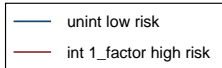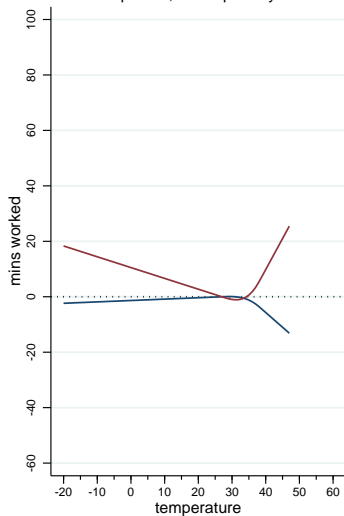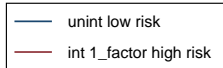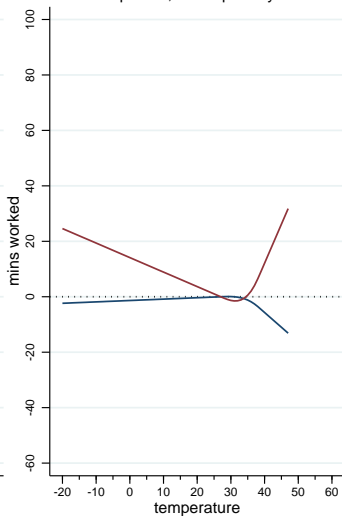overlaid_sf_middle