

Internet Appendix for “The Great Divorce Between Investment and Profitability”

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IA.1. Additional Empirical Evidence

Figure IA.1: Relation Between Investment and Profitability Factors–FF Sample

This figure reports moving averages of monthly percentage returns for the profitability (RMW) and investment (CMA) factors from July 1963 through May 2019 from Fama and French (2015). Each point represents the average return for a ten-year window centered on the date indicated by the x -axis. The first point corresponds to June 1968 and represents the average return from July 1963 through June 1973. Note that the investment factor (profitability factor) is constructed by going long firms with *low* asset growth (*high* operating profitability) and shorting firms with *high* asset growth (*low* operating profitability). The red vertical line indicates July 1980. The correlation of *monthly returns* for CMA and RMW factors is -0.61 before July 1980 and 0.13 afterwards.

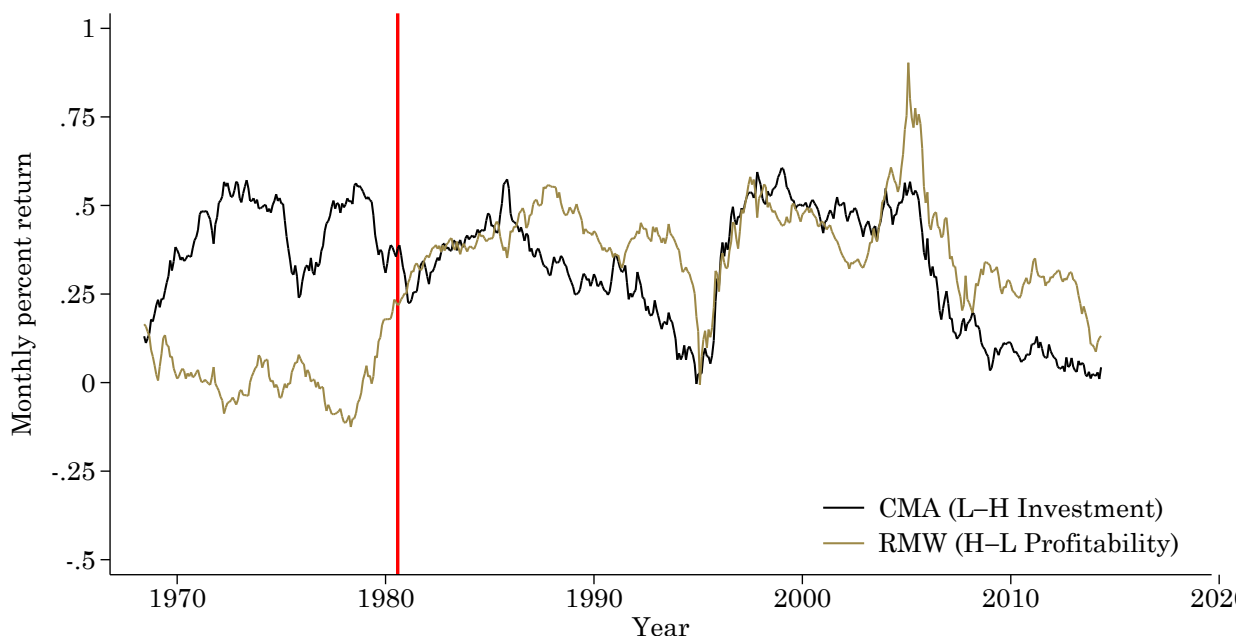


Figure IA.2: Relation Between Firm Investment and Profitability of Long-Lived Firms

This figure reports the time series of the cross-sectional correlations between investment, measured by asset growth, and profitability, measured by operating profitability for firms that survive in CRSP sample for ten or more years. See Appendix A for variable definitions. The red vertical line indicates the year 1979.

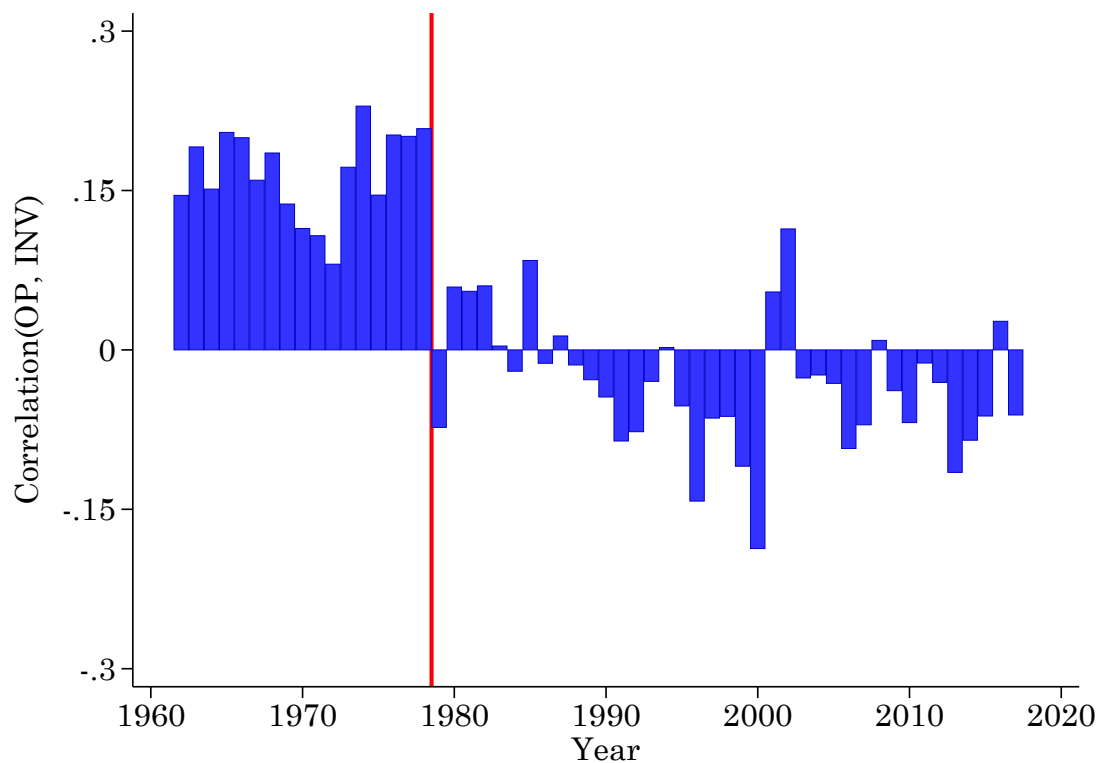
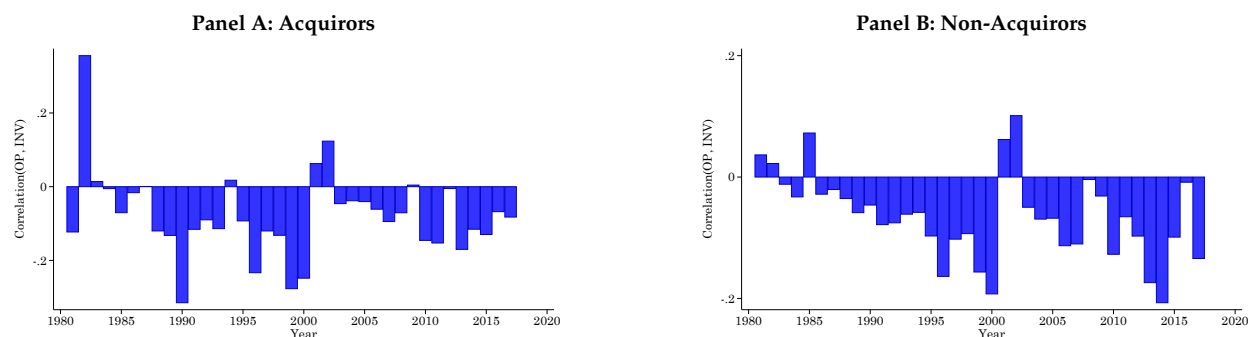


Figure IA.3: Correlation Between Firm Investment and Profitability By Acquiror Status

We identify whether a firm is an acquiror by matching the acquirors and acquirors' parent firms in the SDC Platinum database by ticker, CUSIP, or name to Compustat. We label a firm as an acquiror if it made any acquisitions within 400 days of the Compustat datadate. Acquirors account for 21% of our final sample from 1981 to 2017.



IA.2. Model Robustness

In the model, Case 1, representing the early period, and case 2, representing the later period are distinguished by two features. Case 1 has higher discount rates for long-term projects compared to short-term projects, while case 2 has higher discount rates for short-term projects compared to long-term projects. Additionally, case 2 has more young firms as it has a higher firm entry rate and a lower number of burn-in periods for new firms. Finally, both cases have firm-level variation in discount rates. In this section, we demonstrate that the short- versus long-term discount rate channel is the key driver for generating our qualitative results, not the different firm entry rates across cases or firm-level discount rate variation.

We perform a falsification test where the short- and long-term discount rates in case 2 are the same as in case 1 ($R_s = 1.125$ and $R_l = 1.15$), but the entry rate and burn-in in case 2 are still different. If the discount rate channel drives the differences between case 1 and case 2 and not the differences in firm entry parameters, then shutting down the discount

rate should generate similar results in both cases. Figures [IA.4](#), [IA.5](#), [IA.6](#), [IA.7](#), and [IA.8](#) show that both cases have nearly identical model simulation results when they have the same discount rates. Therefore, only varying firm entry parameters without decreasing relative discount rates for long-term projects is not sufficient for generating the results we see in the baseline model simulation.

Next, we simulate the model without firm-level discount rate variation ($\epsilon_j^R = 0$). In our model, the purpose of the firm-level discount rate variation is to introduce a source of discount rate variation that is unrelated to the difference between short- and long-term discount rates. This should increase the cross-sectional variance of investment, create an investment return spread in case 1, and steepen the investment return spread in case 2. Therefore, shutting down firm-level discount rate variation should not affect the qualitative results of the model, although it may alter its quantitative fit. The simulation results with no firm-level discount variation in Figures [IA.9](#), [IA.10](#), [IA.11](#), [IA.12](#), and [IA.13](#) show that this is the case. Figure [IA.9](#) shows that the proportion of high duration firms is still much higher in case 2 compared to case 1. Figure [IA.10](#) shows that new firms are still less profitable in case 2. Figure [IA.11](#) shows that firm investment and profitability are still highly positively correlated in case 1, and they are still negatively correlated in case 2, although the cross-sectional variance of investment is muted. Figure [IA.12](#) shows that the profitability return spread is flat in case 1 and positive in case 2, as in the baseline model. Finally, Figure [IA.13](#) shows that the investment return spread is flat in case 1, as expected, but it is still negative in case 2.

We show that the different firm entry parameters in case 2 do not drive the results by setting the firm entry parameters to be the same as in case 1 (0.03 entry rate and 4 burn-in periods for new firms). The simulated results with the same entry parameters are in Figures [IA.14](#), [IA.15](#), [IA.16](#), [IA.18](#), [IA.17](#), and [IA.18](#). We see that the results with the same

entry parameters are very similar to the baseline model. The primary impact of differing entry parameters is making the firm investment-profitability relationship in case 2 more monotonically decreasing.

Finally, motivated by the evidence in Figure 6 showing that the between firm correlation is key for the negative relationship between investment and profitability, we re-simulate the model with no entry or exit. Shutting down entry and exit will ensure that all simulation results are due to within firm dynamics. In order to match the data, we should observe a positive correlation between investment and profitability in both cases, even though long-term discount rates fall in case 2. The simulated results with no exit and entry are in Figures IA.19, IA.20, IA.22, IA.21, and IA.22. Figure IA.20 confirms that, without entry and exit, the cross-sectional correlation between investment and profitability is positive in both cases.

Figure IA.4: Same Short- and Long-Term Discount Rates: Share of High Duration Firms

This figure compares the proportion of high duration firm-years in the data with the average proportion of high duration firms from the model simulations, where the simulations have the same short- and long-term discount rates in case 1 and case 2. In the data, high duration firms are defined as firms that have higher expected equity duration than the overall sample median duration across firms and years. In both the early and later periods, we compute the proportion of high duration firm-years. In the model simulations, high duration firms are defined as firms that have higher pre-boom long-term capital share (amount of pre-boom capital divided by amount of total capital) than the overall sample median pre-boom long-term capital share across firms and years. In both early and later period simulations, we compute the proportion of high duration firm-years. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

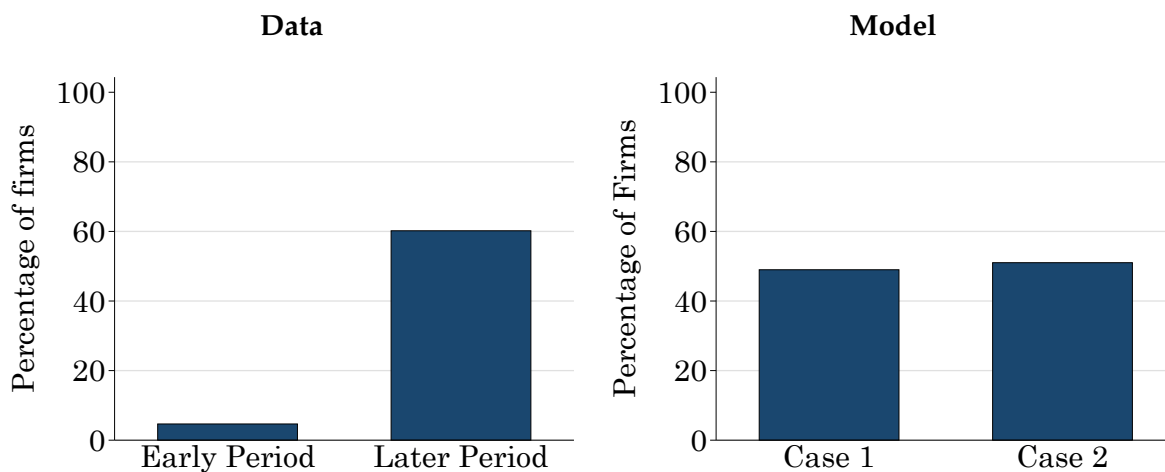


Figure IA.5: Same Short- and Long-Term Discount Rates: Profitability of Newly IPO'd Firms

This figure compares the average profitability of new firms in the data (left) and from the model simulations (right) with the same short- and long-term discount rates in case 1 and case 2. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

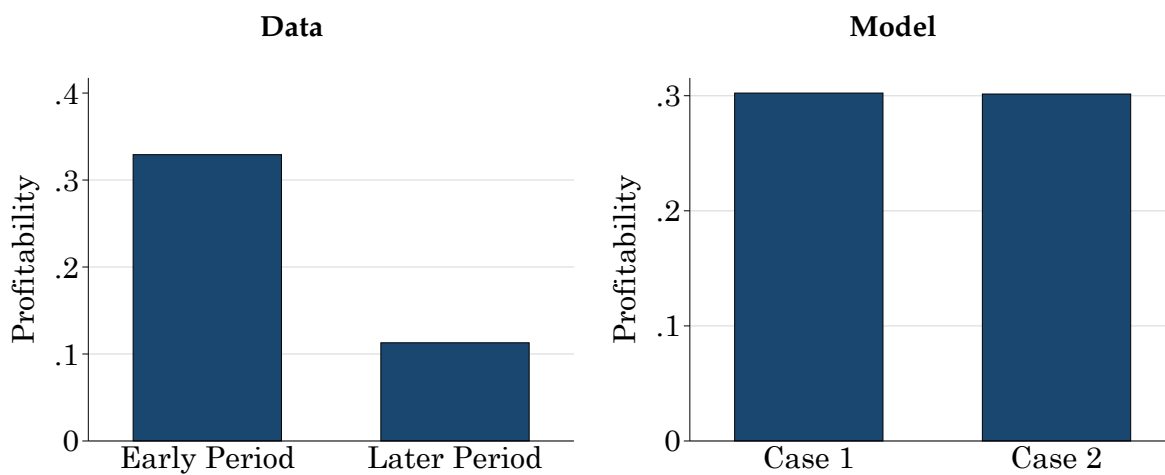


Figure IA.6: Same Short- and Long-Term Discount Rates: Firm Profitability and Investment Before and After 1979

This figure compares the mean (industry-adjusted) investment by profitability decile in the data (left) and from the model simulations (right) with the same short- and long-term discount rates in case 1 and case 2. Subfigures (a) and (b) compare data and model results in the pre-1979 period, and subfigures (c) and (d) compare results from the post-1979 period. The data figures are constructed following Figure 5 where investment is measured as asset growth and profitability is measured as operating profitability. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

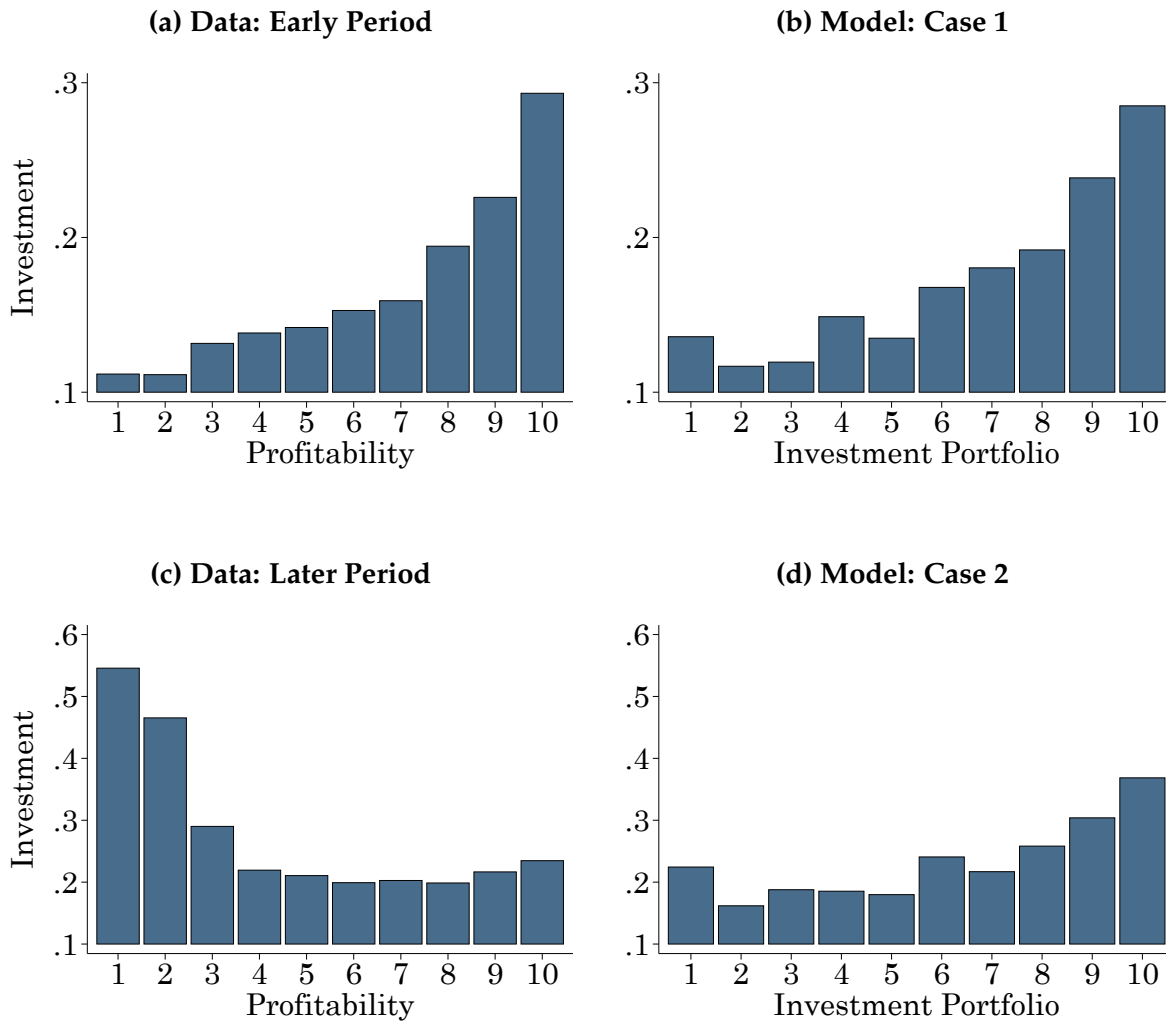


Figure IA.7: Same Short- and Long-Term Discount Rates: Returns of Portfolios Sorted by Profitability

This figure compares the value-weighted profitability decile portfolio annual returns in the data (left) and from the model simulations (right) with the same short- and long-term discount rates in case 1 and case 2. Subfigures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

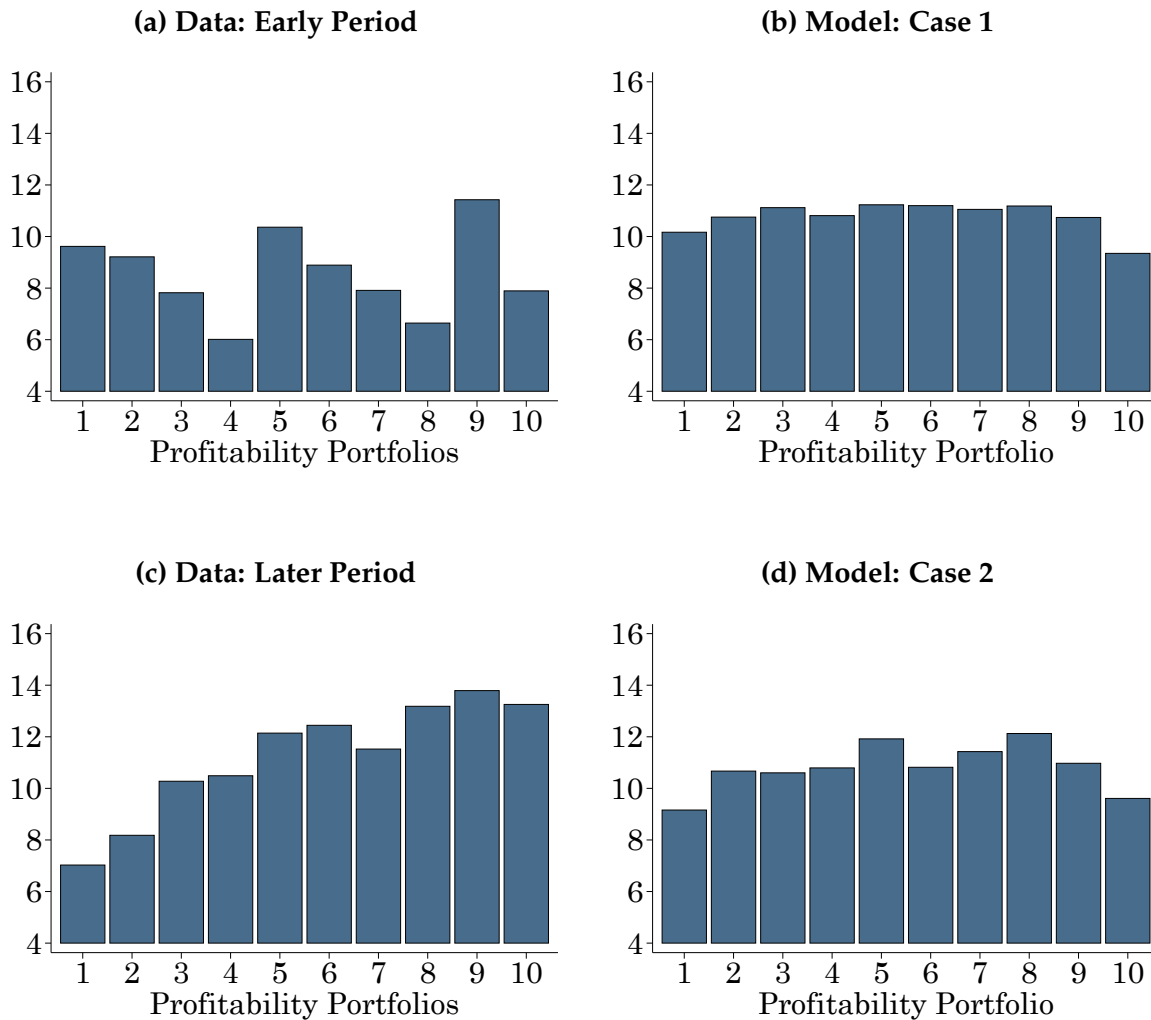


Figure IA.8: Same Short- and Long-Term Discount Rates: Returns of Portfolios Sorted by Investment

This figure compares the value-weighted investment decile portfolio annual returns in the data (left) and from the model simulations (right) with the same short- and long-term discount rates in case 1 and case 2. Subfigures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

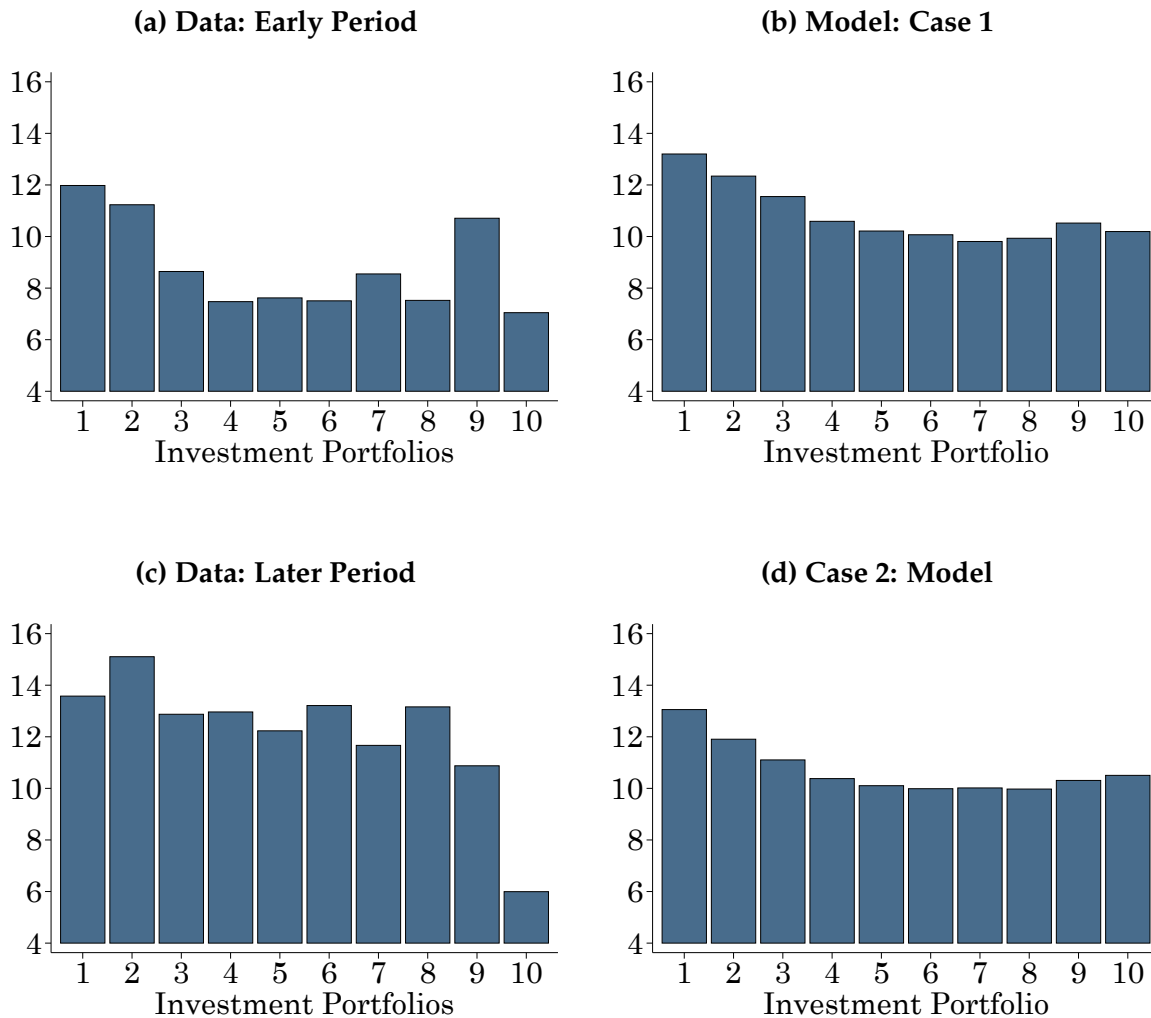


Figure IA.9: No Firm-Level Discount Rate Variation: Share of High Duration Firms

This figure compares the proportion of high duration firm-years in the data with the average proportion of high duration firms from the model simulations without firm-level discount rate variation. In the data, high duration firms are defined as firms that have higher expected equity duration than the overall sample median duration across firms and years. In both the early and later periods, we compute the proportion of high duration firm-years. In the model simulations, high duration firms are defined as firms that have higher pre-boom long-term capital share (amount of pre-boom capital divided by amount of total capital) than the overall sample median pre-boom long-term capital share across firms and years. In both early and later period simulations, we compute the proportion of high duration firm-years. The model results are computed as the average from 150 simulations. See Internet Appendix [IA.2](#) for the parameter values used in the model simulations.

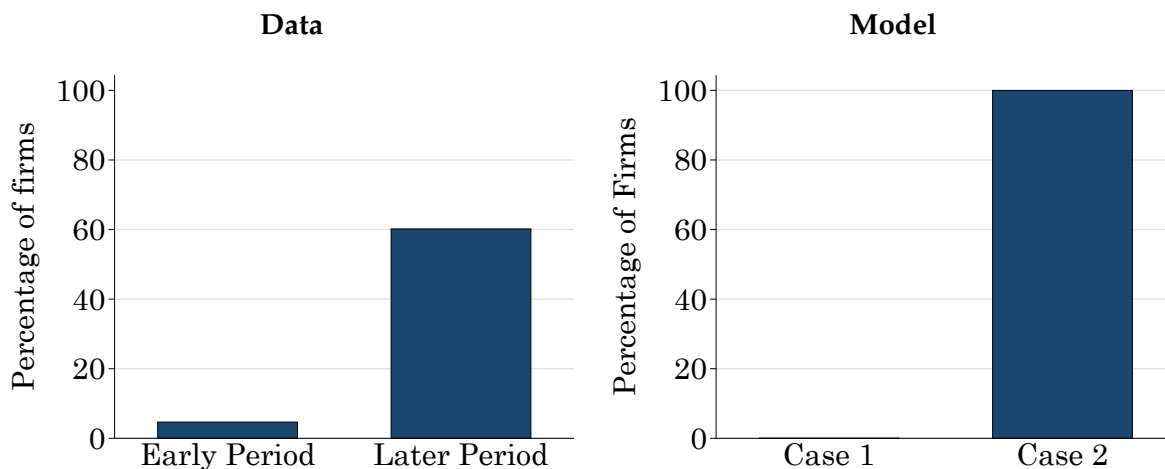


Figure IA.10: No Firm-Level Discount Rate Variation: Profitability of Newly IPO'd Firms

This figure compares the average profitability of new firms in the data (left) and from the model simulations (right) without firm-level discount rate variation. The model results are computed as the average from 150 simulations. See Internet Appendix [IA.2](#) for the parameter values used in the model simulations.

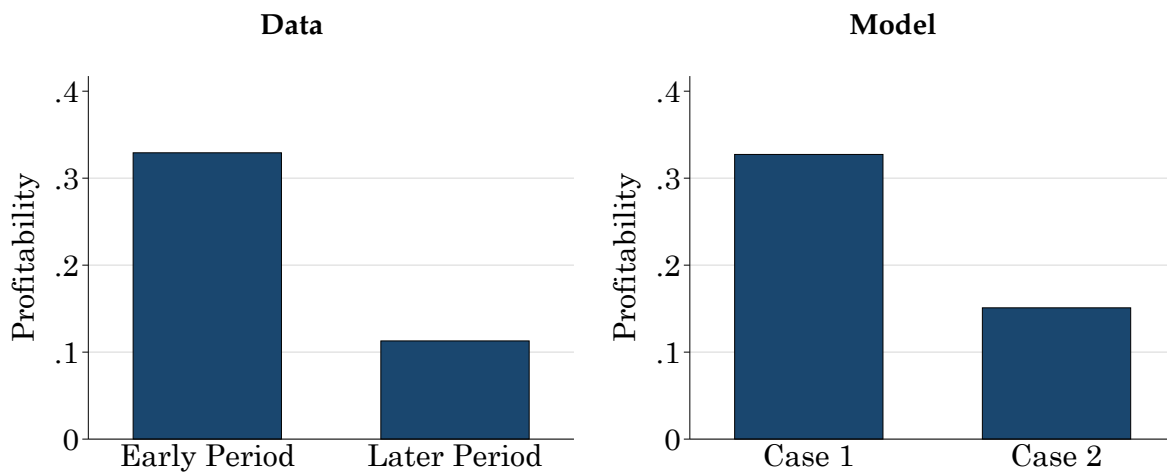


Figure IA.11: No Firm-Level Discount Rate Variation: Firm Profitability and Investment Before and After 1979

This figure compares the mean (industry-adjusted) investment by profitability decile in the data (left) and from the model simulations (right) without firm-level discount rate variation. Subfigures (a) and (b) compare data and model results in the pre-1979 period, and subfigures (c) and (d) compare results from the post-1979 period. The data figures are constructed following Figure 5 where investment is measured as asset growth and profitability is measured as operating profitability. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

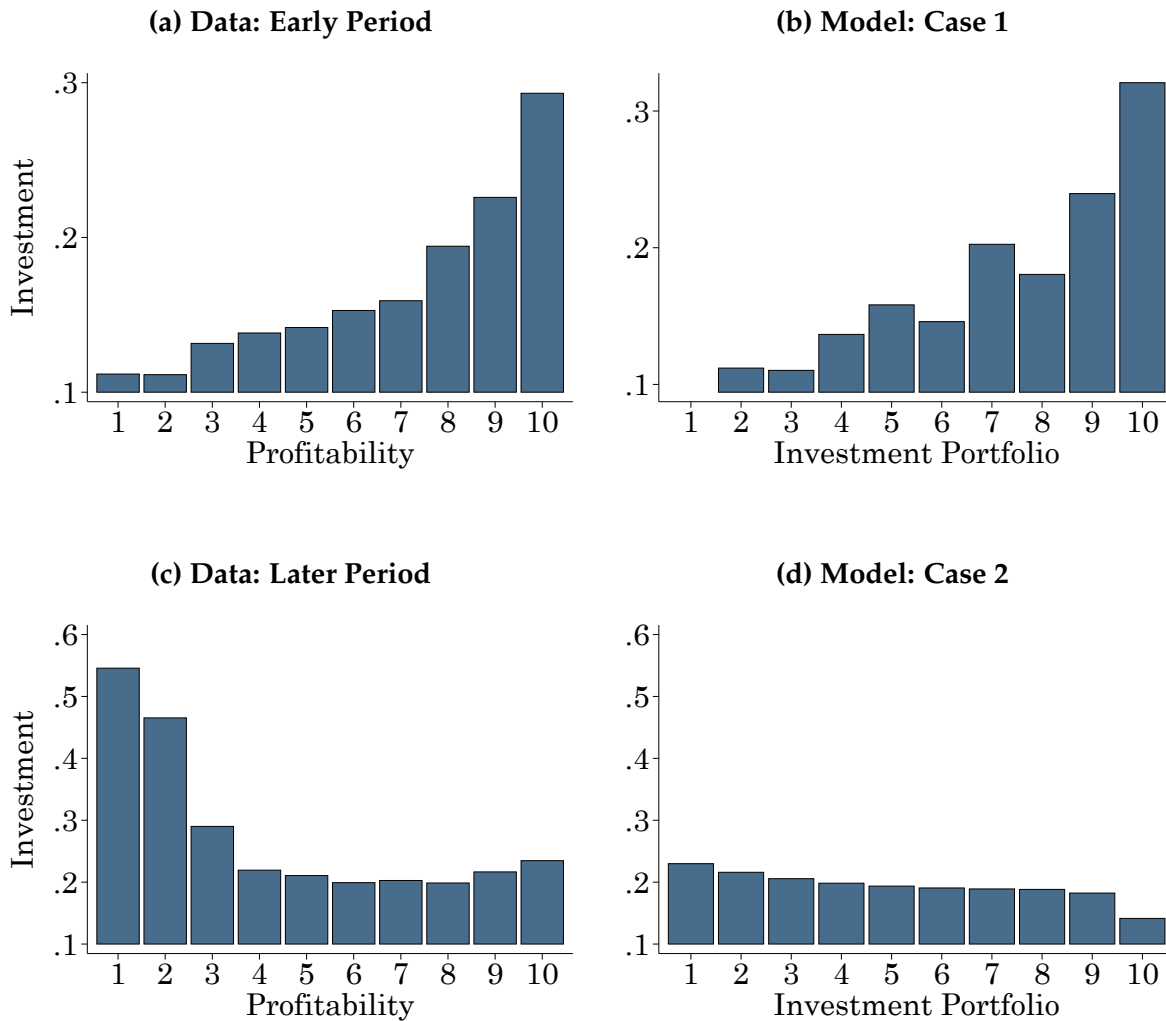


Figure IA.12: No Firm-Level Discount Rate Variation: Returns of Portfolios Sorted by Profitability

This figure compares the value-weighted profitability decile portfolio annual returns in the data (left) and from the model simulations (right) without firm-level discount rate variation. Subfigures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

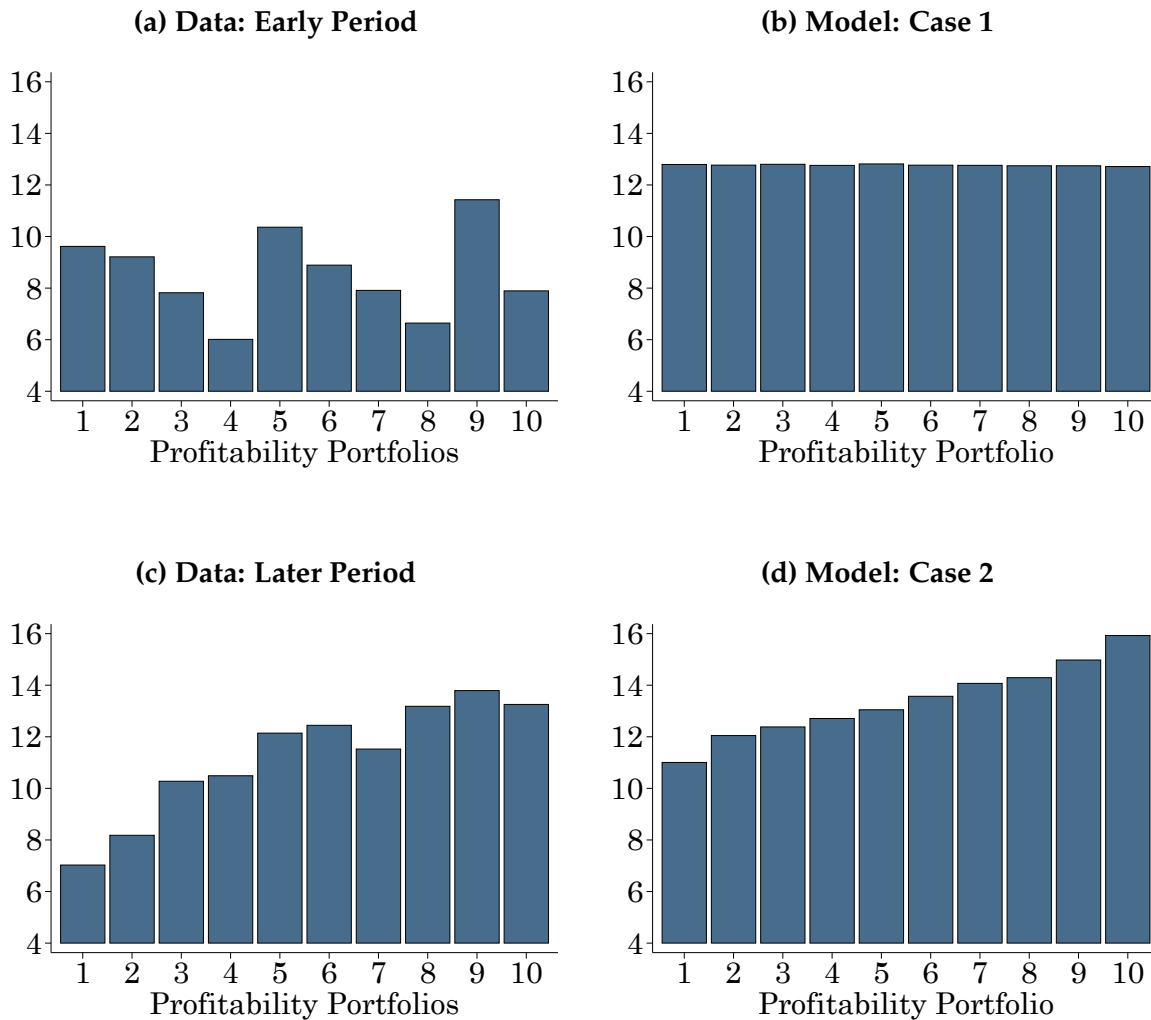


Figure IA.13: No Firm-Level Discount Rate Variation: Returns of Portfolios Sorted by Investment

This figure compares the value-weighted investment decile portfolio annual returns in the data (left) and from the model simulations (right) with without firm-level discount rate variation. Sub-figures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

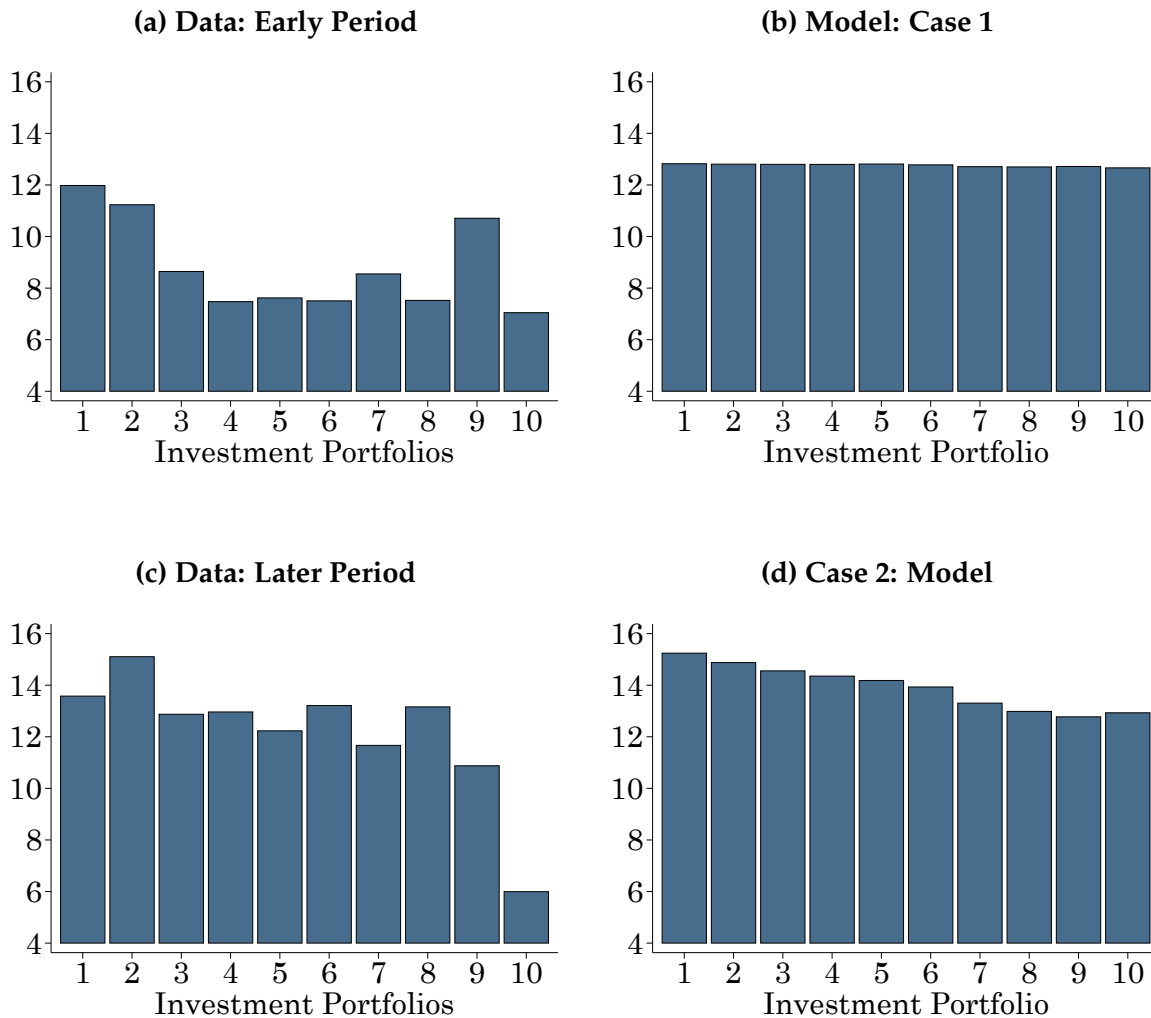


Figure IA.14: Same Entry Parameters: Share of High Duration Firms

This figure compares the proportion of high duration firm-years in the data with the average proportion of high duration firms from the model simulations with the same entry parameters in both cases. In the data, high duration firms are defined as firms that have higher expected equity duration than the overall sample median duration across firms and years. In both the early and later periods, we compute the proportion of high duration firm-years. In the model simulations, high duration firms are defined as firms that have higher pre-boom long-term capital share (amount of pre-boom capital divided by amount of total capital) than the overall sample median pre-boom long-term capital share across firms and years. In both early and later period simulations, we compute the proportion of high duration firm-years. The model results are computed as the average from 150 simulations. See Internet Appendix [IA.2](#) for the parameter values used in the model simulations.

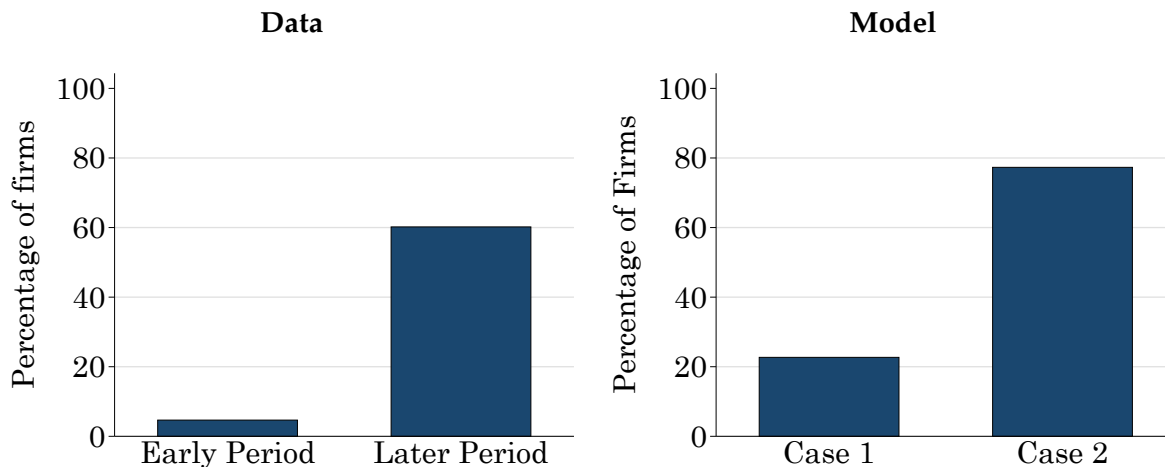


Figure IA.15: Same Entry Parameters: Profitability of Newly IPO'd Firms

This figure compares the average profitability of new firms in the data (left) and from the model simulations (right) with the same entry parameters in both cases. The model results are computed as the average from 150 simulations. See Internet Appendix [IA.2](#) for the parameter values used in the model simulations.

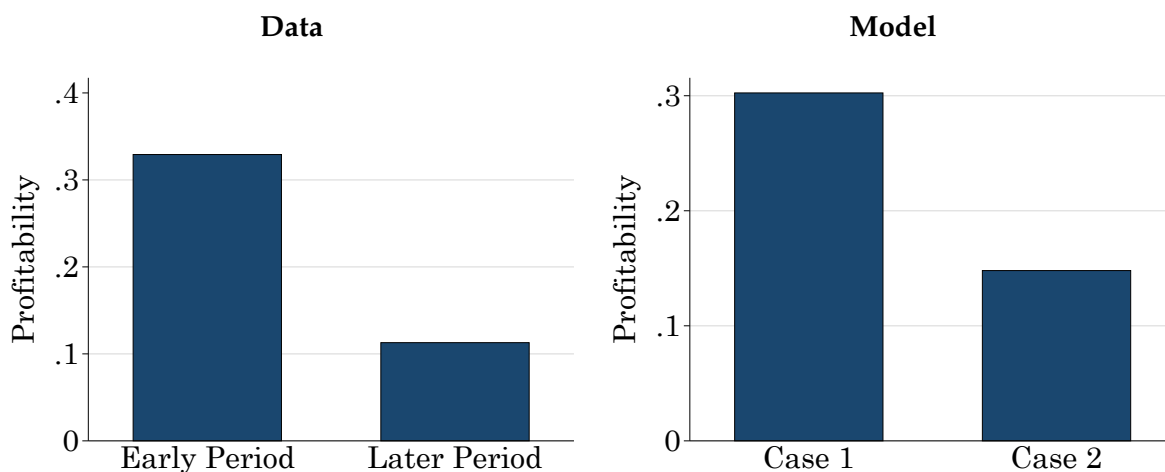


Figure IA.16: Firm Profitability and Investment Before and After 1979

This figure compares the mean (industry-adjusted) investment by profitability decile in the data (left) and from the model simulations (right) with the same entry parameters in both cases. Sub-figures (a) and (b) compare data and model results in the pre-1979 period, and subfigures (c) and (d) compare results from the post-1979 period. The data figures are constructed following Figure 5 where investment is measured as asset growth and profitability is measured as operating profitability. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

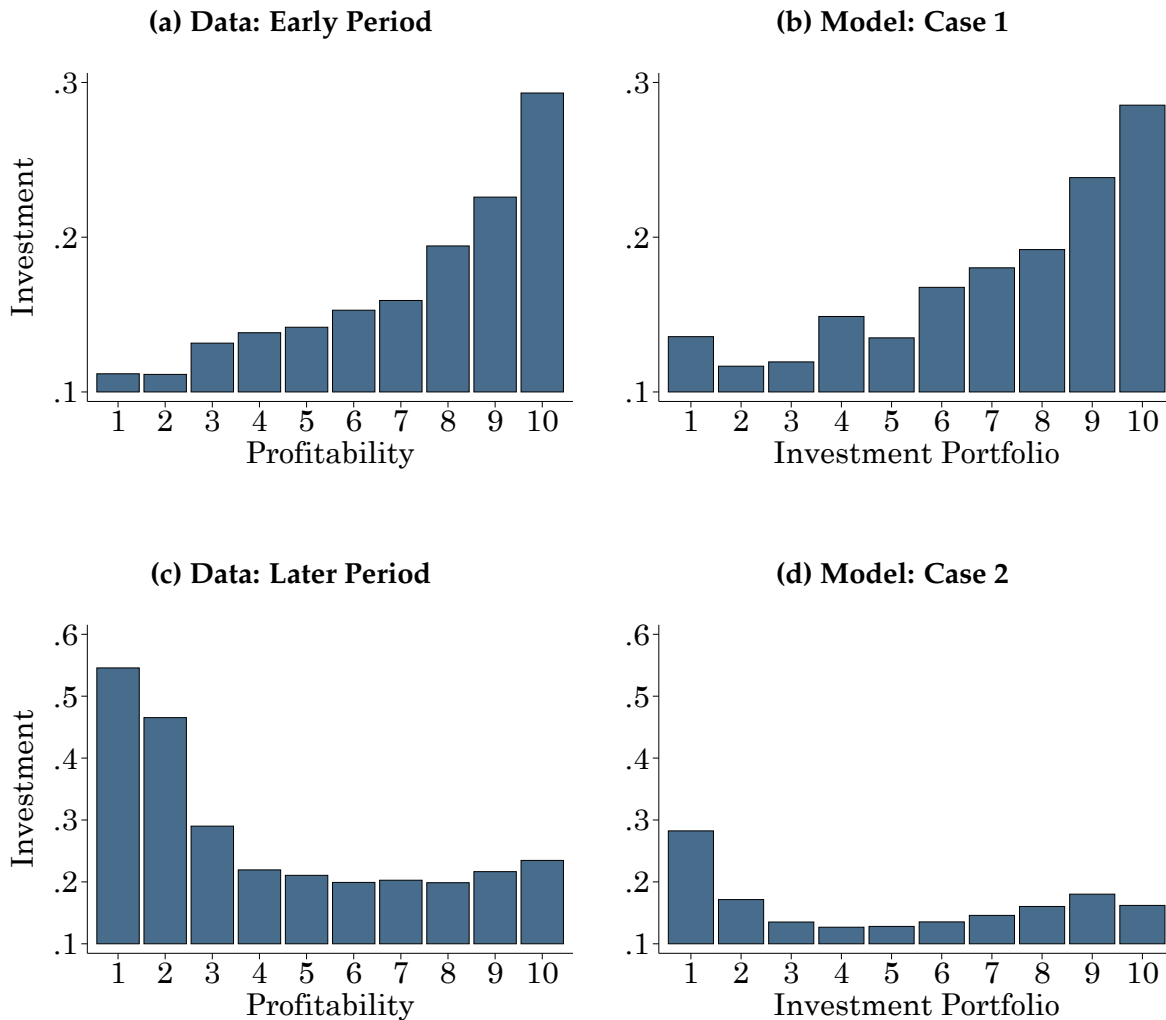


Figure IA.17: Same Entry Parameters: Returns of Portfolios Sorted by Profitability

This figure compares the value-weighted profitability decile portfolio annual returns in the data (left) and from the model simulations (right) with the same entry parameters in both cases. Sub-figures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

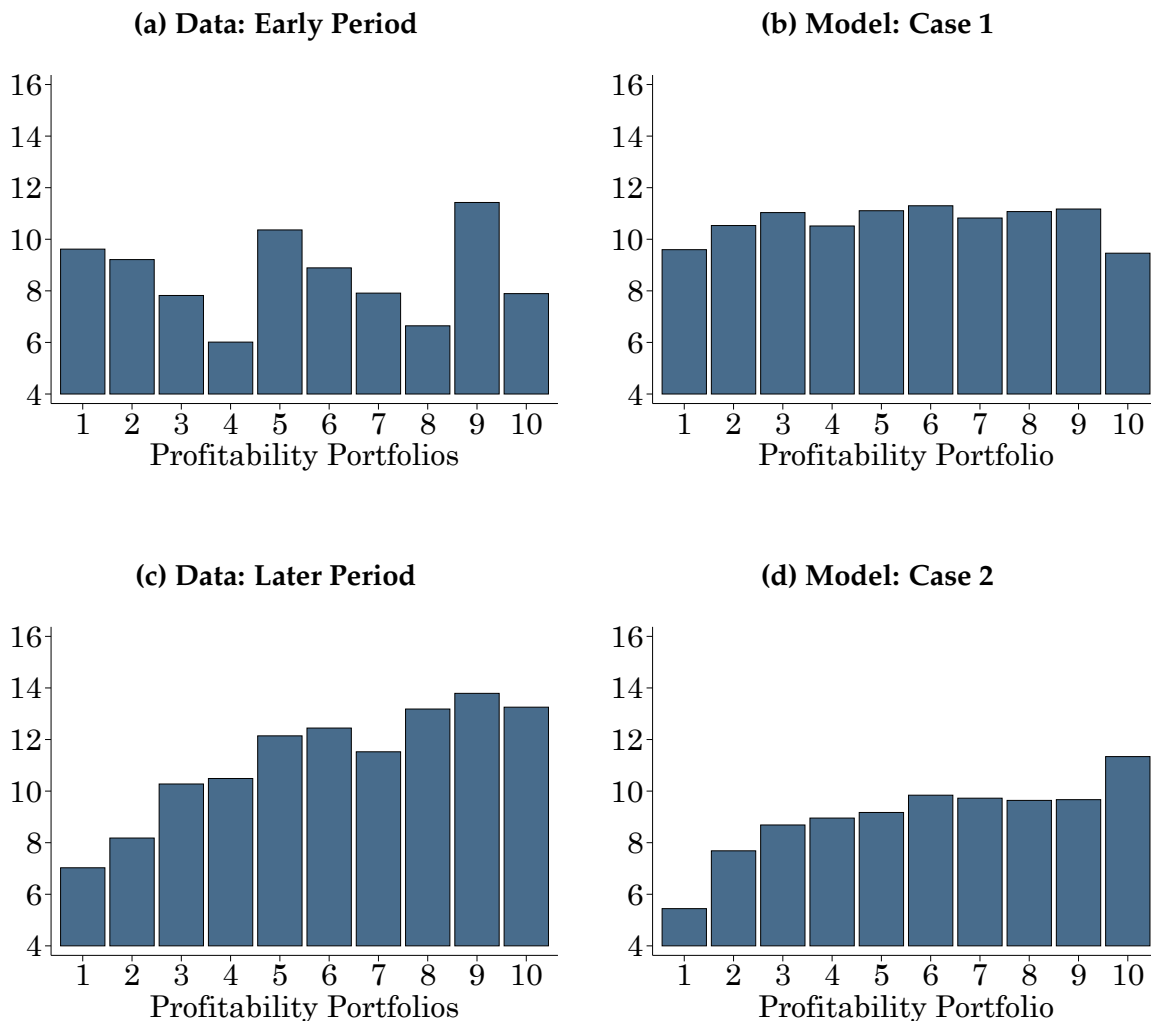


Figure IA.18: Same Entry Parameters: Returns of Portfolios Sorted by Investment

This figure compares the value-weighted investment decile portfolio annual returns in the data (left) and from the model simulations (right) with the same entry parameters in both cases. Sub-figures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

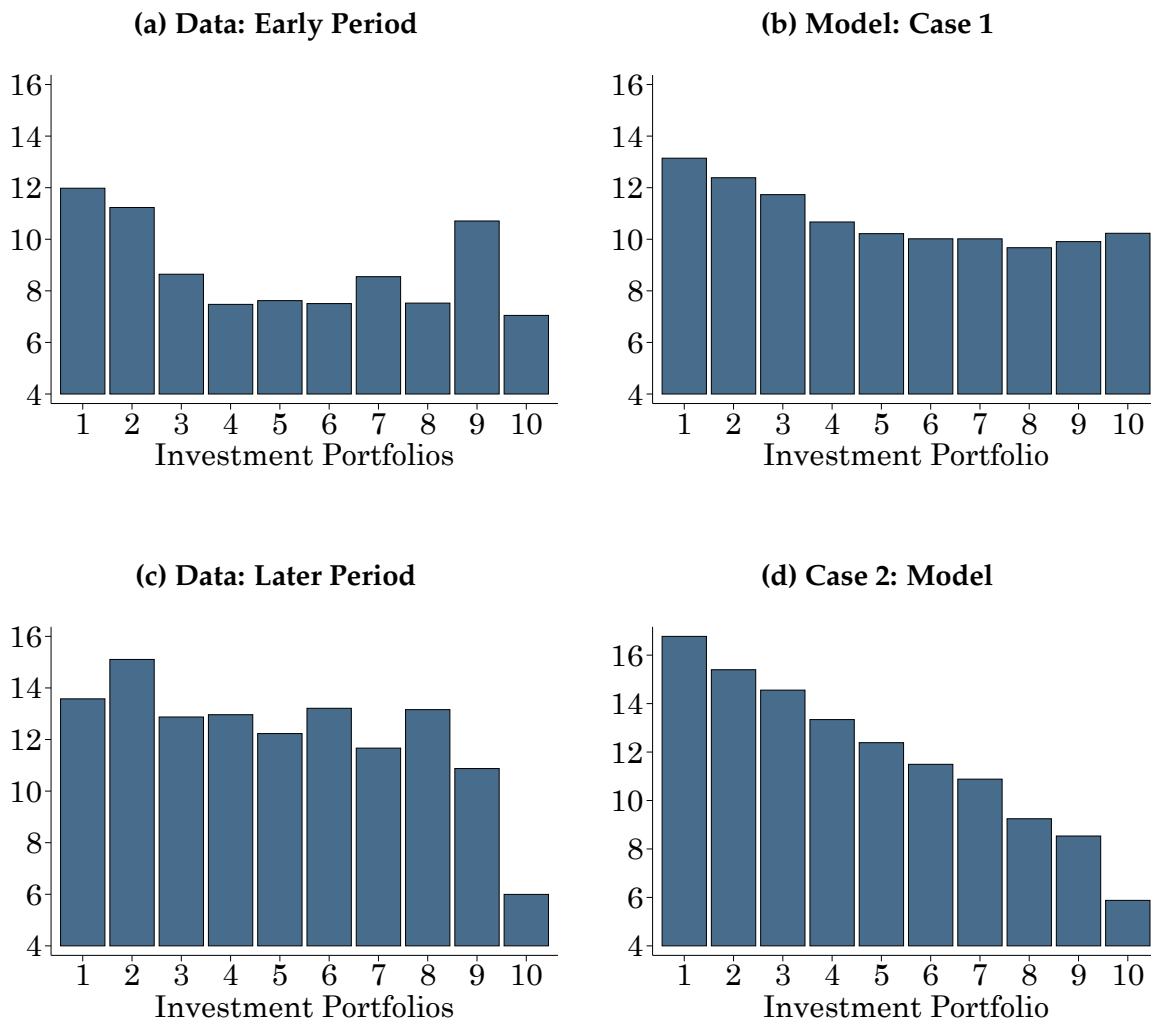


Figure IA.19: No Entry and Exit: Share of High Duration Firms

This figure compares the proportion of high duration firm-years in the data with the average proportion of high duration firms from the model simulations without entry and exit. In the data, high duration firms are defined as firms that have higher expected equity duration than the overall sample median duration across firms and years. In both the early and later periods, we compute the proportion of high duration firm-years. In the model simulations, high duration firms are defined as firms that have higher pre-boom long-term capital share (amount of pre-boom capital divided by amount of total capital) than the overall sample median pre-boom long-term capital share across firms and years. In both early and later period simulations, we compute the proportion of high duration firm-years. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

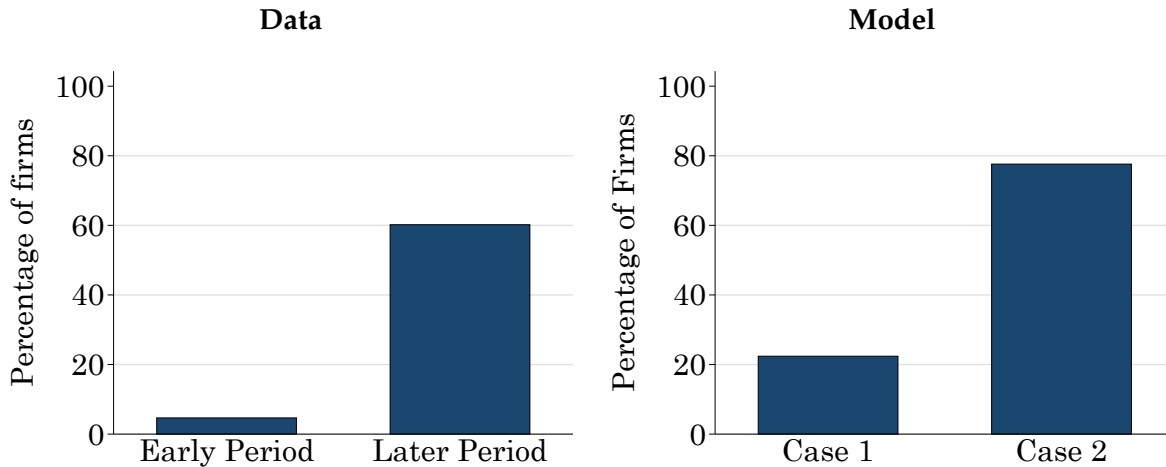


Figure IA.20: No Entry and Exit: Firm Profitability and Investment Before and After 1979

This figure compares the mean (industry-adjusted) investment by profitability decile in the data (left) and from the model simulations (right) without entry and exit. Subfigures (a) and (b) compare data and model results in the pre-1979 period, and subfigures (c) and (d) compare results from the post-1979 period. The data figures are constructed following Figure 5 where investment is measured as asset growth and profitability is measured as operating profitability. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

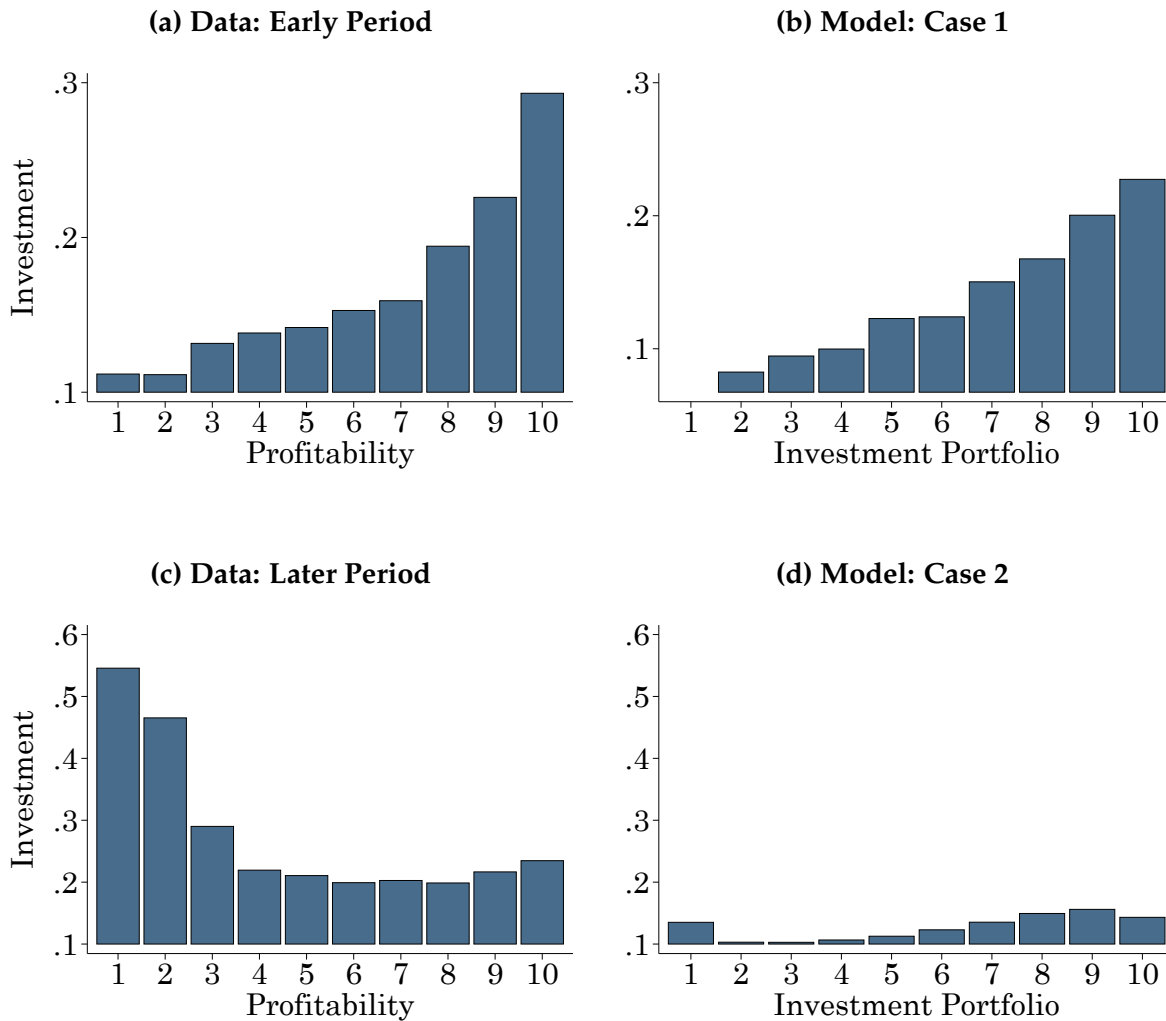


Figure IA.21: No Entry and Exit: Returns of Portfolios Sorted by Profitability

This figure compares the value-weighted profitability decile portfolio annual returns in the data (left) and from the model simulations (right) without entry and exit. Subfigures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

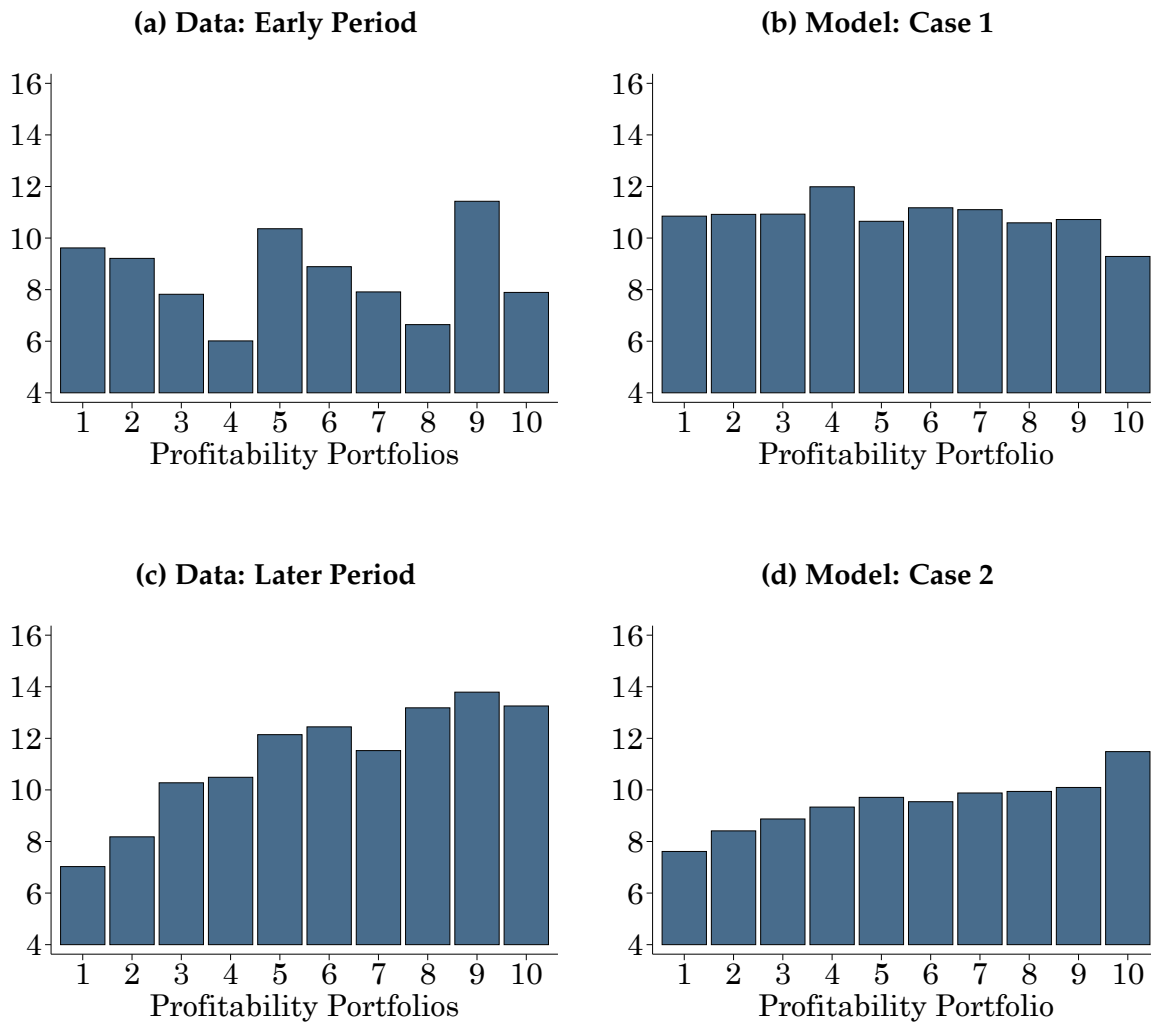


Figure IA.22: No Entry and Exit: Returns of Portfolios Sorted by Investment

This figure compares the value-weighted investment decile portfolio annual returns in the data (left) and from the model simulations (right) without entry and exit. Subfigures (a) and (b) compare data and model returns from July 1963 to June 1980, and subfigures (c) and (d) compare returns from July 1980 to June 2018. The model results are computed as the average from 150 simulations. See Internet Appendix IA.2 for the parameter values used in the model simulations.

