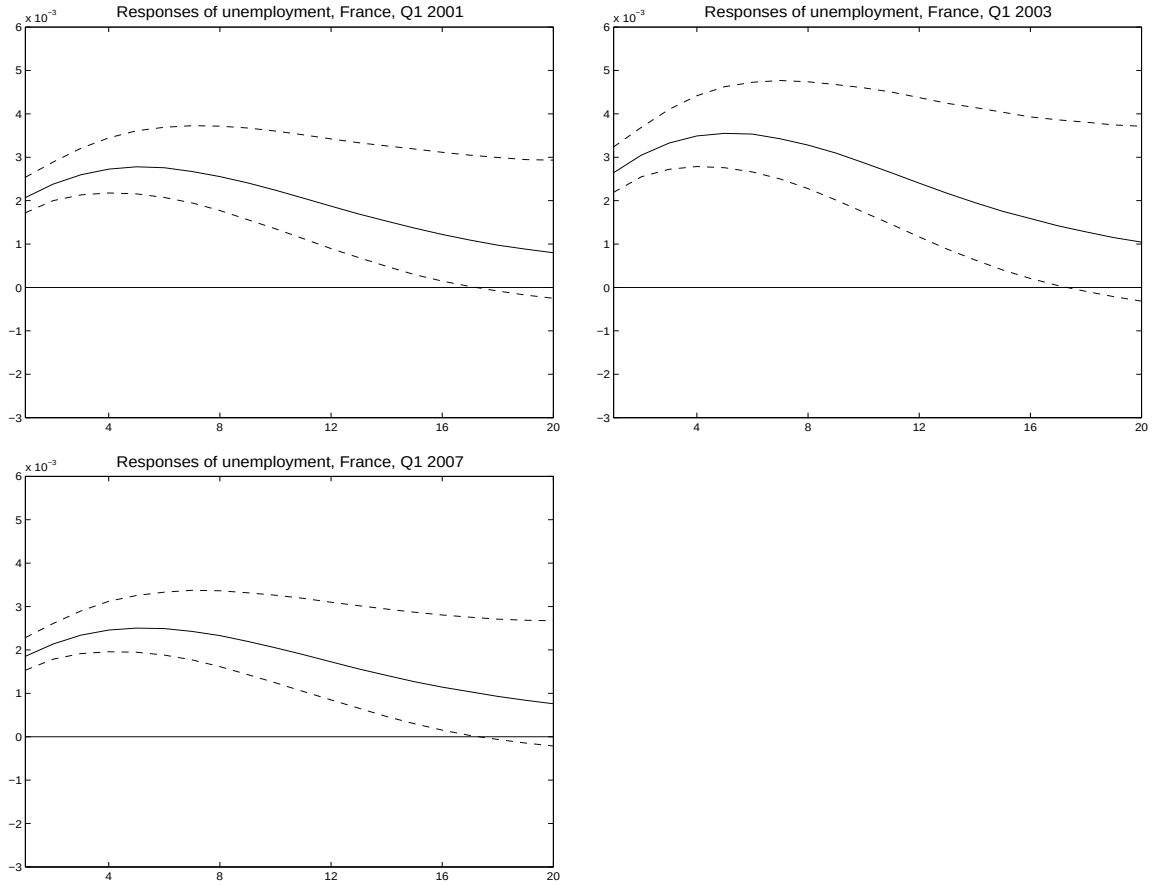


Figure E. 23. Impulse responses of unemployment rates -*Hete TVP-VAR*, France

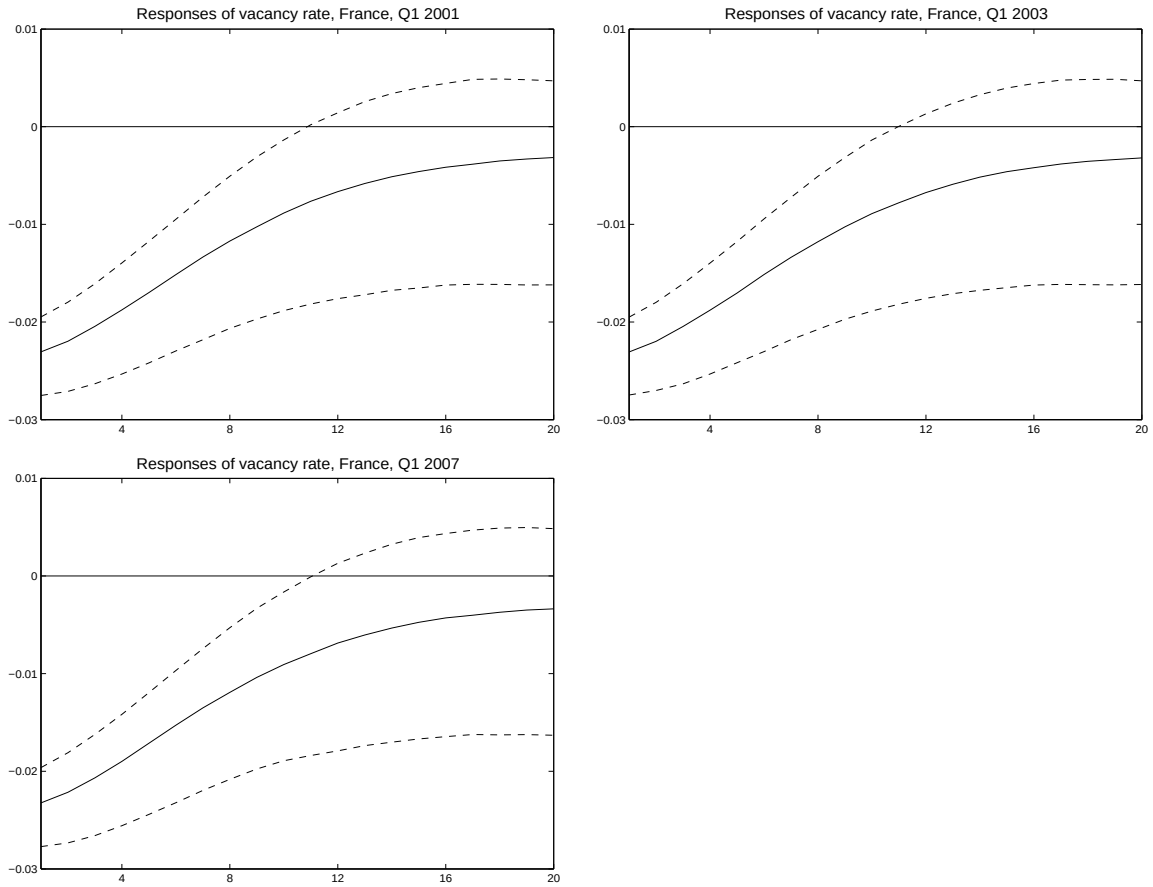


Figure E. 24. Impulse responses of vacancies -*Hete TVP-VAR*, France

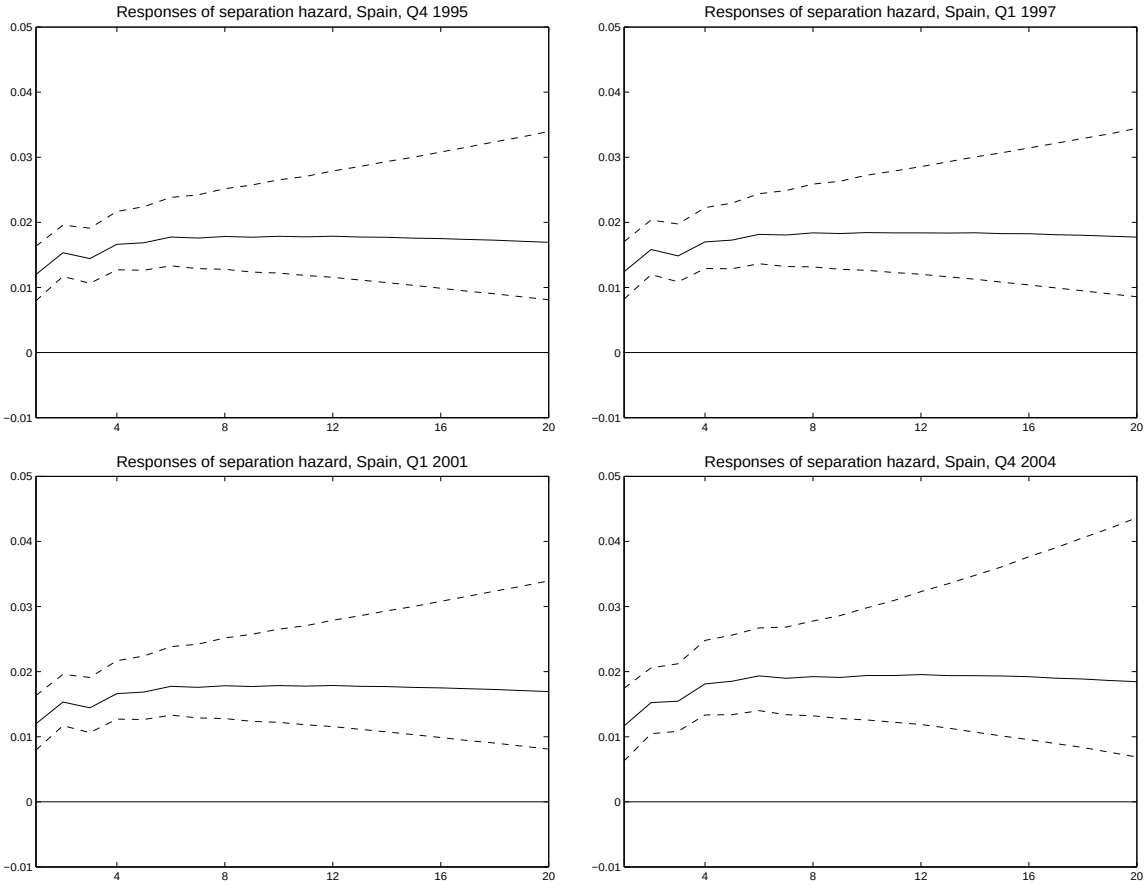


Figure E. 25. Impulse responses of separation hazards -*Homo TVP-VAR*, Spain

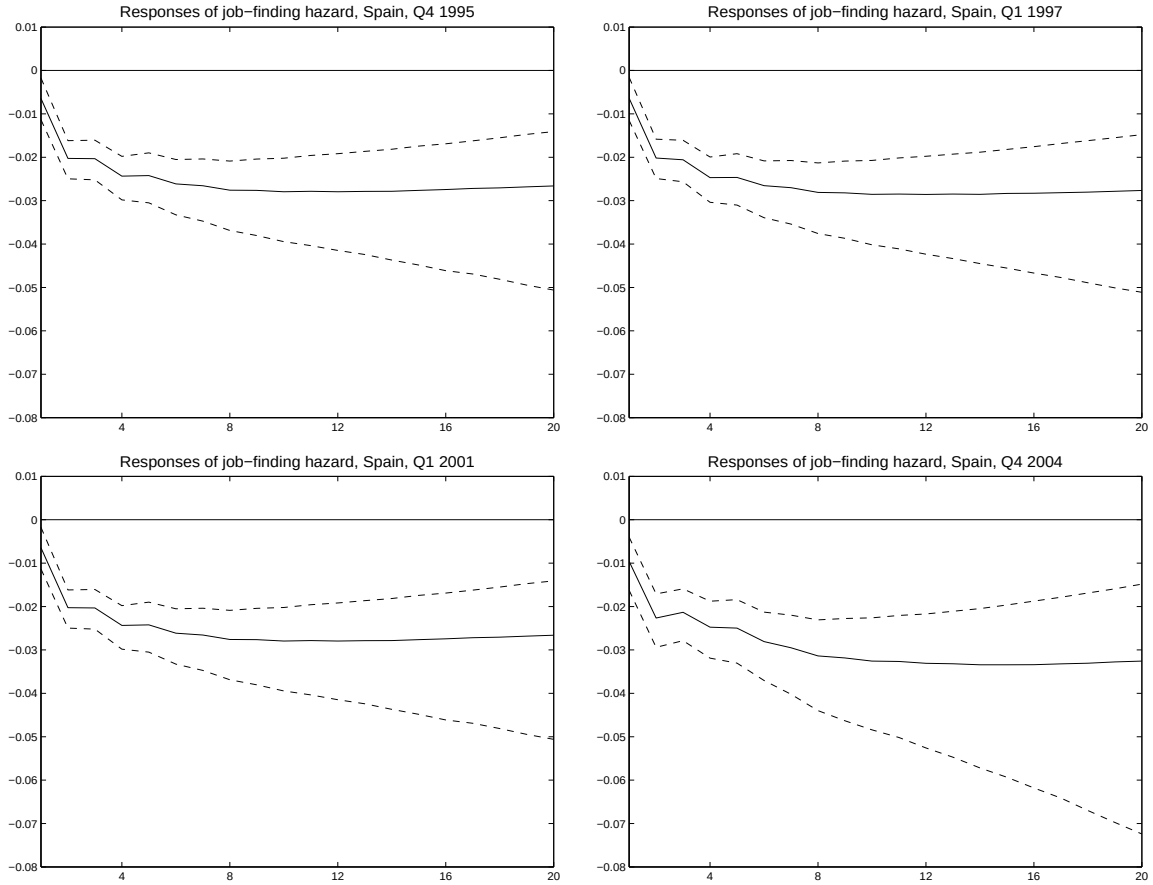


Figure E. 26. Impulse responses of job-finding hazards -*Homo TVP-VAR*, Spain

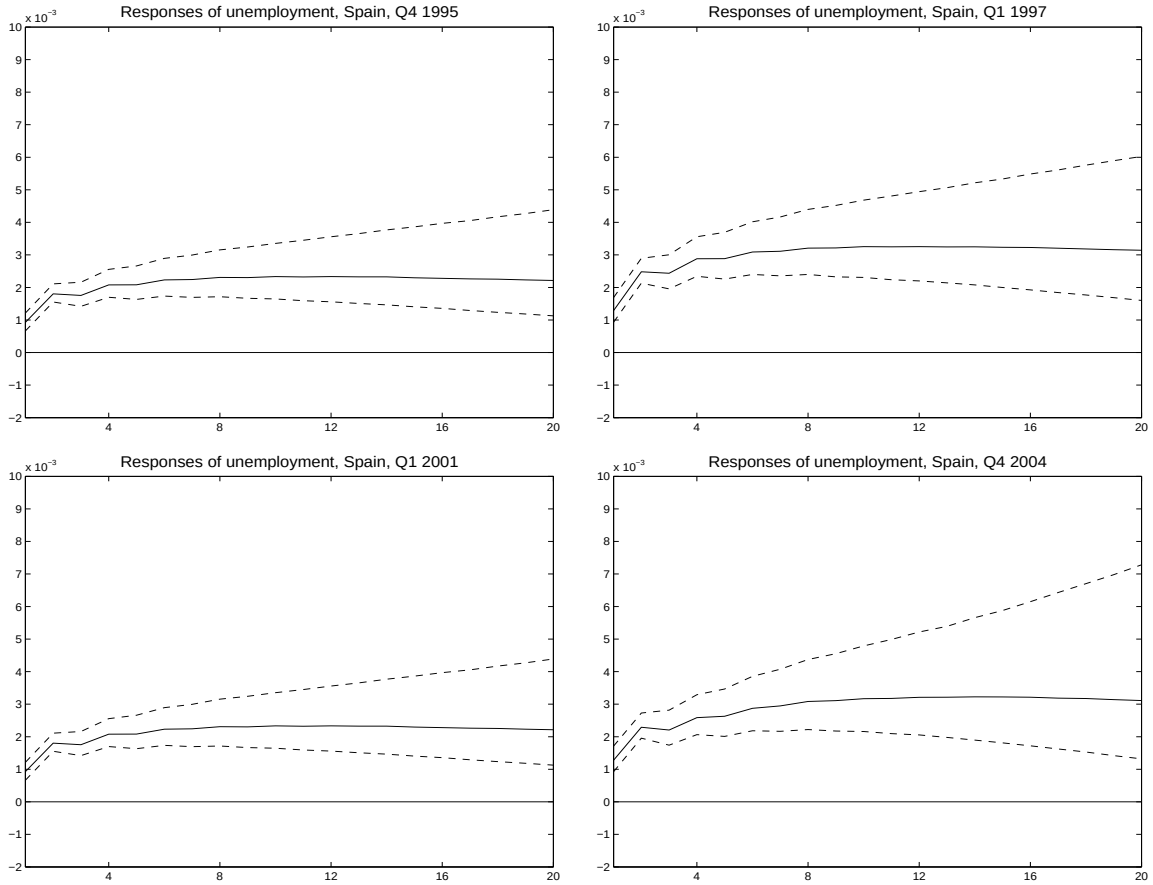


Figure E. 27. Impulse responses of unemployment rates -*Homo TVP-VAR*, Spain

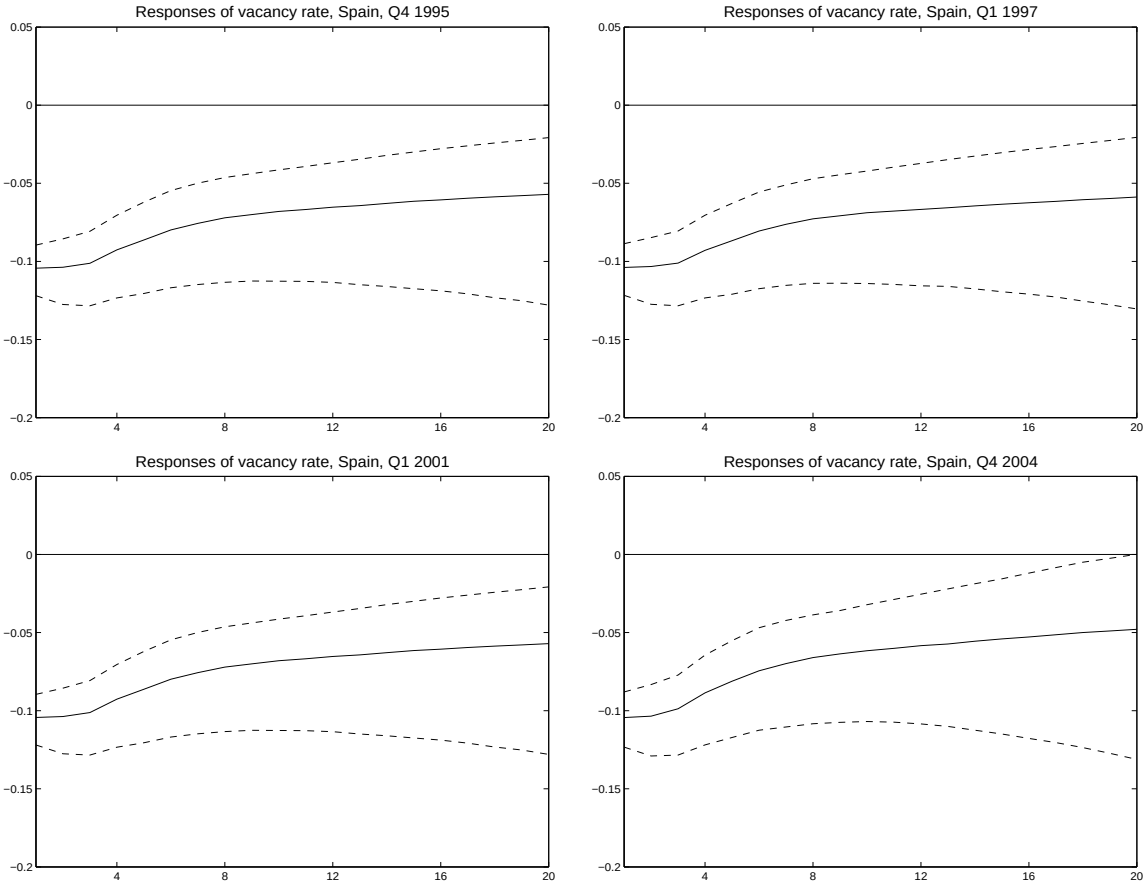
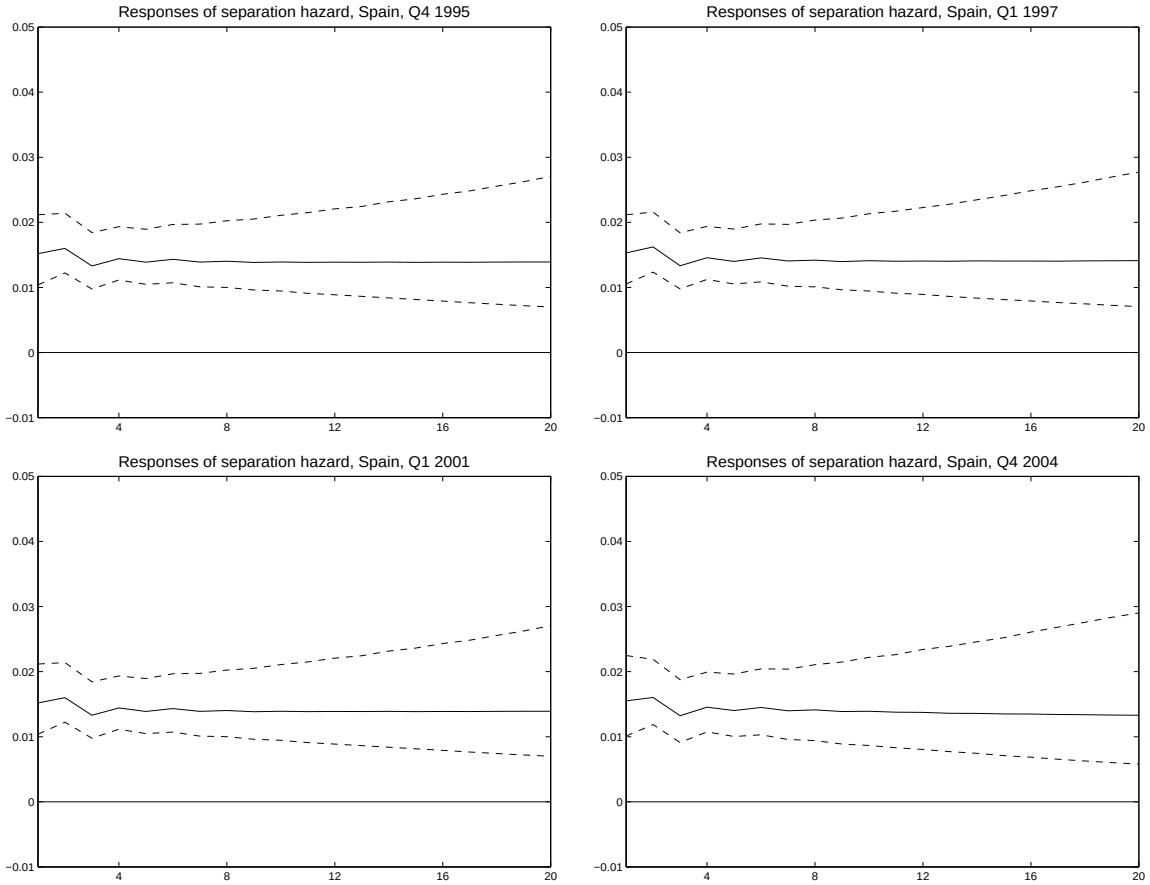


Figure E. 28. Impulse responses of vacancies -*Homo TVP-VAR*, Spain



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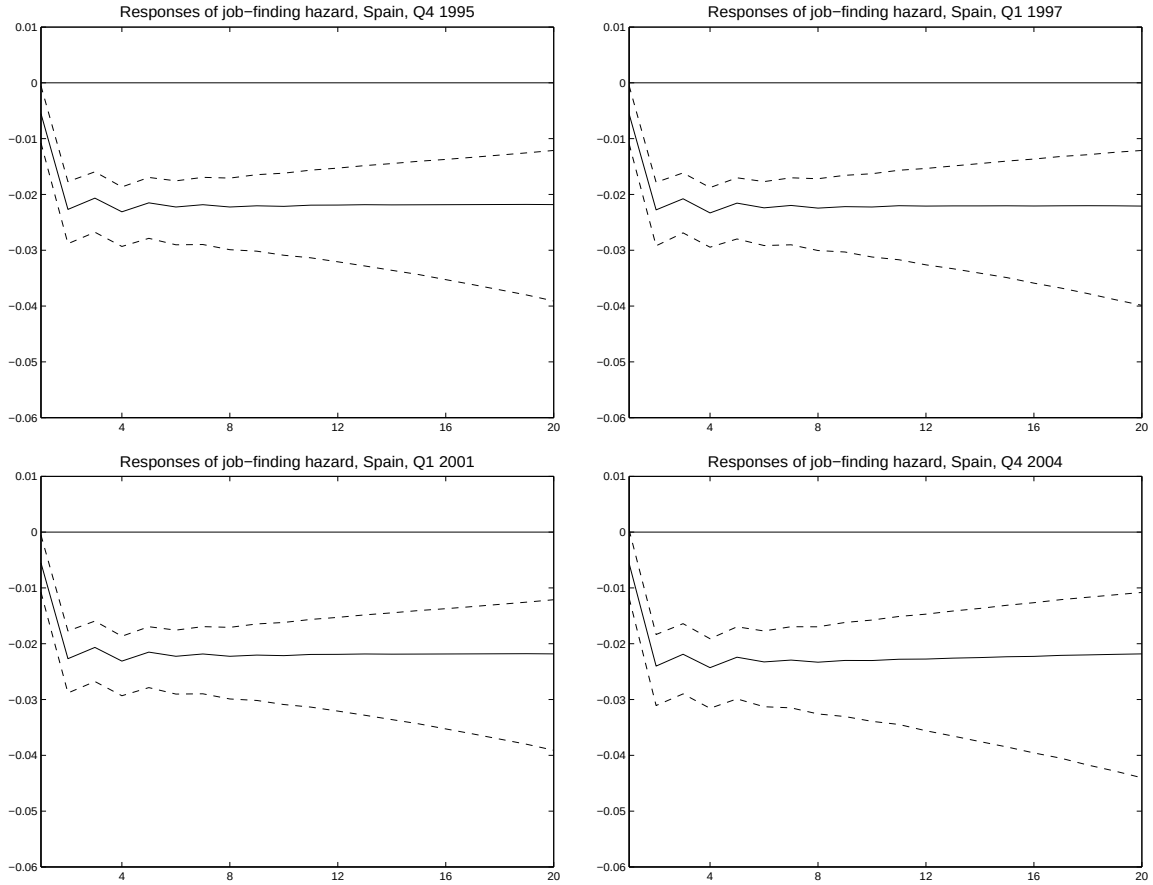


Figure E. 30. Impulse responses of job-finding hazards -*Hete TVP-VAR*, Spain

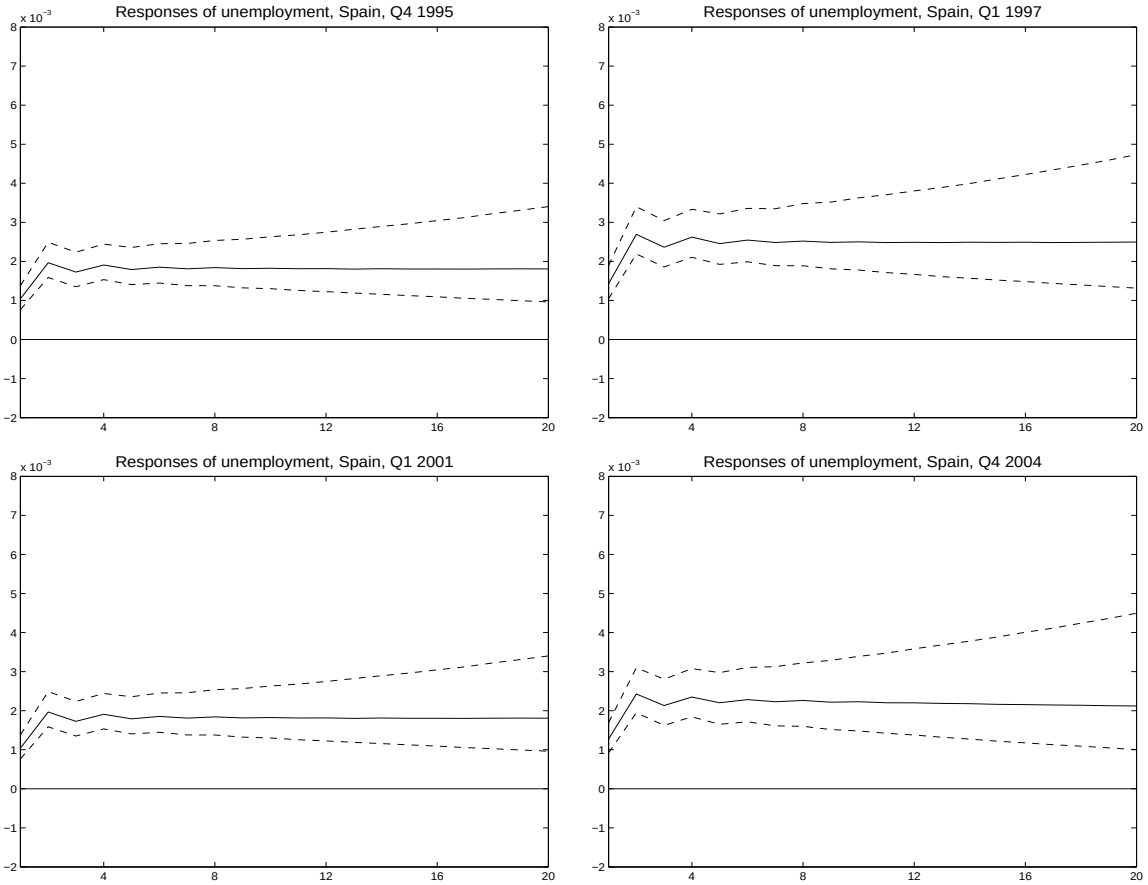


Figure E. 31. Impulse responses of unemployment rates -*Hete TVP-VAR*, Spain

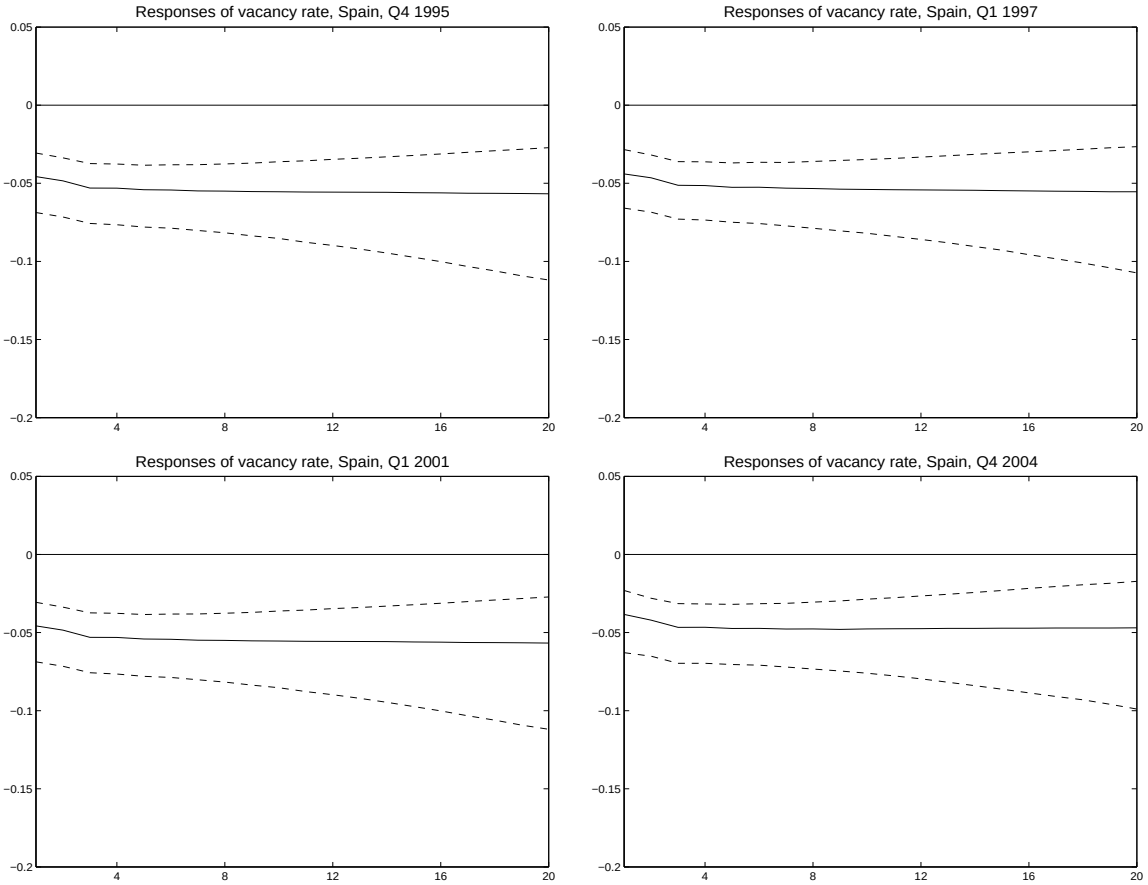


Figure E. 32. Impulse responses of vacancies -*Hete TVP-VAR*, Spain

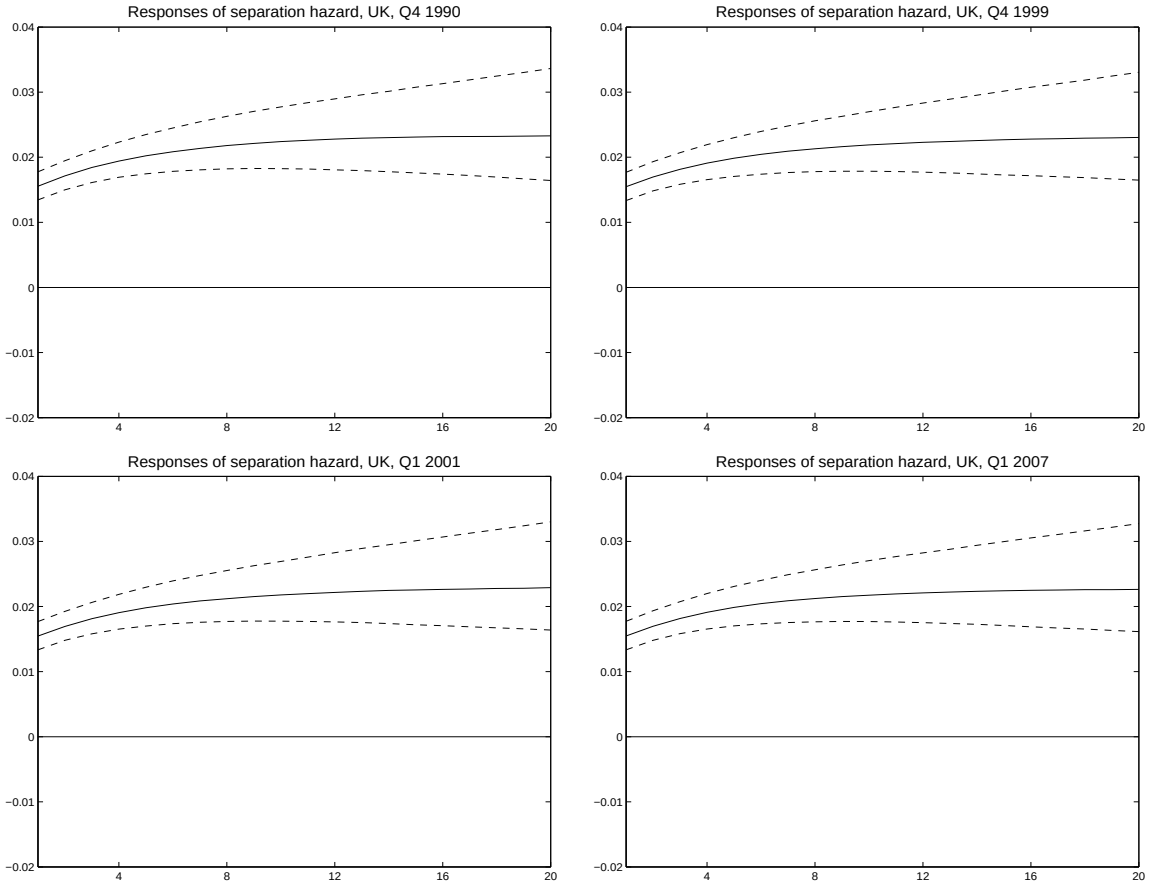
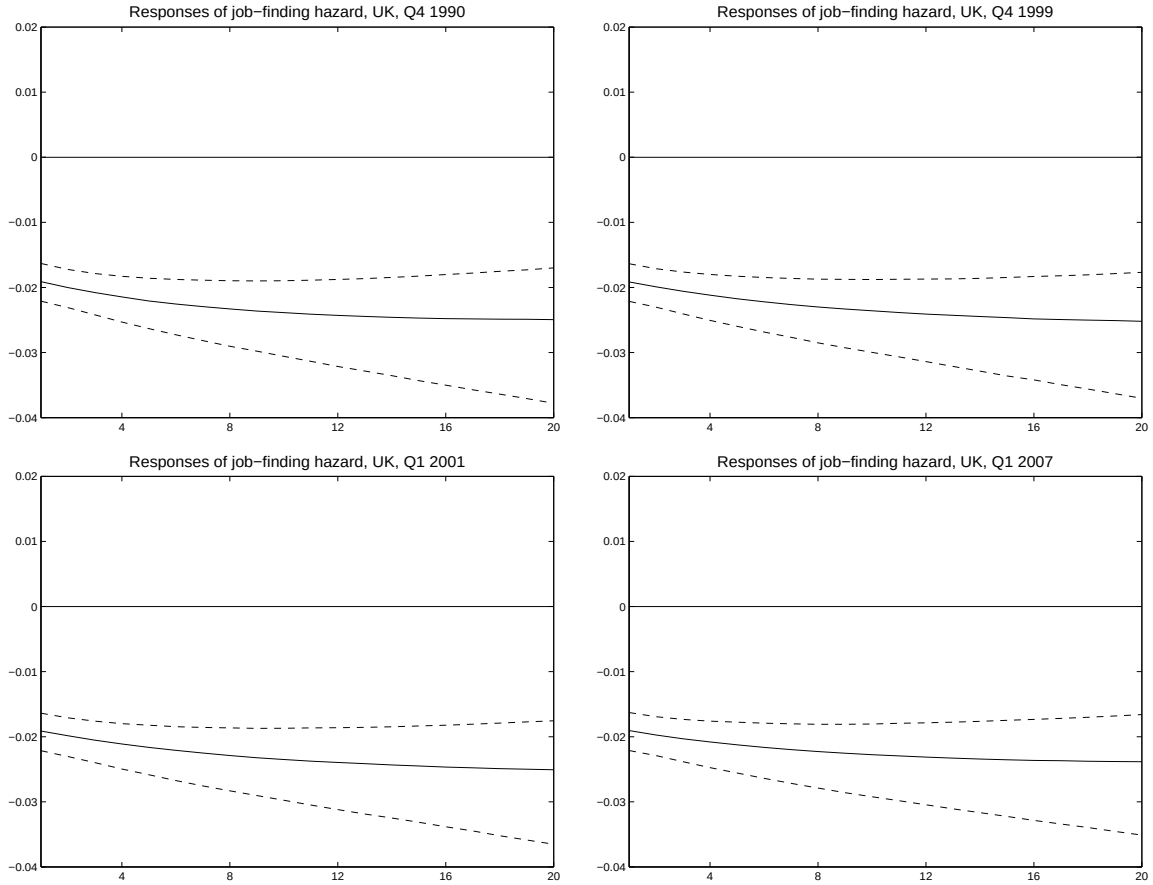


Figure E. 33. Impulse responses of separation hazards -*Homo TVP-VAR*, UK



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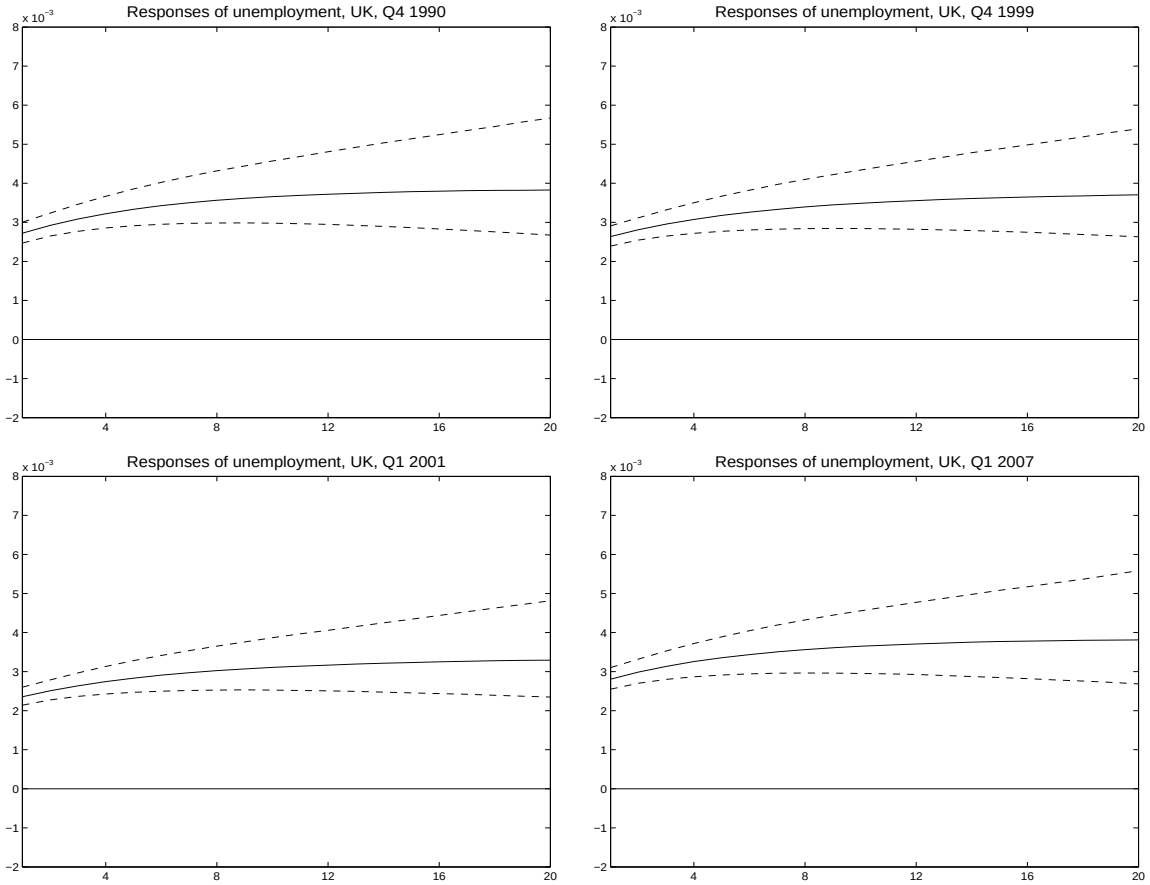
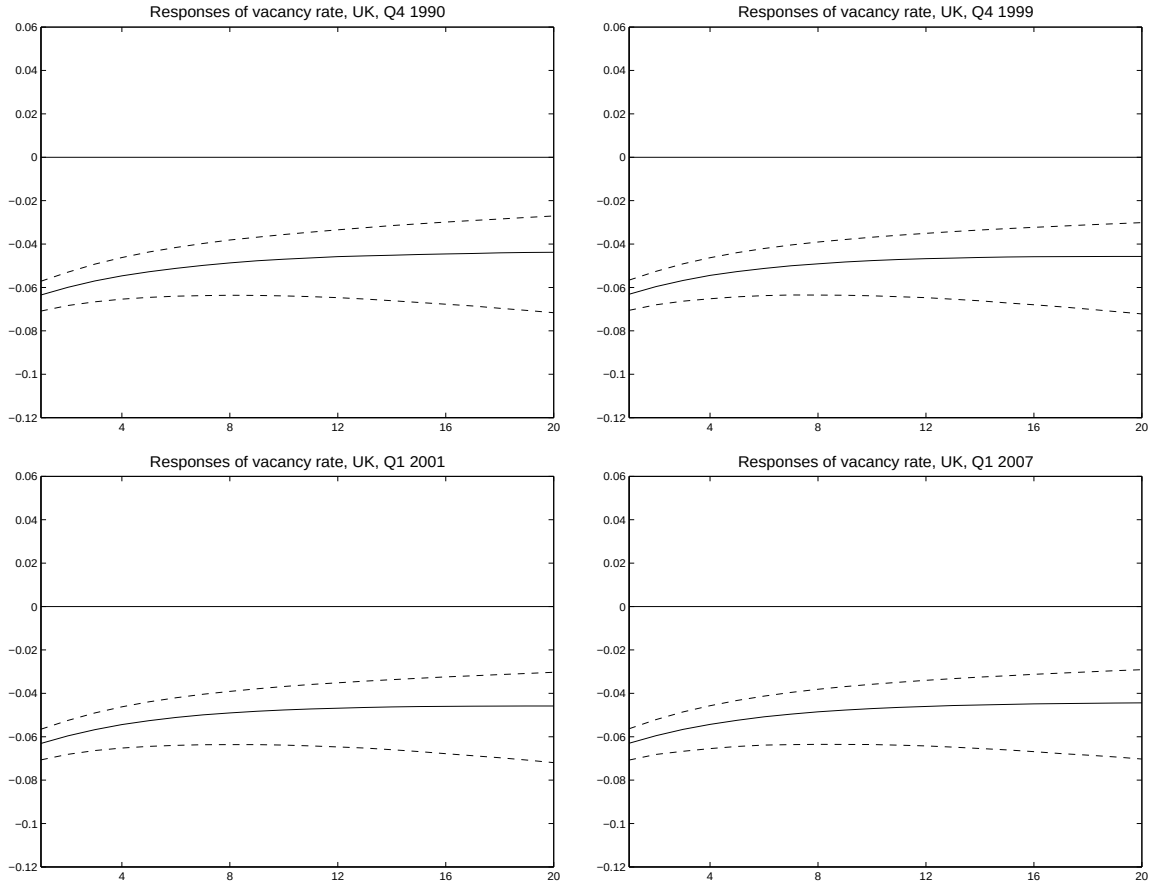


Figure E. 35. Impulse responses of unemployment rates -*Homo TVP-VAR*, UK



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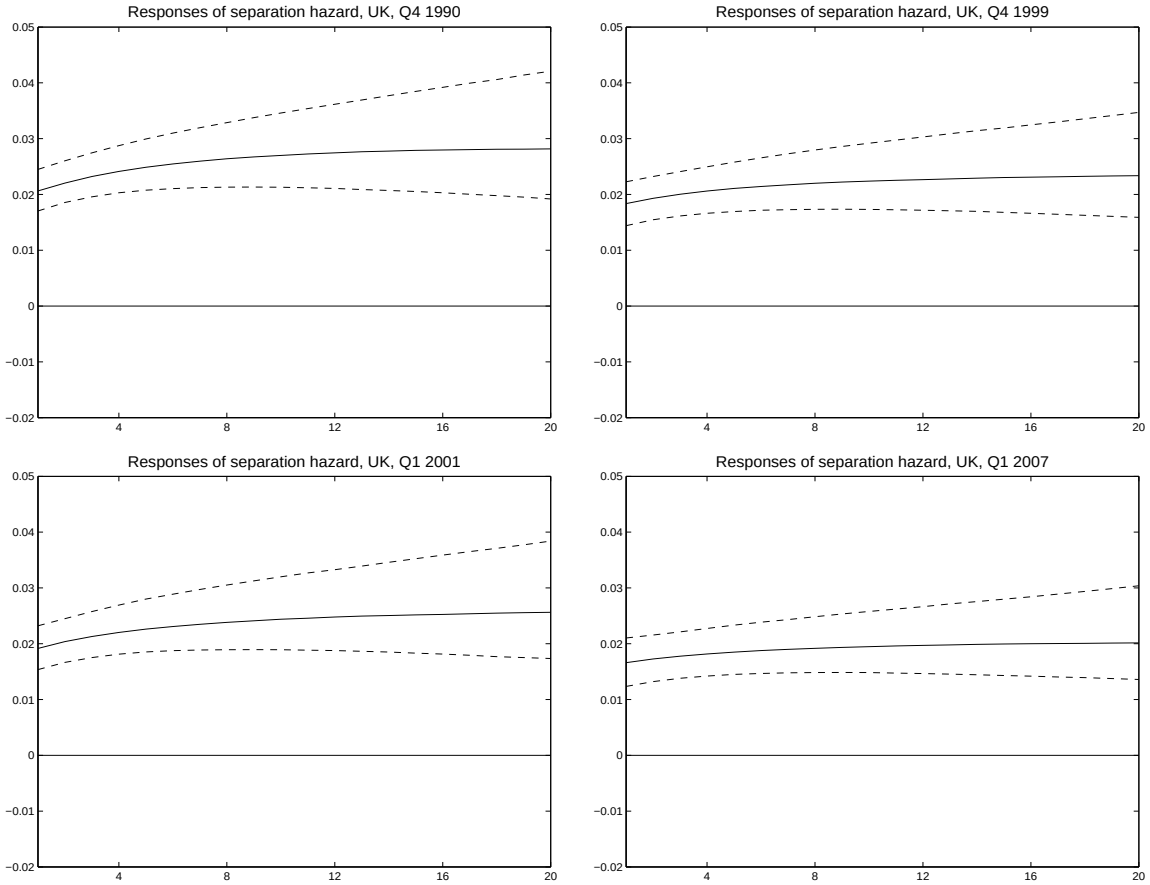
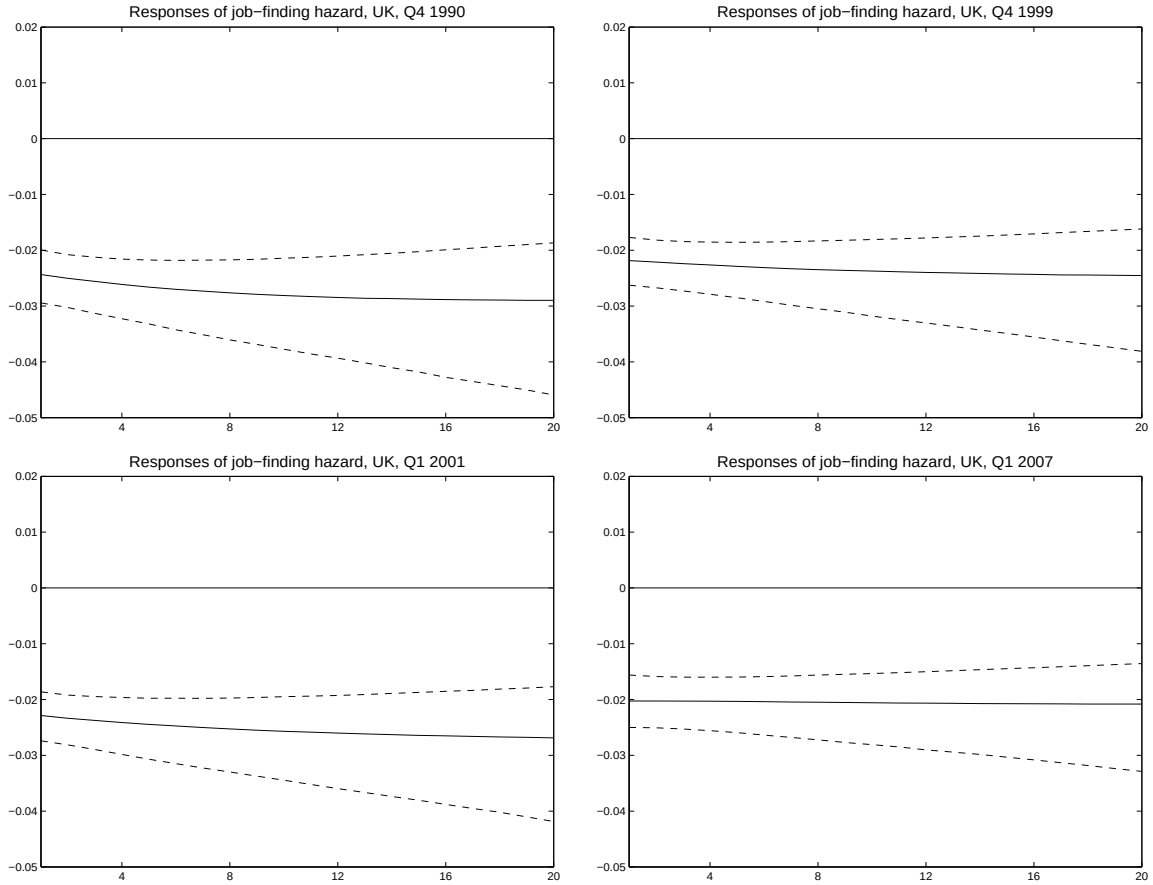


Figure E. 37. Impulse responses of separation hazards -*Hete TVP-VAR*, UK



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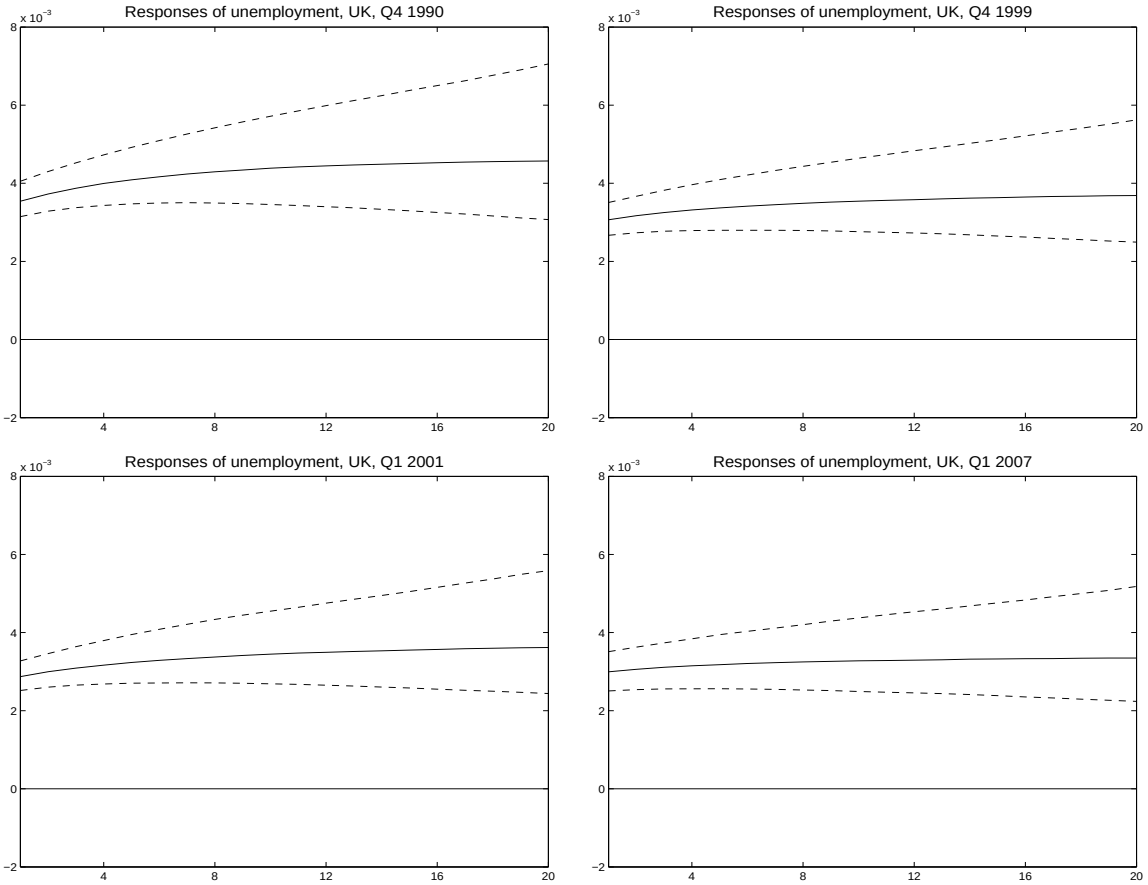

Figure E. 39. Impulse responses of unemployment rates -*Hete TVP-VAR*, UK

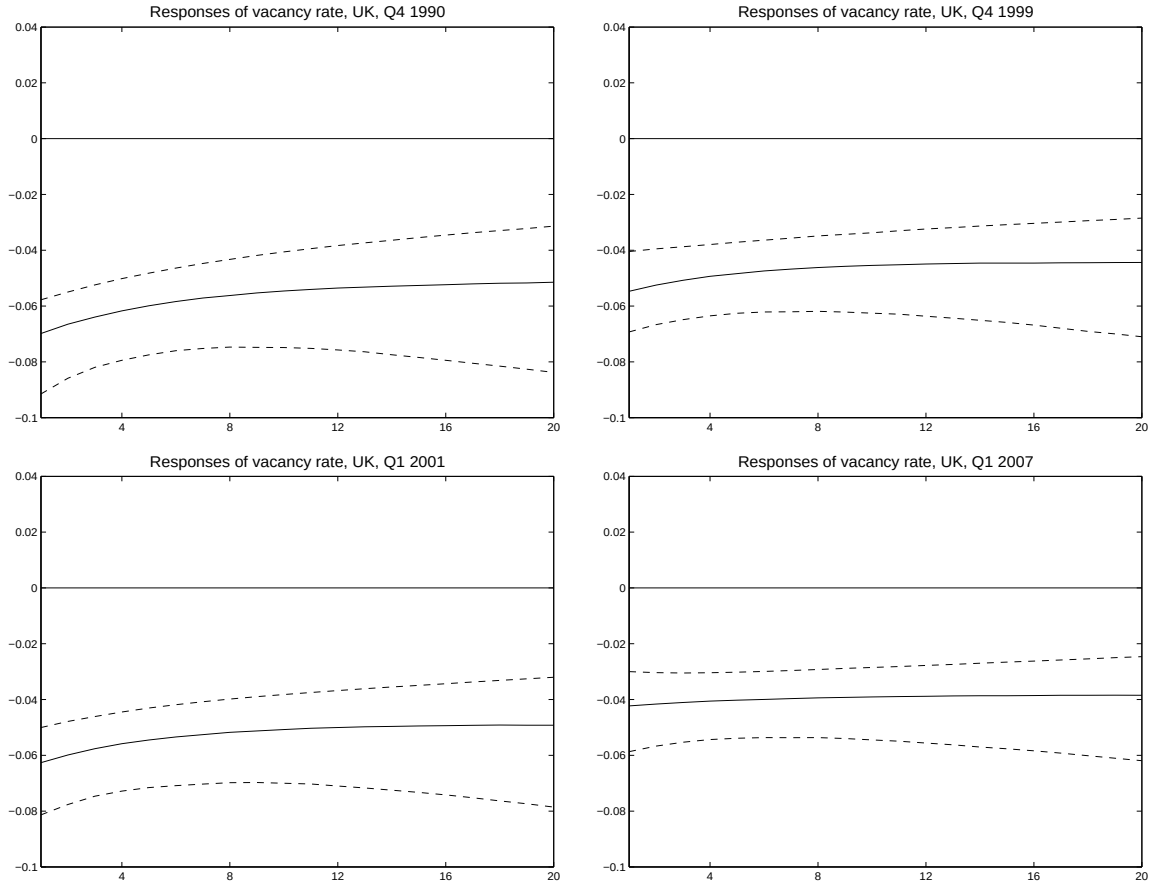

Figure E. 40. Impulse responses of vacancies -*Hete TVP-VAR*, UK