Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
TBI	9	There is a risk that an increase in average annual temperature may result in increased costs of road maintenance/construction impacting local economy	Unlikely	Insignificant	Low
TCI	10	There is a risk that an increase in average annual temperature may result in increased costs of road maintenance/construction impacting upon existing community structures and lifestyle enjoyed by LGA residents	Likely	Insignificant	Medium
TEI	11	There is a risk that an increase in average annual temperature may result in increased costs of road maintenance/construction impacting upon sound public administration and good governance	Likely	Insignificant	Medium
TAI	12	There is a risk that due to an increase in ambient temperature, incidents of dehydration/heat stress amongst outdoor staff may increase	Possible	Insignificant	Low
TAR	13	There is a risk that due to an increase in ambient temperature, incidents of dehydration/heat stress amongst outdoor staff may increase	Possible	Insignificant	Low
TAH	14	There is a risk that due to an increase in ambient temperature, incidents of dehydration/heat stress amongst outdoor staff may increase	Likely	Insignificant	Medium
TAN	15	There is a risk that due to an increase in ambient temperature, incidents of dehydration/heat stress amongst outdoor staff may increase	Likely	Insignificant	Medium
TAW	17	There is a risk that due to an increase in ambient temperature, incidents of dehydration/heat stress amongst outdoor staff may increase	Likely	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
TEI	18	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TER	19	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TEH	20	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TEP	21	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TEN	22	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TEW	23	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
TAI	24	As a result of the projected 0.2℃ - 1.8℃ there is a risk that there will be a greater demand for shade structures at Council recreational facilities. A failure to address this risk could lead to Councils exposure to public liability claims arising from impacts upon public safety increasing.	Almost Certain	Insignificant	Medium
TAR	25	As a result of the projected 0.2℃ - 1.8℃ there is a risk that there will be a greater demand for shade structures at Council recreational facilities. A failure to address this risk could lead to Councils exposure to public liability claims arising from impacts upon public safety increasing.	Almost Certain	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
TAI	26	There is a risk that as a result of an increase in average annual temperature the working practices of outdoor working staff within the Infrastructure & Property Services functional areas of Council may have to be amended to give consideration to evolving climatic conditions and minimise their exposure to health/safety risks.	Unlikely	Insignificant	Low
TAR	27	There is a risk that as a result of an increase in average annual temperature the working practices of outdoor working staff within the Infrastructure & Property Services functional areas of Council may have to be amended to give consideration to evolving climatic conditions and minimise their exposure to health/safety risks.	Unlikely	Insignificant	Low
TAW	28	There is a risk that as a result of an increase in average annual temperature the working practices of outdoor working staff within the Infrastructure & Property Services functional areas of Council may have to be amended to give consideration to evolving climatic conditions and minimise their exposure to health/safety risks.	Unlikely	Insignificant	Low
TEI	29	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium
TER	30	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium
TEH	31	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium
TEP	32	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
TEN	33	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium
TEW	34	There is a risk that due to the projected increase in ambient annual temperature Council will be faced with increased levels of expenditure to pay for electricity supply to all assets/buildings which in turn would increase the level of demand/expectation currently experienced by the administrative and governance functions of Council.	Almost Certain	Insignificant	Medium

Scenario for Hot Days (HD) : There is a risk that there will be an additional 1-14 hot days by 2030.

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
HDEI	1	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDER	2	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDEH	3	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDEP	4	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDEN	5	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDEW	6	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
HDAI	7	There is a risk that due to an increase in the number of hot days there may be reduced thermal comfort and/or increased cooling system loads within Council buildings, leading to a break down of those systems, impacting upon the safety and wellbeing of building users.	Likely	Insignificant	Medium
HDEI	8	There is a risk that due to an increase in the number of hot days there may be reduced thermal comfort and/or increased cooling system loads within Council buildings, leading to a break down of those systems, impacting upon sound public administration and good governance.	Likely	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
HDAR	9	There is a risk that due to an increase in the number of hot days operational staff & contractors and volunteers may be exposed to adverse health risks (sun exposure, heat stress, heat stroke, dehydration) (Operational Management Planning)	Likely	Insignificant	Medium
HDAN	10	There is a risk that due to an increase in the number of hot days operational staff & contractors and volunteers may be exposed to adverse health risks (sun exposure, heat stress, heat stroke, dehydration) (Operational Management Planning)	Likely	Insignificant	Medium
HDAW	11	There is a risk that due to an increase in the number of hot days operational staff & contractors and volunteers may be exposed to adverse health risks (sun exposure, heat stress, heat stroke, dehydration) (Operational Management Planning)	Likely	Insignificant	Medium
HDAR	12	There is a risk that an increase in the number of hot days where the ambient temperature exceeds 35o C there may be an expectation in Council to provide greater amenities at recreational facilities, (e.g. shade structures).	Likely	Insignificant	Medium
HDCR	13	There is a risk that an increase in the number of hot days where the ambient temperature exceeds 35o C there may be an expectation in Council to provide greater amenities at recreational facilities, (e.g. shade structures).	Likely	Insignificant	Medium
HDER	14	There is a risk that an increase in the number of hot days where the ambient temperature exceeds 35o C there may be an expectation in Council to provide greater amenities at recreational facilities, (e.g. shade structures).	Likely	Insignificant	Medium
HDAW	15	There is a risk that due to an increase in the number of hot days where the ambient temperature exceeds 35o C there will be a significant increase in peak water demand on and/or close to those days.	Likely	Insignificant	Medium
HDCW	16	There is a risk that due to an increase in the number of hot days where the ambient temperature exceeds 35o C there will be a significant increase in peak water demand on and/or close to those days.	Likely	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
HDDW	17	There is a risk that due to an increase in the number of hot days where the ambient temperature exceeds 35o C there will be a significant increase in peak water demand on and/or close to those days.	Likely	Insignificant	Medium
HDEW	18	There is a risk that due to an increase in the number of hot days where the ambient temperature exceeds 35o C there will be a significant increase in peak water demand on and/or close to those days.	Likely	Insignificant	Medium
HDAI	19	There is a risk that due to an increase in extreme heat events, Council may be obliged to undertake maintenance of transport infrastructure on a more frequent basis to minimise incidence of bitumen bleeding	Almost Certain	Insignificant	Medium
HDBI	20	There is a risk that due to an increase in extreme heat events, Council may be obliged to undertake maintenance of transport infrastructure on a more frequent basis to minimise incidence of bitumen bleeding	Almost Certain	Insignificant	Medium
HDCI	21	There is a risk that due to an increase in extreme heat events, Council may be obliged to undertake maintenance of transport infrastructure on a more frequent basis to minimise incidence of bitumen bleeding	Almost Certain	Insignificant	Medium
HDEI	22	There is a risk that due to an increase in extreme heat events, Council may be obliged to undertake maintenance of transport infrastructure on a more frequent basis to minimise incidence of bitumen bleeding	Almost Certain	Insignificant	Medium
HDAI	23	There is a risk that due to an increase in the number of hot days there may be increased heat stress amongst vulnerable community members (elderly, infirm and young) within Council facilities e.g. libraries	Unlikely	Minor	Low
HDAH	24	There is a risk that due to an increase in the number of hot days there may be increased heat stress amongst vulnerable community members (elderly, infirm and young) within Council facilities e.g. libraries	Unlikely	Minor	Low

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
HDCR	25	There is a risk that due to an increase in the number of hot days there may be changes in the patterns of demand for assets that allow for longer use of recreational facilities including. lighting, irrigation	Likely	Insignificant	Medium
HDER	26	There is a risk that due to an increase in the number of hot days there may be changes in the patterns of demand for assets that allow for longer use of recreational facilities including. lighting, irrigation	Likely	Insignificant	Medium
HDCR	27	There is a risk that as a result of an increase in the number of Hot Days Council may experience a greater demand for the irrigation of parks and sporting grounds	Likely	Insignificant	Medium
HDER	28	There is a risk that as a result of an increase in the number of Hot Days Council may experience a greater demand for the irrigation of parks and sporting grounds	Likely	Insignificant	Medium
HDAR	29	Increase in number of hot days above 35 degrees could increase the risk of tree limb drop resulting in potential personal injury or property damage	Likely	Insignificant	Medium
HDAN	30	Increase in number of hot days above 35 degrees could increase the risk of tree limb drop resulting in potential personal injury or property damage	Likely	Insignificant	Medium
HDAI	31	There is a risk that an increase in the number of hot days will result in an increased demand for water carts to maintain/repair roads infrastructure, as well as requirements for dust suppression	Almost Certain	Minor	High
HDDI	32	There is a risk that an increase in the number of hot days will result in an increased demand for water carts to maintain/repair roads infrastructure, as well as requirements for dust suppression	Almost Certain	Minor	High

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
HDEI	33	There is a risk that an increase in the number of hot days will result in an increased demand for water carts to maintain/repair roads infrastructure, as well as requirements for dust suppression	Almost Certain	Minor	High
HDAN	34	There is a risk that an increase in the number of hot days will result in an increased demand for water carts to maintain/repair roads infrastructure, as well as requirements for dust suppression	Almost Certain	Minor	High

Scenario for Rainfall (R) : There is a risk that the average annual rainfall will reduce by 13% by 2030.

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RDH	1	There is a risk that as a result of a decrease in average rainfall levels, Council will be faced with increased costs for weed control/noxious pest control	Almost Certain	Insignificant	Medium
RAH	2	There is a risk that as a result of a decrease in average rainfall levels, Council will be faced with increased costs for roadside vegetation control	Almost Certain	Moderate	High
RDH	3	There is a risk that as a result of a decrease in average rainfall levels, Council will be faced with increased costs for weed control/noxious pest control and roadside vegetation control	Almost Certain	Insignificant	Medium
REH	4	There is a risk that as a result of a decrease in average rainfall levels, Council will be faced with increased costs for weed control/noxious pest control and roadside vegetation control	Almost Certain	Moderate	High
REI	5	There is a risk that a decrease in average annual rainfall may result in increased operational use of plant and equipment (AC, Lawn mowers)	Almost Certain	Minor	High
REI	6	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RER	7	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
REH	8	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
REP	9	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
REN	10	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
REW	11	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RAW	12	Due to reduced water inflow into catchment areas there will be less water available within water storage areas for potable drinking water (town water)	Likely	Minor	Medium
RBW	13	Due to reduced water inflow into catchment areas there will be less water available within water storage areas for potable drinking water (town water)	Likely	Minor	Medium
RCW	14	Due to reduced water inflow into catchment areas there will be less water available within water storage areas for potable drinking water (town water)	Likely	Minor	Medium
REW	15	Due to reduced water inflow into catchment areas there will be less water available within water storage areas for potable drinking water (town water)	Likely	Minor	Medium
RBW	16	Due to lower average annual rainfall there is a risk that there will be less water within the shire available for irrigation purposes.	Likely	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RBW	18	There is a risk that due to diminishing water supplies, Council will be unable to meet the demands of local industries (abattoir) for water.	Unlikely	Major	Medium
RBW	19	There is a risk that due to decreased average annual rainfall, stream inflow into catchments may get to a level whereby Council finds it increasingly difficult to encourage new businesses to set up within the Gundagai shire LGA	Likely	Insignificant	Medium
RDW	20	As a result of decreased rainfall levels there is a risk that there will be an increased incidence e of sediment entering the river system as a result of reduced ground coverage	Likely	Insignificant	Medium
RDN	21	As a result of decreased rainfall levels there is a risk that there will be an increased incidence e of sediment entering the river system as a result of reduced ground coverage	Likely	Insignificant	Medium
RAH	22	Due to reduced rainfall levels there will be a reduction in fire fighting capacity within rural, remote and village areas (Strategic planning consideration)	Likely	Moderate	High
RCH	23	Due to reduced rainfall levels there will be a reduction in fire fighting capacity within rural, remote and village areas (Strategic planning consideration)	Likely	Moderate	High
RDH	24	Due to reduced rainfall levels there will be a reduction in fire fighting capacity within rural, remote and village areas (Strategic planning consideration)	Likely	Moderate	High
REH	25	Due to reduced rainfall levels there will be a reduction in fire fighting capacity within rural, remote and village areas (Strategic planning consideration)	Likely	Moderate	High

Scenario for Fire Weather (FW) : There is a risk that the number of days annually when the Forest Fire Danger Index (FFDI) is very high or extreme will increase by 3-5 days by 2030.

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
FWEI	1	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWER	2	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWEH	3	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWEP	4	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWEN	5	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWEW	6	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
FWAH	7	There is a risk that the number of days annually when the FFDI is very high or extreme will increase and have a greater risk to public safety.	Likely	Major	High
FWAI	8	There is a risk that the number of days annually when the FFDI is very high or extreme Council will face increased obligations to manage fire trails and monitor fuel loads (Strategic planning consideration)	Likely	Insignificant	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
FWCI	9	There is a risk that the number of days annually when the FFDI is very high or extreme Council will face increased obligations to manage fire trails and monitor fuel loads (Strategic planning consideration)	Likely	Insignificant	Medium
FWEI	10	There is a risk that the number of days annually when the FFDI is very high or extreme Council will face increased obligations to manage fire trails and monitor fuel loads (Strategic planning consideration)	Likely	Insignificant	Medium
FWDI	11	There is a risk that the number of days annually when the FFDI is very high or extreme Council will face increased obligations to manage fire trails and monitor fuel loads (Strategic planning consideration)	Likely	Insignificant	Medium
FWEI	12	There is a risk that as a result of an increase in the number of days where the FFDI is either Extreme or Catastrophic there could be increased fire damage to council assets will increase clean-up and maintenance costs	Possible	Minor	Medium
FWER	13	There is a risk that as a result of an increase in the number of days where the FFDI is either Extreme or Catastrophic there could be increased fire damage to council assets will increase clean-up and maintenance costs	Possible	Minor	Medium
FWAW	14	There is a risk that as a result of a fire event on such days, Councils raw water catchment area could be impacted by pollutants from fire e.g. ash, debris, chemicals from fire fighting	Possible	Insignificant	Low
FWDW	15	There is a risk that as a result of a fire event on such days, Councils raw water catchment area could be impacted by pollutants from fire e.g. ash, debris, chemicals from fire fighting	Possible	Insignificant	Low
FWEW	16	There is a risk that as a result of a fire event on such days, Councils raw water catchment area could be impacted by pollutants from fire e.g. ash, debris, chemicals from fire fighting	Possible	Minor	Medium

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
FWAH	17	There is a risk that as a result of an increase in the number of days where the number of days where the FFDI is Extreme or Catastrophic that fire mitigation strategies i.e. hazard reduction, may not be able to be undertaken and thus increase the vegetation fuel load	Possible	Minor	Medium
FWEI	18	There is a risk that as a result of an increase in the number of days where the FFDI is either extreme or catastrophic, there may be an increase in the amount of downtime of operational staff and subsequent impacts/consequences for productivity in relation to Council activities	Likely	Minor	Medium
FWEI	19	There is a risk that as a result of an increase in the number of days where the FFDI is either extreme or catastrophic, there may be an increase in the amount of downtime of operational staff and subsequent cost impacts for Council	Likely	Minor	Medium

Scenario for Rain Intensity (RI) : There is a risk that intense rain periods (i.e. the number of 1 in 40 year one day events) will increase by 7% by 2030.

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RIEI	1	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIER	2	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIEH	3	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIEP	4	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIEN	5	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIEW	6	There is a risk that Council may have policies/procedures/legislation imposed upon them by State and Federal Government that have detrimental cost implications for Council increasing the levels of pressure/expectation currently placed upon the administrative and governance functions of Council.	Almost Certain	Moderate	High
RIAI	7	In the event that the projected scenario for increased extreme rainfall events is realised, there is a risk that localised flooding will occur with greater frequency and severity across the shire.	Almost Certain	Major	Extreme
RIBI	8	In the event that the projected scenario for increased extreme rainfall events is realised, there is a risk that localised flooding will occur with greater frequency and severity across the shire.	Almost Certain	Major	Extreme

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RICI	9	In the event that the projected scenario for increased extreme rainfall events is realised, there is a risk that localised flooding will occur with greater frequency and severity across the shire.	Almost Certain	Major	Extreme
RIDI	10	In the event that the projected scenario for increased extreme rainfall events is realised, there is a risk that localised flooding will occur with greater frequency and severity across the shire.	Almost Certain	Major	Extreme
RIEI	11	In the event that the projected scenario for increased extreme rainfall events is realised, there is a risk that localised flooding will occur with greater frequency and severity across the shire.	Almost Certain	Major	Extreme
RIEI	12	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low
RIER	13	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low
RIEH	14	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low
RIEP	15	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low
RIEN	16	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RIEW	17	There is a risk that as a result of an increase in intense rainfall events and localised flooding, the damage to Council infrastructure may not meet the threshold for Natural Disaster Declaration and Council would bare the costs for this themselves.	Unlikely	Minor	Low
RIAI	18	There is a risk that due to an increase in intense rainfall events that transport infrastructure (roads, bridges, culverts) would be damaged with greater frequency impacting upon public safety	Likely	Major	High
RICI	19	There is a risk that due to an increase in intense rainfall events that transport infrastructure (roads, bridges, culverts) would be damaged with greater frequency impacting upon existing community structures and lifestyle enjoyed by shire residents	Likely	Major	High
RIDI	20	There is a risk that due to an increase in intense rainfall events that transport infrastructure (roads, bridges, culverts) would be damaged with greater frequency impacting upon the physical and natural environment within Gundagai shire LGA.	Likely	Major	High
RIEI	21	There is a risk that due to an increase in intense rainfall events that transport infrastructure (roads, bridges, culverts) would be damaged with greater frequency impacting upon sound public administration and good governance.	Likely	Major	High
RIAI	22	There is a risk that as a result of increased intense rainfall events Councils urban drainage infrastructure may exceed capacity with greater frequency	Likely	Moderate	High
RIBI	23	There is a risk that as a result of increased intense rainfall events Councils urban drainage infrastructure may exceed capacity with greater frequency	Likely	Moderate	High
RICI	24	There is a risk that as a result of increased intense rainfall events Councils urban drainage infrastructure may exceed capacity with greater frequency	Likely	Moderate	High

Risk Code	Risk Number	Risk Description	Likelihood	Consequence	Risk
RIDI	25	There is a risk that as a result of increased intense rainfall events Councils urban drainage infrastructure may exceed capacity with greater frequency	Likely	Moderate	High
RIEI	26	There is a risk that as a result of increased intense rainfall events Councils urban drainage infrastructure may exceed capacity with greater frequency	Likely	Moderate	High
RIAW	27	There is a risk that as a result of increased frequency and intensity of severe rainfall events, Councils sewerage infrastructure may become inundated and exceeds capacity due to inflow and infiltration of stormwater	Likely	Moderate	High
RICW	28	There is a risk that as a result of increased frequency and intensity of severe rainfall events, Councils sewerage infrastructure may become inundated and exceeds capacity due to inflow and infiltration of stormwater	Likely	Moderate	High
RIDW	29	There is a risk that as a result of increased frequency and intensity of severe rainfall events, Councils sewerage infrastructure may become inundated and exceeds capacity due to inflow and infiltration of stormwater	Likely	Moderate	High
RIEW	30	There is a risk that as a result of increased frequency and intensity of severe rainfall events, Councils sewerage infrastructure may become inundated and exceeds capacity due to inflow and infiltration of stormwater	Likely	Moderate	High
RIDN	31	There is a risk that as a result of increased frequency and intensity of extreme rainfall events, creek and river systems may be subject to greater erosion causing greater carriage of pollutants i.e. chemicals, sediments, organics and gross pollutants	Likely	Moderate	High
RIEI	32	There is a risk that as a result of increased frequency and intensity of extreme rainfall events, creek and river systems may be subject to greater erosion causing greater carriage of pollutants i.e. chemicals, sediments, organics and gross pollutants	Likely	Moderate	High

End of Report

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WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Insight Report

The Global Risks Report 2019
14th Edition

In partnership with Marsh & McLennan Companies and Zurich Insurance Group

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Figure I: The Global Risks Landscape 2019

Source: World Economic Forum Global Risks Perception Survey 2018–2019.
Note: Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 5, 1 representing a risk that is very unlikely to happen and 5 a risk that is very likely to occur. They also assess the impact on each global risk on a scale of 1 to 5 (1: minimal impact, 2: minor impact, 3: moderate impact, 4: severe impact and 5: catastrophic impact). See Appendix B for more details. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

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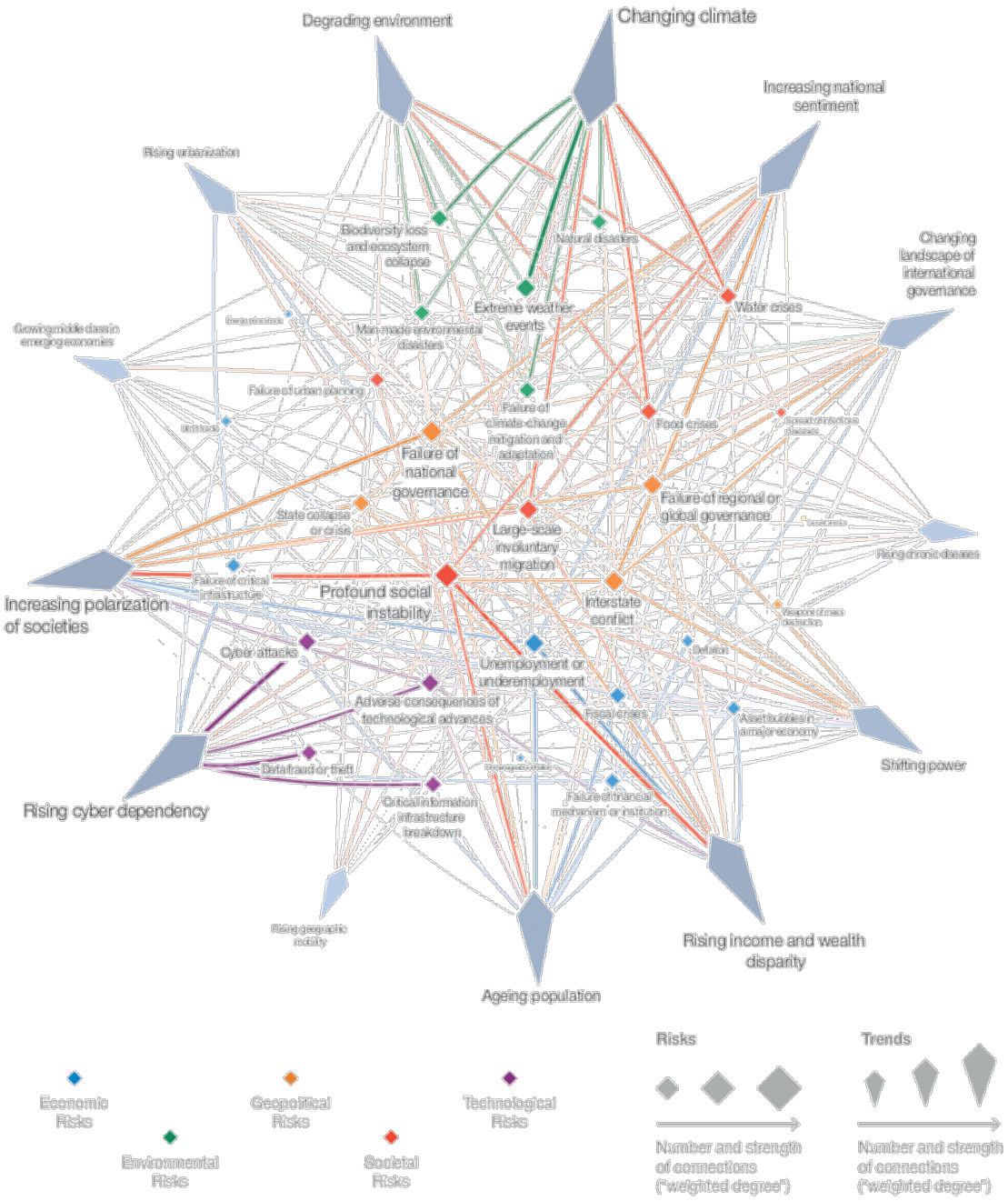
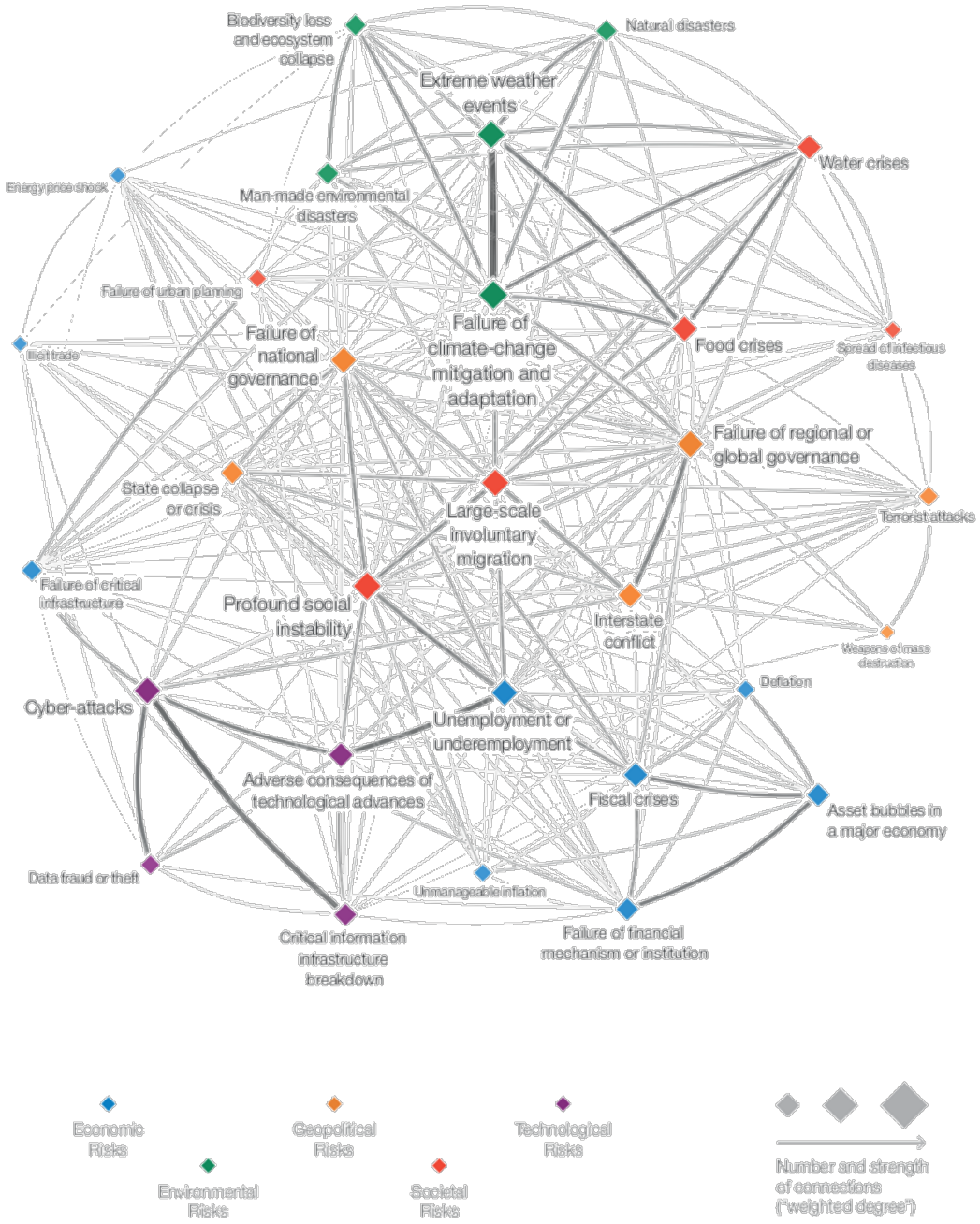
Figure II: The Risks-Trends Interconnections Map 2019



Source: World Economic Forum Global Risks Perception Survey 2018–2019.
Note: Survey respondents were asked to select the three trends that are the most important in shaping global development in the next 10 years. For each of the three trends identified, respondents were asked to select the risks that are most strongly driven by those trends. See Appendix B for more details. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

Figure III: The Global Risks Interconnections Map 2019



Source: World Economic Forum Global Risks Perception Survey 2018–2019.
Note: Survey respondents were asked to select up to six pairs of global risks they believe to be most interconnected. See Appendix B for more details. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

Figure IV: The Evolving Risks Landscape, 2009 – 2019

Top 5 Global Risks in Terms of Likelihood

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1st	Asset price collapse	Asset price collapse	Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity	Interstate conflict with regional consequences	Large-scale involuntary migration	Extreme weather events	Extreme weather events	Extreme weather events
2nd	Slowing Chinese economy (<6%)	Slowing Chinese economy (<6%)	Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events	Extreme weather events	Extreme weather events	Large-scale involuntary migration	Natural disasters	Failure of climate-change mitigation and adaptation
3rd	Chronic disease	Chronic disease	Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment	Failure of national governance	Failure of climate-change mitigation and adaptation	Major natural disasters	Cyber-attacks	Natural disasters
4th	Global governance gaps	Fiscal crises	Biodiversity loss	Cyber-attacks	Water supply crises	Climate change	State collapse or crisis	Interstate conflict with regional consequences	Large-scale terrorist attacks	Data fraud or theft	Data fraud or theft
5th	Retrenchment from globalization	Global governance gaps	Climate change	Water supply crises	Mismanagement of population	Cyber-attacks	High structural unemployment or underemployment	Major natural catastrophes	Massive incident of data fraud/theft	Failure of climate-change mitigation and adaptation	Cyber-attacks

Top 5 Global Risks in Terms of Impact

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1st	Asset price collapse	Asset price collapse	Fiscal crises	Major systemic financial failure	Major systemic financial failure	Fiscal crises	Water crises	Failure of climate-change mitigation and adaptation	Weapons of mass destruction	Weapons of mass destruction	Weapons of mass destruction
2nd	Retrenchment from globalization (developed)	Retrenchment from globalization (developed)	Climate change	Water supply crises	Water supply crises	Climate change	Rapid and massive spread of infectious diseases	Weapons of mass destruction	Extreme weather events	Extreme weather events	Failure of climate-change mitigation and adaptation
3rd	Oil and gas price spike	Oil price spikes	Geopolitical conflict	Food shortage crises	Chronic fiscal imbalances	Water crises	Weapons of mass destruction	Water crises	Water crises	Natural disasters	Extreme weather events
4th	Chronic disease	Chronic disease	Asset price collapse	Chronic fiscal imbalances	Diffusion of weapons of mass destruction	Unemployment and underemployment	Interstate conflict with regional consequences	Large-scale involuntary migration	Major natural disasters	Failure of climate-change mitigation and adaptation	Water crises
5th	Fiscal crises	Fiscal crises	Extreme energy price volatility	Extreme volatility in energy and agriculture prices	Failure of climate-change mitigation and adaptation	Critical information infrastructure breakdown	Failure of climate-change mitigation and adaptation	Severe energy price shock	Failure of climate-change mitigation and adaptation	Water crises	Natural disasters

Economic | Environmental | Geopolitical | Societal | Technological

Source: World Economic Forum 2009–2019, Global Risks Reports.
Note: Global risks may not be strictly comparable across years, as definitions and the set of global risks have evolved with new issues emerging on the 10-year horizon. For example, cyberattacks, income disparity and unemployment entered the set of global risks in 2012. Some global risks were reclassified: water crises and rising income disparity were re-categorized first as societal risks and then as a trend in the 2015 and 2016 *Global Risks Reports*, respectively.

The Global Risks Report 2019
14th Edition

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Preface

Børge Brende
President
World Economic Forum

We publish the 2019 edition of the World Economic Forum's *Global Risks Report* at an important moment. The world is facing a growing number of complex and interconnected challenges—from slowing global growth and persistent economic inequality to climate change, geopolitical tensions and the accelerating pace of the Fourth Industrial Revolution. In isolation, these are daunting challenges; faced simultaneously, we will struggle if we do not work together. There has never been a more pressing need for a collaborative and multistakeholder approach to shared global problems.

This is a globalized world, as a result of which historic reductions in global poverty have been achieved. But it is also increasingly clear that change is needed. Polarization is on the rise in many countries. In some cases, the social contracts that hold societies together are fraying. This is an era of unparalleled resources and technological advancement, but for too many people it is also an era of insecurity. We are going to need new ways of doing globalization that respond to this insecurity. In some areas, this may mean redoubling efforts at the international level—implementing new approaches to a range of issues: technology and climate change to trade, taxation, migration and humanitarianism. In other areas renewed commitment and resources will be needed at the national level—tackling inequality, for example, or strengthening social protections and the bonds of political community.

Renewing and improving the architecture of our national and international political and economic systems is this generation's defining task. It will be a monumental undertaking, but an indispensable one. The *Global Risks Report* demonstrates how high the stakes are—my hope is that this year's report will also help to build momentum behind the need to act. It begins with a sweep of the global risks landscape and warns of the danger of sleepwalking into crises. It goes on to consider a number of risks in depth: geopolitical and geo-economic disruptions, rising sea levels, emerging biological threats, and the increasing emotional and psychological strain that many people are experiencing. The Future Shocks section again focuses on potential rapid and dramatic changes in the systems we rely on—topics this year include quantum computing, human rights and economic populism.

The *Global Risks Report* embodies the collaborative and multistakeholder ethos of the World Economic Forum. It sits at the heart of our new Centre for Regional and Geopolitical Affairs, which is responsible for our crucial partnerships with the world's governments and international organizations. But the breadth and depth of its analysis also hinge on constant interaction with the Forum's industry and thematic teams, which shape our systems-based approach to the challenges facing the world. I am grateful for the collaboration of so many colleagues in this endeavour.

I am also particularly grateful for the insight and dedication of the report's Advisory Board. I would like to thank our long-standing strategic partners, Marsh & McLennan Companies and Zurich Insurance Group, as well as our academic advisers at the National University of Singapore, the Oxford Martin School at the University of Oxford and the Wharton Risk Management and Decision Processes Center at the University of Pennsylvania. As in previous years, the *Global Risks Report* draws on our annual Global Risks Perceptions Survey, which is completed by around 1,000 members of our multistakeholder communities. The report has also benefitted greatly from the input of many individuals in the Forum's global expert networks.

Executive Summary

Is the world sleepwalking into a crisis? Global risks are intensifying but the collective will to tackle them appears to be lacking. Instead, divisions are hardening. The world's move into a new phase of strongly state-centred politics, noted in last year's *Global Risks Report*, continued throughout 2018. The idea of "taking back control"—whether domestically from political rivals or externally from multilateral or supranational organizations—resonates across many countries and many issues. The energy now expended on consolidating or recovering national control risks weakening collective responses to emerging global challenges. We are drifting deeper into global problems from which we will struggle to extricate ourselves.

During 2018, **macroeconomic risks** moved into sharper focus. Financial market volatility increased and the headwinds facing the global economy intensified. The rate of global growth appears to have peaked: the latest International Monetary Fund (IMF) forecasts point to a gradual slowdown over the next few years.[1] This is mainly the result of developments in advanced economies, but projections of a slowdown in China—from 6.6% growth in 2018 to 6.2% this year and 5.8% by 2022—are a source of concern. So too is the global debt burden, which is significantly higher than before the global financial crisis, at around 225% of GDP. In addition, a tightening of global financial conditions has placed particular strain on countries that built up dollar-denominated liabilities while interest rates were low.

Geopolitical and geo-economic tensions are rising among the world's major powers. These tensions represent the most urgent global risks at present. The world is evolving into a period of divergence following a period of globalization that profoundly altered the global political economy. Reconfiguring the relations of deeply integrated countries is fraught with potential risks, and trade and investment relations among many of the world's powers were difficult during 2018. Against this backdrop, it is likely to become more difficult to make collective progress on other global challenges—from protecting the environment to responding to the ethical challenges of the Fourth Industrial Revolution. Deepening fissures in the international system suggest that systemic risks may be building. If another global crisis were to hit, would the necessary levels of cooperation and support be forthcoming? Probably, but the tension between the globalization of the world economy and the growing nationalism of world politics is a deepening risk.

Environmental risks continue to dominate the results of our annual Global Risks Perception Survey (GRPS). This year, they accounted for three of the top five risks by likelihood and four by impact. Extreme weather was the risk of greatest concern, but our survey respondents are increasingly worried about environmental policy failure: having fallen in the rankings after Paris, "failure of climate-change mitigation and adaptation" jumped back to number two in terms of impact this year. The results of climate inaction are becoming increasingly clear. The accelerating pace of biodiversity loss is a particular concern. Species abundance is down by 60% since 1970. In the human food chain, biodiversity loss is affecting health and socioeconomic development, with implications for well-being, productivity, and even regional security.

[1] International Monetary Fund (IMF). 2018. *World Economic Outlook, October 2018: Challenges to Steady Growth*. Washington, DC: IMF. https://www.imf.org/en/publications/weo

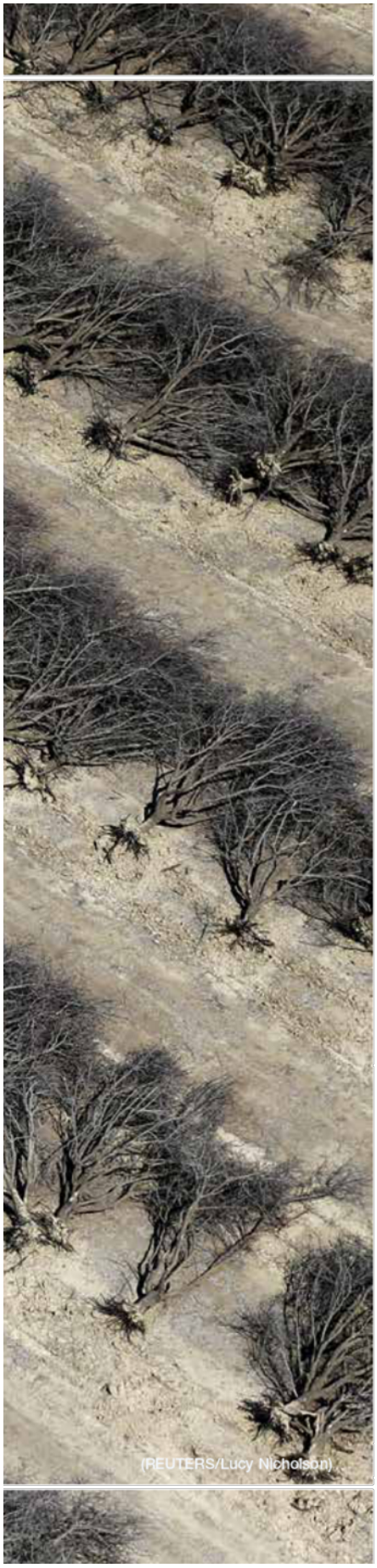
Technology continues to play a profound role in shaping the global risks landscape. Concerns about data fraud and cyber-attacks were prominent again in the GRPS, which also highlighted a number of other **technological vulnerabilities**: around two-thirds of respondents expect the risks associated with fake news and identity theft to increase in 2019, while three-fifths said the same about loss of privacy to companies and governments. There were further massive data breaches in 2018, new hardware weaknesses were revealed, and research pointed to the potential uses of artificial intelligence to engineer more potent cyber-attacks. Last year also provided further evidence that cyber-attacks pose risks to critical infrastructure, prompting countries to strengthen their screening of cross-border partnerships on national security grounds.

The importance of the various structural changes that are under way should not distract us from **the human side of global risks**. For many people, this is an increasingly anxious, unhappy and lonely world. Worldwide, mental health problems now affect an estimated 700 million people. Complex transformations—societal, technological and work-related—are having a profound impact on people's lived experiences. A common theme is psychological stress related to a feeling of lack of control in the face of uncertainty. These issues deserve more attention: declining psychological and emotional well-being is a risk in itself—and one that also affects the wider global risks landscape, notably via impacts on social cohesion and politics.

Another set of risks being amplified by global transformations relate to biological pathogens. Changes in how we live have increased the risk of a devastating outbreak occurring naturally, and emerging technologies are making it increasingly easy for new **biological threats** to be manufactured and released either deliberately or by accident. The world is badly under-prepared for even modest biological threats, leaving us vulnerable to potentially huge impacts on individual lives, societal well-being, economic activity and national security. Revolutionary new biotechnologies promise miraculous advances, but also create daunting challenges of oversight and control—as demonstrated by claims in 2018 that the world's first gene-modified babies had been created.

Rapidly growing cities and ongoing effects of climate change are making more people vulnerable to **rising sea levels**. Two-thirds of the global population is expected to live in cities by 2050 and already an estimated 800 million people live in more than 570 coastal cities vulnerable to a sea-level rise of 0.5 metres by 2050. In a vicious circle, urbanization not only concentrates people and property in areas of potential damage and disruption, it also exacerbates those risks—for example by destroying natural sources of resilience such as coastal mangroves and increasing the strain on groundwater reserves. Intensifying impacts will render an increasing amount of land uninhabitable. There are three main strategies for adapting to rising sea-levels: (1) engineering projects to keep water out, (2) nature-based defences, and (3) people-based strategies, such as moving households and businesses to safer ground or investing in social capital to make flood-risk communities more resilient.

In this year's **Future Shocks** section, we focus again on the potential for threshold effects that could trigger dramatic deteriorations and cause cascading risks to crystallize with dizzying speed. Each of the 10 shocks we present is a "what-if" scenario—not a prediction, but a reminder of the need to think creatively about risk and to expect the unexpected. Among the topics covered this year are quantum cryptography, monetary populism, affective computing and the death of human rights. In the **Risk Reassessment** section, experts share their insights about how to manage risks. John Graham writes about weighing the trade-offs between different risks, and András Tilcsik and Chris Clearfield write about how managers can minimize the risk of systemic failures in their organizations. And in the **Hindsight** section, we revisit three of the topics covered in previous reports: food security, civil society and infrastructure investment.


(REUTERS/Lucy Nicholson)

2019 Global Risks

Out of control

Is the world sleepwalking into a crisis? Global risks are intensifying but the collective will to tackle them appears to be lacking. Instead, divisions are hardening. The world's move into a new phase of state-centred politics, noted in last year's *Global Risks Report*, continued throughout 2018. The idea of "taking back control"—whether domestically from political rivals or externally from multilateral or supranational organizations—resonates across many countries and many issues. The energy now being expended on consolidating or recovering national control risks weakening collective responses to emerging global challenges. We are drifting deeper into global problems from which we will struggle to extricate ourselves.

The following sections focus on five areas of concern highlighted in this year's Global Risks Perception Survey (GRPS), which frame much of the analysis in subsequent chapters: (1) economic vulnerabilities, (2) geopolitical tensions, (3) societal and political strains, (4) environmental fragilities, and (5) technological instabilities.

Economic worries

Geo-economic tensions ratcheted up during 2018, as discussed in Chapter 2 (Power and Values). GRPS respondents were concerned in the short term about the deteriorating international economic environment, with the vast majority expecting increasing risks in 2019 related to "economic confrontations between major powers" (91%) and "erosion of multilateral trading rules and agreements" (88%).

Last year's report advised caution about broader macroeconomic fragilities, even at a time of strengthening growth. Economic risks have since moved into sharper focus. Financial market volatility increased in 2018, and the headwinds facing the global economy intensified. The rate of global growth appears to have peaked: the latest International Monetary Fund (IMF) forecasts point to a gradual slowdown over the next few years.[1] This is mainly the result of developments in advanced economies, where the IMF expects real GDP growth to decelerate from 2.4% in 2018 to 2.1% this year and to 1.5% by 2022. However, while developing economies' aggregate growth is expected to remain broadly unchanged, projections of a slowdown in China—from 6.6% in 2018 to 6.2% this year and 5.8% by 2022—are a source of concern.

High levels of global indebtedness were one of the specific financial vulnerabilities we highlighted last year. These concerns have not eased. The total global debt burden is now significantly higher than it was before the global financial crisis, at around 225% of GDP.[2] In its latest *Global Financial Stability Report*, the IMF notes that in countries with systemically significant financial sectors, the debt burden is higher still, at 250% of GDP—this compares with a figure of 210% in 2008.[3] In addition, a tightening of global financial conditions has placed particular strain on countries that built up dollar-denominated liabilities while interest rates were low. By October last year, more than 45% of low-income countries were in or at high risk of debt distress, up from one-third in 2016.[4]

Inequality continues to be seen as an important driver of the global risks landscape. "Rising income and wealth disparity" ranked fourth in GRPS respondents' list of underlying trends. Although global inequality has dipped this millennium, within-country inequality has continued to rise. New research published last year attributes economic inequality largely to widening divergences between public and private levels of capital ownership over the past 40 years: "Since 1980, very large transfers of public to private wealth occurred in nearly all countries, whether rich or emerging. While national wealth has substantially increased, public wealth is now negative or close to zero in rich countries";[5] (see Figure 1.1).

Coupled with political polarization, inequality erodes a country's social fabric in an economically damaging way: as cohesion and trust diminish, economic performance is likely to follow.[6] One study attempts to quantify by how much various countries' per capita income would hypothetically increase if their levels of trust were as high as they are in Sweden.[7] Even in richer developed countries, the estimated gains

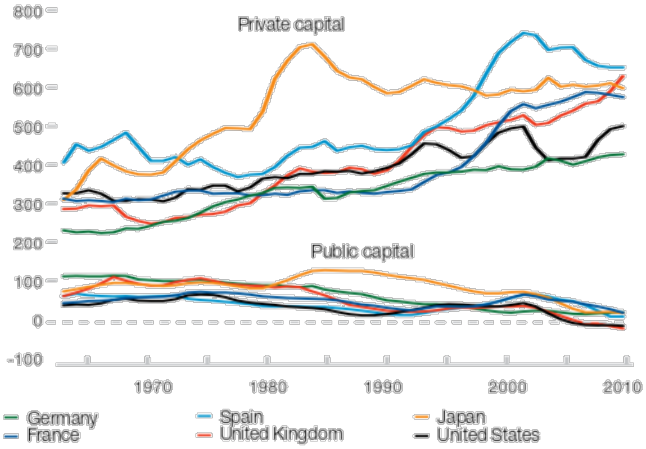

(REUTERS/Damir Sagolj)

would be significant, ranging from 6% in the United Kingdom to 17% in Italy. In some other countries they are much greater: 29% in the Czech Republic, 59% in Mexico and 69% in Russia. Given these results, it is sobering that the 2018 Edelman Trust Barometer categorizes 20 of the 28 countries surveyed as "distrusters".[8] Beyond economic impacts, eroding trust is part of a wider pattern that threatens to corrode the social contract in many countries. This is an era of strong-state politics, but also one of weakening national communities.

Interest is increasing in approaches to economics and finance that draw on moral theory and social psychology to reconcile individual and communitarian goals. For example, more attention is being paid to economist and philosopher Adam Smith and to placing his work on the "invisible hand" of market capitalism in the context of his ideas on moral obligation and community. Some argue that too much emphasis has been placed on "the 'wants' of *The Wealth of Nations*" over "the 'oughts' of *The Theory of Moral Sentiments*."[9] There are no easy remedies: the moral psychology of partisan differences is not conducive to compromise on values,[10] while the geopolitical divergences discussed in Chapter 2 (Power and Values) will complicate any attempt to find consensus on bold attempts to rethink global capitalism. However, that is the new challenge, and it is one to which the World Economic Forum will devote itself at its Annual Meeting 2019 in Davos.

Figure 1.1: Private Gains

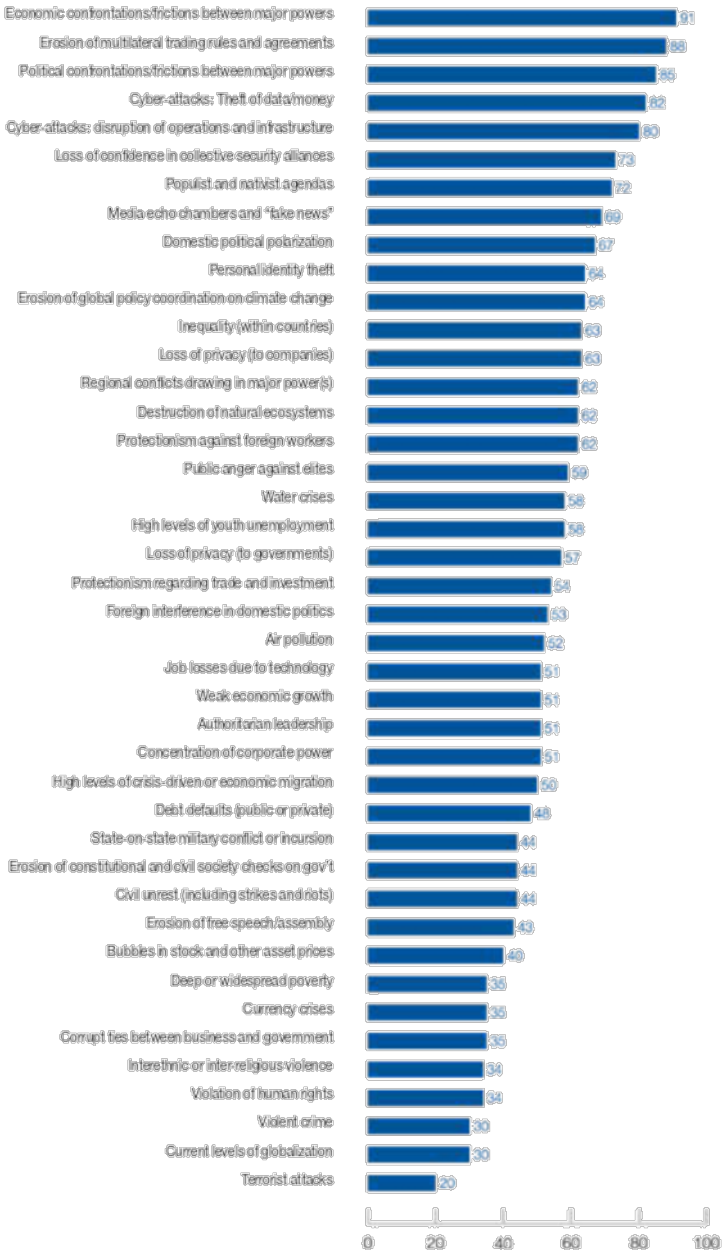
Net private and public wealth 1970–2015 (% of national income)



Source: World Inequality Database, https://wir2018.wid.world

Figure 1.2: Short-Term Risk Outlook

Percentage of respondents expecting risks to increase in 2019



Source: World Economic Forum Global Risks Perception Survey 2018–2019.
Note: For details of the question respondents were asked, see Appendix B.

Major-power tensions

Last year saw rising geopolitical tensions among the world's major powers. These mostly played out in the economic field, as discussed in Chapter 2 (Power and Values), but more fundamental spillovers are possible. The respondents to this year's GRPS are pessimistic: 85% said they expect 2019 to involve increased risks of "political confrontations between major powers" (see Figure 1.2).

Polarization and weak governance raise serious questions about many countries' political health

The evolving China-US relationship is part of the emerging geopolitical landscape described in last year's *Global Risks Report* as "multipolar and multiconceptual". In other words, the instabilities that are developing reflect not just changing power balances, but also the fact that post-Cold War assumptions—particularly in the West—that the

world would converge on Western norms have been shown to be naïvely optimistic. As Chapter 2 (Power and Values) discusses, differences in fundamental norms are likely to play an important role in geopolitical developments in the years and decades ahead. These differences will affect the global risks landscape in significant ways—from weakening security alliances to undermining efforts to protect the global commons.

With multilateralism weakening and relations between the world's major powers in flux, the current geopolitical backdrop is inauspicious for resolving the many protracted conflicts that persist around the world. In Afghanistan, for example, civilian deaths in the first six months of 2018 were the highest in 10 years, according to the UN, while the share of districts controlled by the United States–supported Afghan government fell from 72% in 2015 to 56% in 2018.[11] In Syria, multiple states are now embroiled in a civil conflict in which hundreds of thousands have died. And in Yemen, the direct casualties of war are estimated at 10,000 and as many as 13 million people are at risk of starvation as a result of disruptions to food and other supplies, according to a UN warning in October 2018.[12]

One positive geopolitical development since the last edition of this report has been an easing of tensions and volatility related to North Korea's nuclear programme, following increased diplomacy involving the United States, South Korea and North Korea. This may have played a part in a sharp fall—from 79% to 44%—in the proportion of the survey respondents expecting the risk of "state-on-state military conflict or incursion" to increase over the next year. Nonetheless, for the third year running, weapons of mass destruction ranked as the number one global risk in terms of potential impact.

Political strains

Around the world, mounting geopolitical instabilities are matched—and frequently exacerbated—by continuing domestic political strains. GRPS respondents ranked "increasing polarization of societies" second only to climate change as an underlying driver of developments in the global risks landscape. Many Western democracies are still struggling with post-crisis patterns of political fragmentation and polarization that have complicated the process of providing stable and effective governance. But this is a global issue, not just a "first-world problem". In the World Economic Forum's inaugural *Regional Risks for Doing Business* report, published last year, "failure of national governance" ranked second globally and first in Latin America and South Asia, based on a survey of around 12,000 business leaders covering more than 130 countries.[13]

Polarization and weak governance raise serious questions about numerous countries' political health. In many cases, partisan differences are deeper than they have been for a long time. A vicious circle may develop in which diminishing social cohesion places ever-greater strain on political institutions, undermining their ability to anticipate or respond to societal challenges. This problem is even more acute when global challenges require multilateral cooperation or integration: weaker levels of legitimacy and accountability invite an anti-elitist backlash. So too do failures of multilateral policy and institutional design. For example, it is now widely acknowledged that more should have been done to provide protection or remedies to the losers from globalization.[14] It should not have taken a crisis to recognize this. In the GRPS, 59% of respondents said they expect risks associated with "public anger against elites" to increase in 2019.

85%

respondents expecting major-power political confrontations

Chapter 3 (Heads and Hearts) looks at the causes and potential consequences of rising levels of anger, along with other forms of emotional and psychological distress.

Identity politics continue to drive global social and political trends, and immigration and asylum policy raise fundamental questions about control over the composition of political communities. Migration has triggered political disruption in recent years, ranging from Asia and Latin America to Europe and the United States. Global trends—from demographic projections to climate change—practically guarantee further crises, and some leaders are likely to take a tougher line in defence of dominant national cultures. In the GRPS, 72% of respondents said they expect risks associated with "populist and nativist agendas" to increase in 2019.

In some countries, efforts to secure recognition and equality for a widening range of minority social groups—defined by characteristics such as race, ethnicity, religion, gender identity or sexual orientation—have become increasingly electorally significant. In the United States, for example, attitudes towards identity politics mark increasingly bitter divisions between Republican and Democratic voting blocs.[15] November 2018's mid-term Congressional elections saw a record number of women and non-white candidates elected.

There has been a period of renewed politicization around gender, sexism and sexual assault in the United States. The #MeToo movement, which began in October 2017, continued in 2018 and has also drawn attention to—and in some cases amplified—similar campaigns against sexual violence.[16] The increased attention being paid globally to violence against women was also reflected in the Nobel Peace Prize going to Nadia Murad and Denis Mukwege for their work to end the use of sexual violence as a tool of conflict. Beyond being directly targeted with violence and discrimination, women around the world are also disproportionately affected by many of the risks discussed in the *Global Risks Report*, often as a result of experiencing higher levels of poverty and being the primary providers of childcare, food and fuel. For example, climate change means women in many communities must walk farther to fetch water. Women often do not have the same freedom or resourcesas men to reach safety after natural disasters—in parts of Sri Lanka, Indonesia and India, men who survived the 2004 tsunami outnumbered women by almost three to one.[17] According to the International Monetary Fund (IMF),

(REUTERS/Yannis Behrakis)

women are also more likely than men to have their jobs displaced by automation.[18]

Climate catastrophe

Environment-related risks dominate the GRPS for the third year in a row, accounting for three of the top five risks by likelihood and four by impact (see Figure IV). Extreme weather is again out on its own in the top-right (high-likelihood, high-impact) quadrant of the Global Risks Landscape 2019 (see Figure I).

Environment-related risks account for three of the top five risks by likelihood and four by impact

The year 2018 was another one of storms, fires and floods.[19] Of all risks, it is in relation to the environment that the world is most clearly sleepwalking into catastrophe. The Intergovernmental Panel on Climate Change (IPCC) bluntly said in October 2018 that we have at most 12 years to make the drastic and unprecedented changes needed to prevent average global temperatures from rising beyond the Paris Agreement's 1.5°C target. In the United States, the Fourth National Climate Assessment warned in November that without significant reductions in emissions, average global temperatures could rise by 5°C by the end of the century.[20] GRPS respondents seem increasingly worried about environmental policy failure: having fallen in the rankings after Paris, "failure of climate-change mitigation and adaptation" jumped back to number two in terms of impact this year. And the most frequently cited risk interconnection was the pairing of "failure of climate-change mitigation and adaptation" and "extreme weather events".

The accelerating pace of biodiversity loss is a particular concern. The Living Planet Index, which tracks more than 4,000 species across the globe, reports a 60% decline in average abundance since 1970.[21] Climate change is exacerbating biodiversity loss and the causality goes both ways: many affected ecosystems—such as oceans and forests—are important for absorbing carbon emissions. Increasingly fragile ecosystems also pose risks to societal and economic stability. For example, 200 million people depend on coastal mangrove ecosystems to protect their livelihoods and food security from storm surges and rising sea levels, as discussed in Chapter 5 (Fight or Flight).[22] One estimate of the notional economic value of "ecosystem services"—benefits to humans, such as drinking water, pollination or protection against floods—puts it at US$125 trillion per year, around two-thirds higher than global GDP.[23]

In the human food chain, loss of biodiversity affects health and socio-economic development, with implications for well-being, productivity and even regional security. Micronutrient malnutrition affects as many as 2 billion people. It is typically caused by a lack of access to food of sufficient variety and quality.[24] Nearly half the world's plant-based calories are provided by just three crops: rice, wheat and maize.[25] Climate change compounds the risks. In 2017, climate-related disasters caused acute food insecurity for approximately 39 million people across 23 countries.[26] Less obviously, increased levels of carbon dioxide in the atmosphere are affecting the nutritional composition of staples such as rice and wheat. Research suggests that by 2050 this could lead to zinc deficiencies for 175 million people, protein deficiencies for 122 million, and loss of dietary iron for 1 billion.[27]

As environmental risks crystallize with increasing frequency and severity, the impact on global value chains is likely to intensify, weakening overall resilience. Disruptions to the production and delivery of goods and services due to environmental disasters are up by 29% since 2012.[28] North America was the region worst affected by environment-related supply-chain disruptions in 2017; these disruptions were due notably to hurricanes and wildfires.[29] For example, in the US automotive industry, only factory fires and company mergers caused more supply-chain disruptions than hurricanes.[30] When the disruptions are measured by the number of suppliers affected rather than the number of individual events, the four most significant triggers in 2017 were hurricanes, extreme weather, earthquakes and floods.[31]

Upheavals in the global waste disposal and recycling supply chain during 2018 may be a foretaste. China banned the import of foreign waste, including almost 9 million tons of plastic scrap, to reduce pollution and strain on its national environmental systems.[32] This ban exposed weaknesses in the domestic recycling capacity of many Western countries. Plastic waste built up in the United Kingdom, Canada and several European states. In the first half of 2018 the United States sent 30% of the plastic that would previously have gone to China to landfill,[33] and the rest to other countries including Thailand, Malaysia and Vietnam. However, all three of those countries have since announced their own new restrictions or bans on plastic imports. In sum, as the impact of environmental risks increases, it will become increasingly difficult to treat those risks as externalities that can be ignored or shipped out. Domestic and coordinated international action will be needed to internalize and mitigate the impact of human activity on natural systems.

Technological instabilities

Technology continues to play a profound role in shaping the global risks landscape for individuals, governments and businesses. In the GRPS, "massive data fraud and theft" was ranked the number four global risk by likelihood over a 10-year horizon, with "cyber-attacks" at number five. This sustains a pattern recorded last year, with cyber-risks consolidating their position alongside environmental risks in the high-impact, high-likelihood quadrant of the Global Risks Landscape (Figure I). A large majority of respondents expected increased risks in 2019 of cyber-attacks leading to theft of money and data (82%) and disruption of operations (80%). The survey reflects how new instabilities are being caused by the deepening integration of digital technologies into every aspect of life. Around two-thirds of respondents expect the risks associated with fake news and identity theft to increase in 2019, while three-fifths said the same about loss of privacy to companies and governments. The potential psychological effects of the increasing digital intermediation of people's lives is discussed in Chapter 3 (Heads and Hearts).

Malicious cyber-attacks and lax cybersecurity protocols again led to massive breaches of personal information in 2018. The largest was in India, where the government ID database, Aadhaar, reportedly suffered multiple breaches that potentially compromised the records of all 1.1 billion registered citizens. It was reported in January that criminals were selling access to the database at a rate of 500 rupees for 10 minutes, while in March a leak at a state-owned utility company allowed anyone to download names and ID numbers.[34] Elsewhere, personal data breaches affected around 150 million users of the MyFitnessPal application,[35] and around 50 million Facebook users.[36]

Cyber vulnerabilities can come from unexpected directions, as shown in 2018 by the Meltdown and Spectre threats, which involved weaknesses in computer hardware rather than software. They potentially affected every Intel processor produced in the last 10 years.[37] Last year also saw continuing evidence that cyber-

The vulnerability of critical technological infrastructure is a growing national security concern

attacks pose risks to critical infrastructure. In July the US government stated that hackers had gained access to the control rooms of US utility companies.[38] The potential vulnerability of critical technological infrastructure has increasingly become a national security concern. The second most frequently cited risk interconnection in this year's GPRS was the pairing of cyber-attacks with critical information infrastructure breakdown.

Machine learning or artificial intelligence (AI) is becoming more sophisticated and prevalent, with growing potential to amplify existing risks or create new ones, particularly as the Internet of Things connects billions of devices. In a survey conducted last year by Brookings, 32% of respondents said they view AI as a threat to humanity, while only 24% do not.[39] IBM last year revealed targeted AI malware that can "hide" a well-known threat—WannaCry—in a video-conferencing application, activating only when it recognizes the face of the intended target.[40] Similar innovations are likely to occur in other fields. For example, Chapter 4 (Going Viral) highlights the potential for malicious actors in synthetic biology to use AI to create new pathogens. One of this year's Future Shocks (Chapter 6) considers the potential consequences of "affective computing"—referring to AI that can recognize, respond to and manipulate human emotions.

Among the most widespread and disruptive impacts of AI in recent years has been its role in the rise of "media echo chambers and fake news", a risk that 69% of GRPS respondents expect to increase in 2019. Researchers last year studied the trajectories of 126,000 tweets and found that those containing fake news consistently outperformed those containing true information, on average reaching 1,500 people six times more quickly. One possible reason cited by researchers is that fake news tends to evoke potent emotions: "Fake tweets tended to elicit words associated with surprise and disgust, while accurate tweets summoned words associated with sadness and trust."[41] The interplay between emotions and technology is likely to become an ever more disruptive force.

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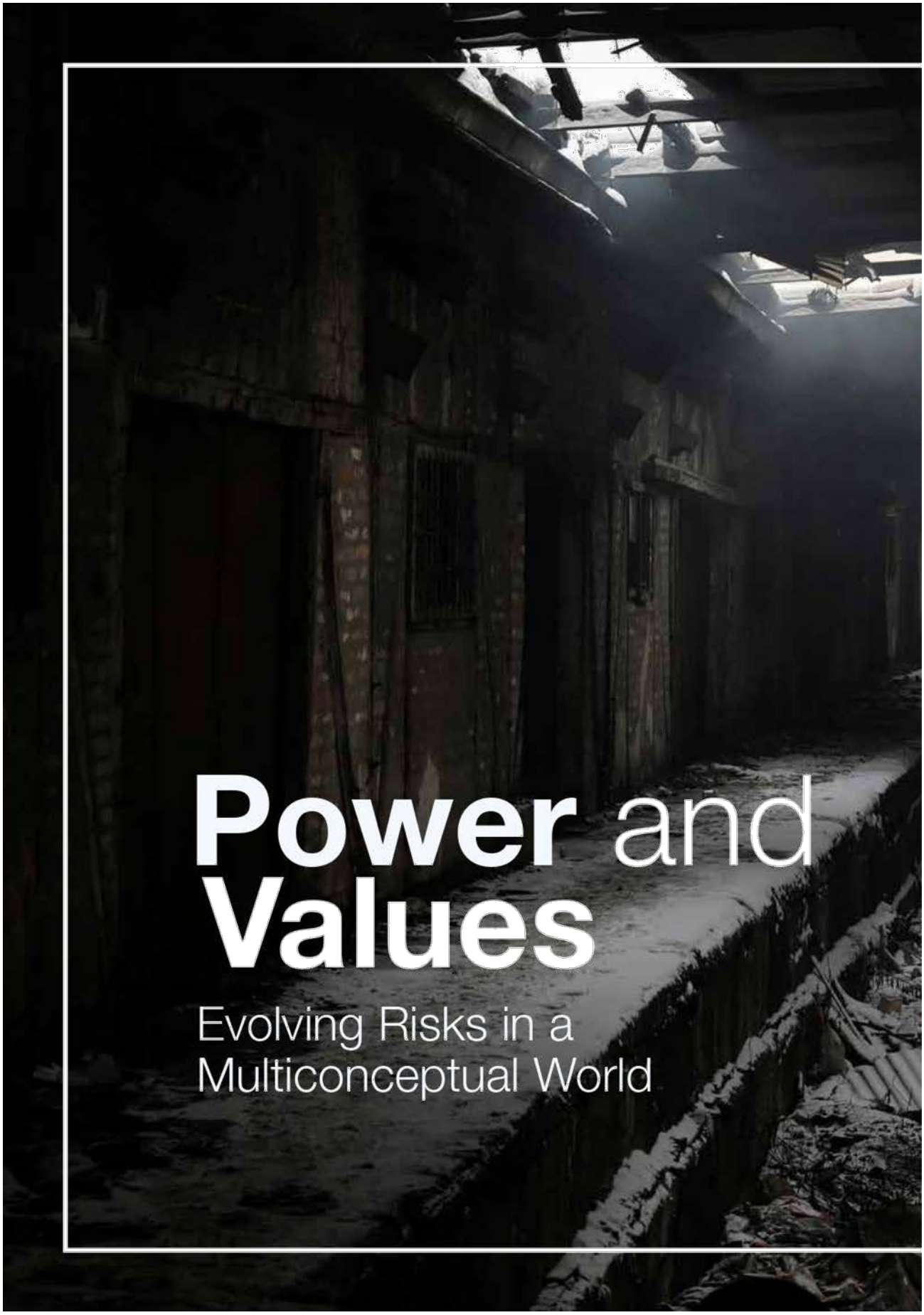
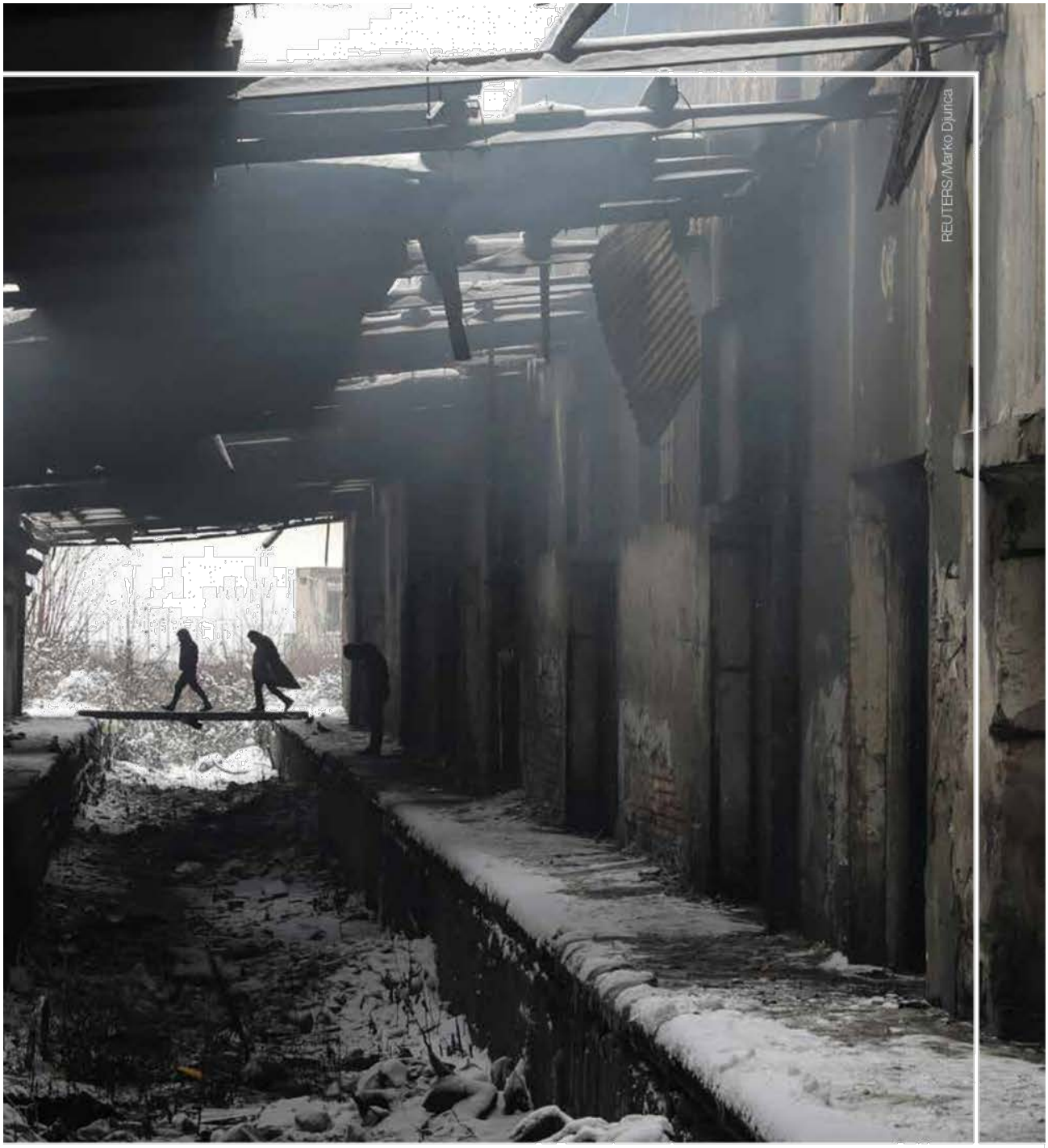

Power and Values
Evolving Risks in a Multiconceptual World


REUTERS/Marko Djurica

A period of change in the international system is destabilizing assumptions about global order. Last year's *Global Risks Report* argued that the world is becoming not just multipolar, but also "multiconceptual". This chapter further examines how changing power dynamics and diverging norms and values are affecting global politics and the global economy.

The chapter begins by outlining how normative differences increasingly shape domestic and international politics. It then highlights three trends with the potential to trigger disruptive change: (1) the difficulty of sustaining global consensus on ethically charged issues such as human rights; (2) intensifying pressure on multilateralism and dispute-settlement mechanisms; and (3) states' increasingly frequent use of geo-economic policy interventions.

No room for nostalgia

It should be no surprise that a multipolar world is also more multiconceptual: as global power is diffused, there is more room for divergent values to shape geopolitics than there has been since the end of World War II. After the bipolar Cold War gave way to unipolar US power, some argued that the battle of ideas was over and Western liberal democratic norms would, in time, prevail globally. That was a bold claim then and it looks like hubris now. In today's world, narratives of gradual convergence on any set of overarching values look unconvincing. Values seem to be a source of division rather than unity, not just globally but also within regions and countries.

Nostalgia is an inadequate response, especially as previous decades were hardly risk-free. The imperative now is to understand the changes that are happening and learn how to safely navigate the challenges they entail. After a period of globalization that has deeply integrated many countries, reconfiguring relationships is unlikely to be easy.

States, individuals and markets

Values-based tensions are manifesting in different ways in different places, creating new fault lines within and between countries and regions. But they have common features: control, and the role of the state. Many political leaders and communities feel they have lost control—whether to internal divisions, external rivals or multilateral organizations—and, in response, they look to strengthen the state. Because notions of power, security and self-determination are so politically fundamental, clashes may have less scope for compromise than when differences involve more technical issues.

Domestically, key tensions include the following:

- *States and individuals.* The balance has tilted from individuals towards states.[1] In this context, the idea of "illiberal democracy" has gained currency.[2]
- *States and minorities.* Politically, rising majoritarianism means voting is increasingly a winner-takes-all contest between polarized groupings. Culturally, identity politics have become increasingly contentious, with national majorities in many countries seeking greater assimilation (or exclusion) of minorities.
- *States and markets.* The scale and power of multinational businesses has fuelled growing opposition to globalization in many countries. Elsewhere, states are taking a stronger economic role: almost a quarter of the world's largest firms are now state-controlled, the highest level in decades.[3]


REUTERS/Jean-Paul Pelissier

- *The role of technology.* New technological capabilities have amplified existing tensions over values—for example, by weakening individual privacy or deepening polarization—while differences in values are shaping the pace and direction of technological advances in different countries.[4]

Globally, key pressures relate to how states interact and tackle cross-border challenges:

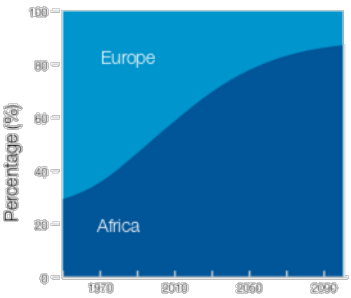
- *Multilateral rules and institutions.* Strong-state politics makes it harder to sustain multilateralism. As further explored below, this has been most evident so far in the shift in trade policy from global frameworks overseen by the World Trade Organization to state-led regional initiatives and bilateral deals.[5]

- *Sovereignty and non-interference.* The protections for state sovereignty in the UN Charter appear more resilient than the interventionist norms of the 2005 Responsibility to Protect principle. In the digital era, efforts to promote (or disrupt) political values in other countries have become increasingly contentious.

- *Migration and asylum.* The international movement of people has emerged in recent years as a fault-line issue in many countries. Demographic trends—such as those illustrated in Figure 2.1, which projects changes in the relative populations of Africa and Europe—will drive inter-regional migration in the decades ahead.

- *Protection of the global commons.* Climate change, outer space, cyber space and the polar regions are aspects of the global commons that are already or could increasingly become a source of international tensions.

Figure 2.1: Wave of Change
Relative shares of combined Europe/Africa population



Source: World Population Prospects 2017, https://population.un.org/wpp/

In the context of rising geopolitical competition and weakening multilateral institutions, debates revolving around these pressures have the potential to be destabilizing and even to foment conflict. A more hopeful prospect is that the current flux in the international system instead will lead in pragmatic, open and pluralist directions, but even then a difficult and risky transition lies ahead.

Shared goals amid divergent values

In a world of disparate powers and divergent values, it is likely to be more difficult to make progress on shared global goals. Such progress requires two things: aligning on substantive priorities for action, and then sustaining coordination and collaboration. The example of climate change shows that, even when the first is possible, the second can be challenging: broad consensus was built up over decades, culminating in the signing of the Paris Agreement in 2015—but evidence on implementation is mixed, and even full implementation will not be enough to prevent damaging levels of global warming.

Challenges related to the Fourth Industrial Revolution will evolve rapidly and coordinating a response may be complicated when they touch on fundamental values. Chapter 4 (Going Viral) discusses how emerging bio-technologies are blurring the lines between humanity and technology: for example, it was claimed in late 2018 that gene-editing tools had been used to create genetically modified babies. Whether countries each chart their own course on such research or instead align around shared ethical principles to craft international restrictions could have important implications for the future of humanity.

Migration and cross-border tax policy are among other global issues that are both ethically charged and subject to divergent state interests. However, the most acute challenge may be posed by human rights, which have become a litmus test for the changing role of values in the international system.

As geopolitical tensions and competition have intensified, human rights have been increasingly politicized.[6] The complex global picture that is emerging in that area—nominal alignment on shared values, marked differences in interpretation and implementation, fragmented approaches to multilateral institutions—is a microcosm of the wider role of values in the international system. An optimistic scenario sees the kind of flux that is evident around human rights as an opening for states and other stakeholders to find better ways of doing things. However, values divergence means that it will be difficult even to align on what "better" means in this context. As sketched out in one of our Future Shocks (see page 74), it is possible to imagine a tipping point is reached where states simply abandon ideas—and institutions—that limit their autonomy.

Multilateralism under threat

Political leaders have increasingly asserted the primacy of the nation-state in the international system and sought to weaken the constraints placed on national autonomy by international agreements and multilateral institutions. Defenders of multilateralism point out that this fragmentation risks creating blind spots, undermining global stability, and limiting the capacity to respond to cross-border challenges.

The current multilateral architecture has been criticized in rising and legacy powers alike. In some rising powers, critics argue that the international architecture is too firmly shaped by the post-World War II balance of power and values, and has failed to evolve to reflect subsequent global transformations.[7] In economic terms, for example, in 1950 the United States had 27.2% of global GDP and China 4.6% (on a purchasing power parity basis); in 2017 those figures were 15.3% and 18.2%, respectively.[8] Such shifts in the economic centre of gravity create demands for institutional change. Meanwhile, in some legacy powers, critics argue that multilateralism is a costly drag on their freedom to manoeuvre.

Multilateralism can be weakened in numerous ways. States can withdraw from agreements and institutions; they can intervene to block consensus; and they can adopt a selective approach to upholding norms and rules. Multilateral institutions can also experience a gradual process of disuse or disregard. Arguably, the cohesiveness of the multilateral

REUTERS/Edgar Su

Fragmentation risks creating blind spots, undermining global stability, and limiting the capacity to respond

system could be weakened by the creation of new parallel structures, but it is also possible that increased institutional density could bolster the resilience of the system.

International dispute resolution is an area of particular concern, so far manifesting especially in relation to trade. For example, if the appointment of new judges to the WTO's Appellate Body continues to be blocked, a key dispute-settlement panel could cease to function in December 2019, when there will no longer be enough judges on the panel to issue valid rulings.[9]

Dispute resolution is a crucial part of the architecture of international commerce, and the system is already changing—its centre of gravity is shifting from the West to Asia. For example, in late 2017 the China International Economic and Trade Arbitration Commission (CIETAC) introduced its first international arbitration rules, and in mid-2018 China established two new international courts to handle commercial disputes related to the Belt and Road Initiative.[10] Controversy has escalated in many countries over investor-state dispute settlement (ISDS) procedures, which allow foreign investors to rely on international arbitration processes rather than the local legal frameworks of countries in which they have invested.[11] If cross-border trust is eroded by geopolitical competition and diverging values, creating mutually accepted dispute-settlement mechanisms may become increasingly complicated.

Worsening trade relations

Trade is the arena in which the broader implications of a more multipolar, multiconceptual world have so far played out most clearly. Trade relations between China and the United States rapidly worsened during 2018. There were positive signs in the final months of the year, raising hopes that a normalization of relations will follow, but the pace of the earlier deterioration highlights how quickly risks can crystallize and intensify in this area.

The US Department of Commerce's strategic plan states that "economic security is national security"

In early 2018, on the recommendation of the US International Trade Commission,[12] President Trump announced "global safeguard tariffs"—the first time this provision had been used since 2001—totalling US$8.5 billion on solar panel imports and US$1.8 billion on washing machine imports. The United States later cited national security when imposing tariffs on steel and aluminium imports, and on three occasions it increased China-specific tariffs related to intellectual property and technology disputes.[13] These US steps drew counter-measures from China, and the stand-off soon threatened to cover all goods trade between the two countries.[14]

The potential costs of deepening trade tensions were highlighted in October 2018 when the International Monetary Fund (IMF) revised down its global growth projections for 2018 and 2019 by 0.2 percentage points. The IMF expects growth to slow in the United States from 2.9% last year to 2.4% in 2019, and in China from 6.6% to 6.2%. Any slowdown in global growth will add to the headwinds for developing countries, which already face rising interest rates and, in some cases, domestic political stresses as well: in September, as US bond yields picked up, investor nervousness had pushed emerging market equities into bear-market territory.[15]

Economic policy—long seen as a means of mitigating geopolitical risk by embedding powers in mutually beneficial relationships—is now frequently seen as a tool of strategic competition. For example, the US Department of Commerce's strategic plan for 2018–22 states that "economic security is national security."[16] Each side in the worsening stand-off between the United States and China last year blamed the other for eroding bilateral relations,[17 18] and domestic political factors have not always been conducive to compromise between the two countries. Their current relationship is such that a rapid unwinding of protectionist measures cannot be ruled out, but some analysts have warned about more fundamental challenges.

It was not only among rivals that global trade conditions worsened in 2018. US trade relations with its allies also saw unexpected volatility. Ahead of the meeting of G7 leaders in June, the United States imposed tariffs on steel and aluminium imports from the European Union, Canada, Mexico and others.[19] Threat and counter-threat followed, between the United States and the European Union in particular: President Trump talked of imposing a 20% tariff on vehicle imports from the European Union; the European Commission hinted at global countermeasures totalling US$294 billion, around one-fifth of total goods exports.[20] The uncertainty put strain on European car makers, some of which were already under pressure from US-China trade tensions.[21] In a rapprochement of sorts, President Trump and European Commission President Jean-Claude Juncker agreed in July to work towards reducing tariffs on both sides. And in October, a revised trade deal between the United States, Mexico and Canada was an-nounced to replace NAFTA: the


REUTERS/Yannis Behrakis

USMCA (the United States-Mexico-Canada Agreement).[22]

Almost all of the high-profile trade disruptions that were threatened or imposed in 2018 relate to exports and imports of physical goods. But a growing proportion of global trade consists of services—digital services in particular. As digital flows have increased in economic importance, so too have data localization provisions that require businesses to store data in the country where they are collected rather than on company servers located elsewhere.[23] Localization rules have been justified on numerous grounds, from privacy and intellectual property to national security, policing and tax. Critics argue, however, that governments' expressed reasons for restricting data flows are often a pretext for what amounts to protectionism designed to inhibit cross-border digital trade.[24]

Investment tensions

The past year's developments in foreign direct investment (FDI) are arguably even more significant than trade tensions. As discussed in the 2018 *Global Risks Report*, outward investment has become more associated with geopolitical positioning. As a result, caution towards inward investment is growing. Because FDI creates economic facts on the ground in a way that trade flows do not, this is an area where increasing geo-economic competition could sow seeds of tensions that take years to grow and years more to resolve. Western countries in particular have been sharpening their power to block investments in strategic sectors, particularly emerging technologies—raising the prospect of a partial unwinding of globalization in investment, as in trade.

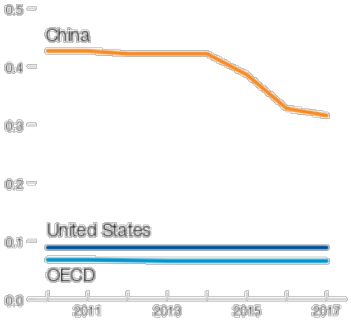
In August 2018 the German government announced a reduction in the threshold at which foreign investments can be blocked.[25] It had earlier instructed a state-owned bank to acquire a 20% stake in an energy infrastructure company to prevent its acquisition.[26] This is not the first time that a European government has sought to restrict inward investment. In 2005 France notoriously fended off PepsiCo's mooted acquisition of dairy producer Danone.[27] Then-Prime Minister Dominique de Villepin lauded "economic patriotism" as the foundation of global competitiveness.[28] That language prompted a backlash at the time, but it resonates today—though European wariness now focuses on Chinese rather than US takeovers.

This wariness has intensified since the cutting-edge German technology firm Kuka was acquired by a Chinese company in 2016. In 2018 the United Kingdom released a 120-page policy proposal that would increase government power to block foreign acquisitions,[29] while France published draft legislation increasing the number of sectors in which foreign acquisitions must receive prior ministerial approval.[30] Technology firms are a particular focus for investment screening because their significance goes beyond the economic: the dual-use nature of many new technologies means their acquisition could have national security implications.[31]

In December 2017 the European Commission proposed EU-wide measures to control non-EU investment into EU companies, as only 12 of the 28 member states have screening mechanisms. One reason for EU concern is that many decisions need member-state unanimity, creating vulnerability to foreign leverage in individual member states. In September 2018 European Commission President Jean-Claude Juncker called for more foreign-policy decisions in the European Union to be made by qualified majority voting instead.[32]

Figure 2.2: Opening Up?

OECD FDI Restrictiveness Index (0=open; 1=closed)



Source: Organisation for Economic Co-operation and Development (OECD). https://data.oecd.org/fdi/fdi-restrictiveness.htm

Note: The index covers four main types of FDI restriction: foreign equity restrictions, discriminatory screening or approval mechanisms, restrictions on key foreign personnel, and operational restrictions.

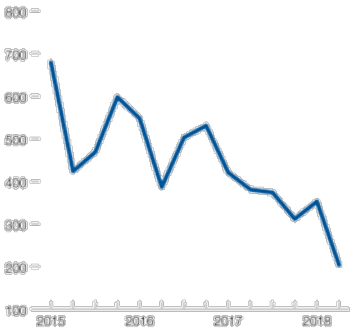
The United States also introduced legislation in 2018 to improve the screening of investment into 27 sectors, including semiconductors and telecommunications.[33] In 2017 India tightened the rules for foreign businesses operating in power transmission.[34] Australia has repeatedly tightened its inward investment rules in recent years, and in 2018 announced further restrictions on investment in electricity infrastructure and agricultural land.[35]

China is travelling in the other direction, albeit from a very different starting point. According to Organisation for Economic Co-operation and Development (OECD) data, China has significantly

reduced its restrictiveness to FDI in recent years, but nevertheless it remains among the world's most restrictive countries (see Figure 2.2).[36] While in 2018 China announced further cuts to its "negative list"—of sectors into which foreign businesses are prohibited from investing, or in which they can operate only as part of a joint venture with Chinese entities[37]—many sectors that would generate interest from foreign investors remain on the list.[38] As with trade, if the climate for cross-border investment flows

Figure 2.3: Going Down

Global FDI inward flows (US$ billions)



Source: Organisation for Economic Co-operation and Development (OECD). http://www.oecd.org/investment/statistics.htm

continues to worsen it will hamper global economic growth and risk creating a vicious circle in which economic and geopolitical tensions aggravate each other. The data already point to a sharp fall-off in FDI in 2017, despite other macroeconomic indicators being solid. This trend continued in the first half of 2018 (see Figure 2.3).[39]

If this were to be sustained, it would leave many states—particularly smaller or weaker ones—having to make painful choices between securing investment for growth and maintaining fiscal control and strategic independence.

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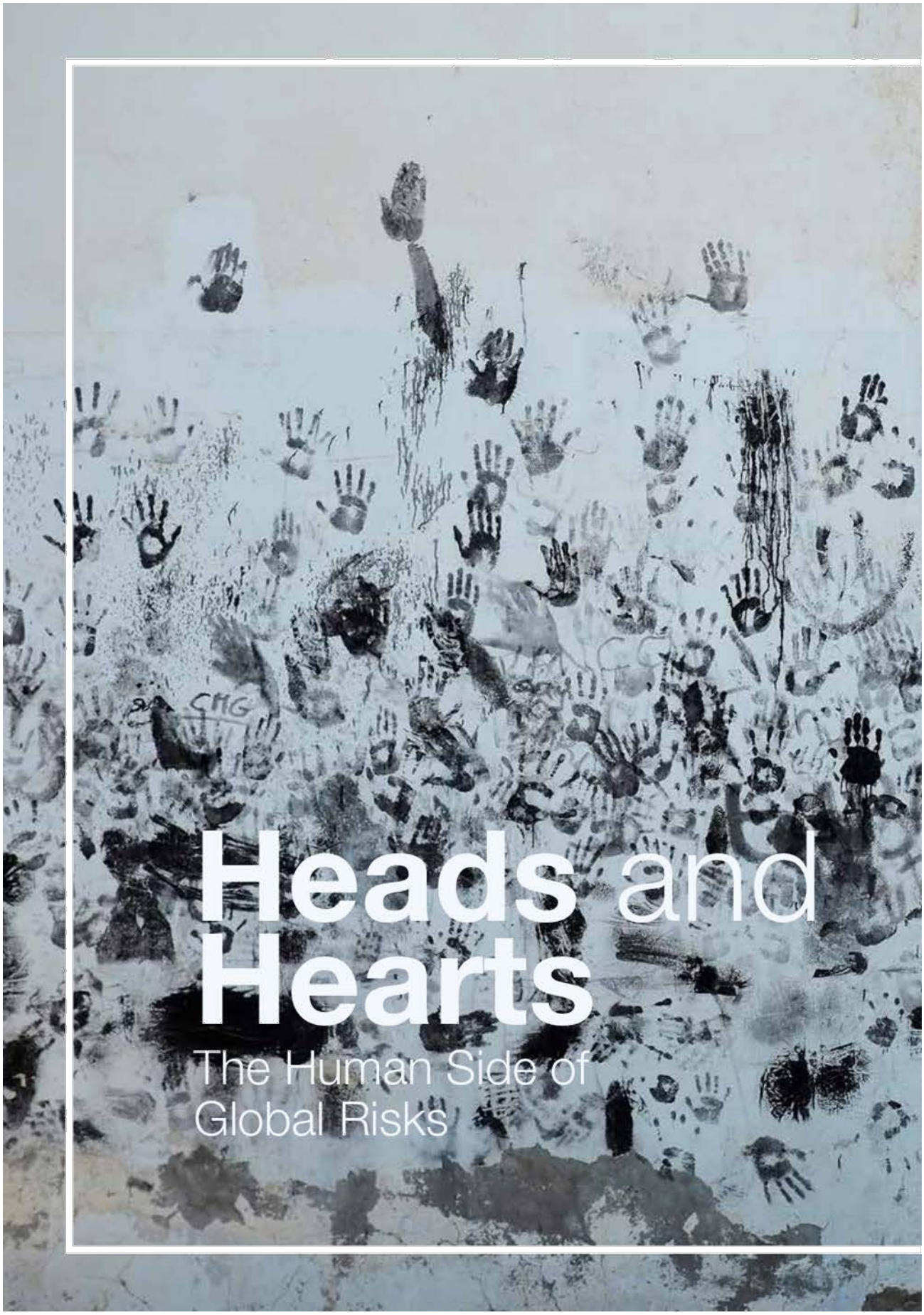
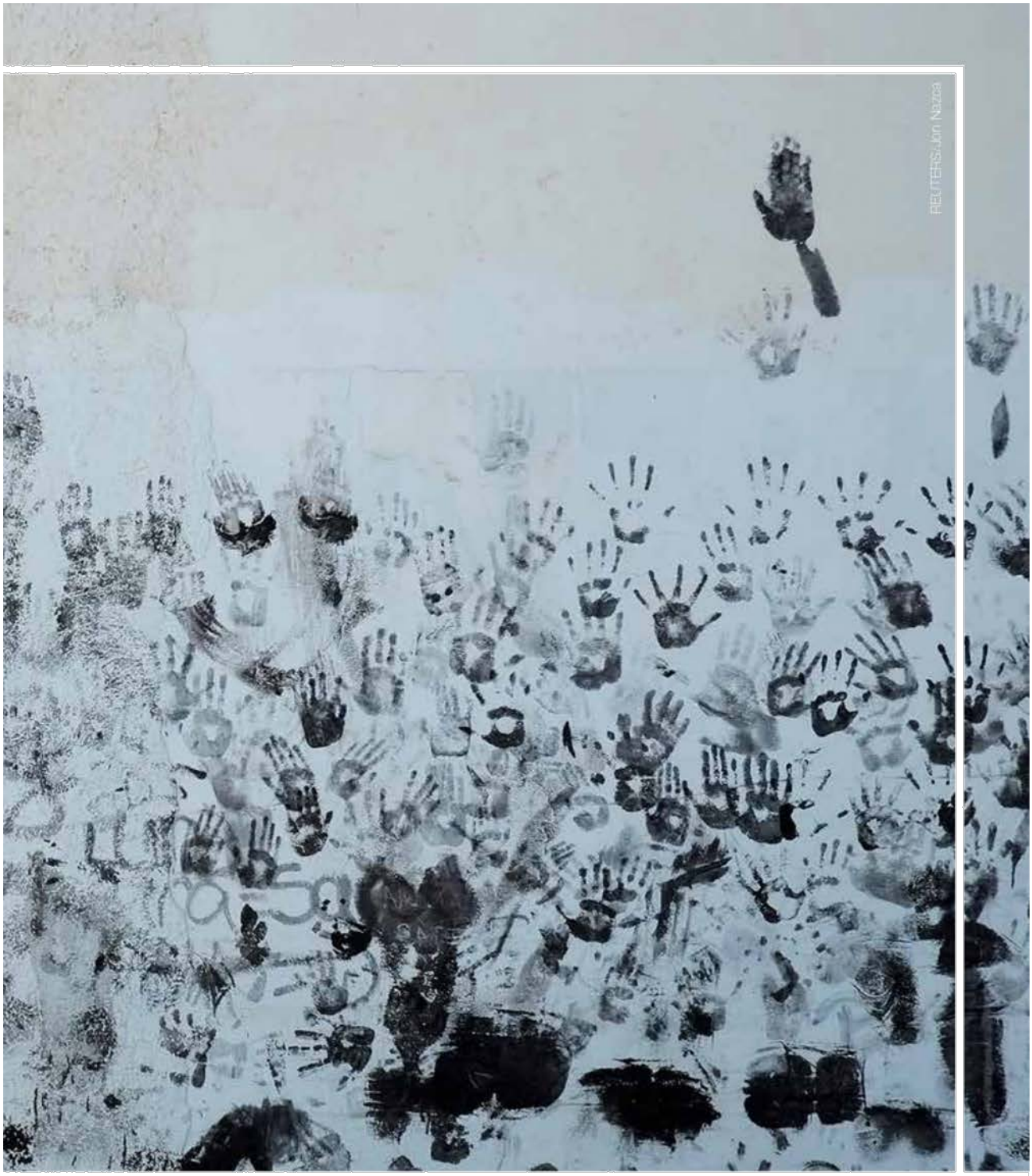

Heads and Hearts
The Human Side of Global Risks



The *Global Risks Report* tends to deal with structural issues: systems under stress, institutions that no longer match the challenges facing the world, adverse impacts of policies and practices. All these issues entail widespread human costs in terms of psychological and emotional strain.

This is usually left implicit but it deserves more attention—and not only because declining psychological and emotional well-being is a risk in itself. It also affects the wider global risks landscape, notably via impacts on social cohesion and politics.

This chapter focuses explicitly on this human side of global risks. For many people, as explored in the first two sections, this is an increasingly anxious, unhappy and lonely world. Anger is increasing and empathy appears to be in decline. The chapter examines the ramifications of complex transformations in three areas—societal, technological and work-related. A common theme is that psychological stress is related to a feeling of lack of control in the face of uncertainty.[1]

The age of anger

Every year Gallup takes a large-scale snapshot of the world's emotional state. It asks respondents—154,000 across more than 145 countries in 2017—whether they had various positive and negative experiences on the preceding day. Overall, the positive experiences (such as smiling, respect and learning) comfortably outstrip the negative (which include pain, worry and sadness)—but the trend lines are worrying.

700 million people are estimated to have a mental disorder

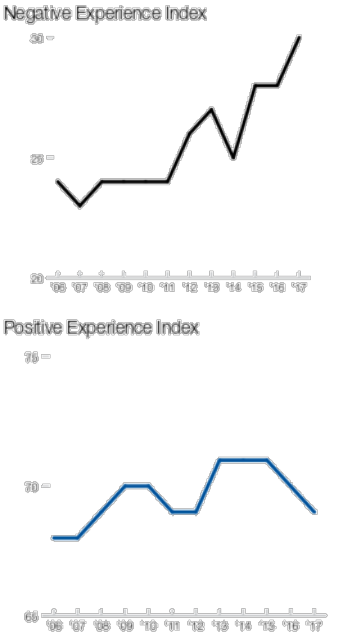
As illustrated by the graphs in Figure 3.1, the positive experience index (a composite measure of five positive experiences) has been relatively steady since the survey began in 2006. Meanwhile, the negative experience index has broken upwards over the past five years. In 2017, almost four in ten people said they had experienced a lot of worry or stress the day before; three in ten experienced a lot of physical pain; and two in ten experienced a lot of anger.[2]

Although still the least prevalent of Gallup's negative experiences, anger is commonly referenced as the defining emotion of the zeitgeist. Some suggest this is an "age of anger", noting a "tremendous increase in mutual hatred."[3] And while it is conceivable that public anger can be a unifying and catalysing force—a hope often expressed at the start of the decade in relation to the Arab Spring[4]—it has since come to be seen more as politically divisive and societally corrosive.

In the United States, public opinion researchers note that where opposing political groups previously expressed frustration with each other, they now express fear and anger.[5] In one survey, almost a third of respondents reported having stopped talking to a family member or friend over the 2016 presidential election.[6] In another, 68% of Americans said they were angry at least once a day; women reported themselves more angry than men, as did the middle class relative to their richer and poorer peers.[7]

Anger has long been associated with loss of status.[8] Recent research also suggests a strong link with group identity.[9] The risk is that this combination generates angry polarization—an increasingly

Figure 3.1: Emotional Downturn



Source: *Gallup 2018 Global Emotions Report.* https://www.gallup.com/analytics/241961/gallup-global-emotions-report-2018.aspx

Note: Scores on the two indices range from 1 to 100. Higher scores on the Positive Experience Index indicate more positive experiences; on the Negative Experience Index they indicate more negative experiences.

prevalent feature of politics in many countries. And as further explored in the technology section below, in recent years group identities have been hardened by a process of "social sorting" that has eroded traditional, cross-cutting societal ties.[10]

Global trends in mental health

Gallup's finding that negative experiences are on the rise chimes with World Health Organization data suggesting that depression and anxiety disorders increased by 54% and 42%, respectively, between 1990 and 2013.[11] They rank second and seventh, respectively, in the global burden of disease; five of the top 20 are mental illnesses.[12] Worldwide, 700 million people are estimated to have a mental disorder.[13]

Not all data confirm the finding that the prevalence of mental health problems is rising, but there are indications that the current generation of young people in particular are experiencing significant increases. In the United States, for example, the proportion of the total population with depression increased from 6.6% in 2005 to 7.3% in 2015, but the rise was much sharper for individuals aged between 12 and 17, where prevalence increased from 5.7% to 12.7%.[14] One study found that between five and eight times as many US students in 2007 reported psychopathological symptoms on a standardized survey than their counterparts in 1938. These trends are particularly pronounced for American girls—in 2016 one in five had experienced a major depressive episode in the previous year.[15] Concerns have been raised about a loosening of diagnostic criteria, but behavioural evidence points in the same direction. The rate of self-harm for girls aged between 10 and 14 nearly tripled between 2009 and 2015 and the suicide rate for 15- to 19-year-olds increased by 59% over the same period.[16]

Recorded rates of mental health disorders are higher in the West—the lifetime prevalence rate for anxiety ranges from 4.8% in China to 31% in the United States. Suggested explanations for this have included reporting bias, methodological factors and the possibility that in poorer circumstances mental suffering is more likely to be seen as an expected part of life than a diagnosable condition.[17] Nonetheless, people with mental health conditions in lower-income countries can face profound difficulties: one study across 28 countries found treatment gaps of up to 85%.[18]

Within affluent countries, wealth affects well-being in complex ways. The prevalence of anxiety disorders is higher among lower-income groups. But attitudes towards money matter too—researchers have linked reduced well-being to societal shifts away from intrinsic motivations (related to community feeling and affiliation) and towards extrinsic motivations (related to financial success and social status).[19] This is generationally significant: in one US study, 81% of 18- to 25-year-olds said that getting rich was their generation's top or second goal, compared to 62% of 26- to 39-year-olds.[20] Another important generational pattern relates to expectations of increasing quality of life. As illustrated by Figure 3.2, there is significant variation across countries in terms of young people's

Where opposing political groups previously expressed frustration with each other, they now express fear and anger

perceptions of how their lives will compare to those of their parents. Only 5% of survey respondents in China expect to live a worse life than their parents, compared with 30% in the United States and the United Kingdom and almost 60% in France.[21]

Violence, poverty and loneliness

What is contributing to these patterns of increased negative experience? Societal stressors are the first potential driver considered. Violent conflict remains one of the most potent causes of emotional and psychological distress. There is a danger of complacency here, because conflict-related deaths have fallen sharply since the middle of the 20th century, as shown in Figure 3.3. However, as the figure illustrates, the overall number of conflicts is close to the highs of the early 1990s and has risen in recent years.[22] While not mass death conflicts, these are clearly a source of emotional and psychological distress for huge numbers of people, particularly in Africa, the Middle East and South Asia.[23]

Figure 3.2: Life Prospects

"Will you have had a better or worse life than your parents' generation?" (% of respondents)

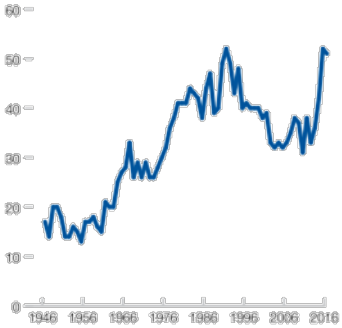
Source: Ipsos Global Trends, 2016. https://www.ipsosglobaltrends.com/life-better-or-worse-than_parents/

The same is true for violence of other sorts. The prevalence of homicide is particularly important, because it influences overall perceptions of security.[24] Although the global rate fell for a decade before a marginal uptick in 2016,[25] regions are affected very differently: Latin America accounts for 8% of the world's population but 33% of its murders.[26] Similar trendlines are not available for "intimate partner violence", but the World Health Organization estimates that around 30% of women globally experience it during their lives, and that it doubles the risk of depression.[27] In 2017, 137 women were killed every day by intimate partners or family members.[28]

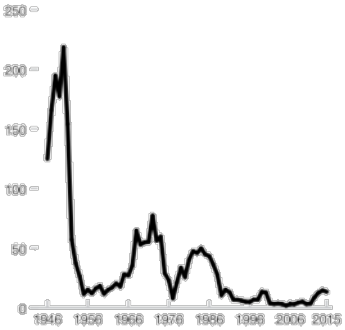
The proportion of the world's population living in poverty has dropped significantly in recent decades, alleviating one of the key threats to physical and mental well-being,[29] but increases in the global population mean the absolute numbers are still extremely high. In 2015 there were 736 million people

Figure 3.3:
Conflict and Death

Number of conflicts, 1946–2016



Battle deaths per 1,000,000 people, 1946–2016



Source: Uppsala Conflict Data Program. http://ucdp.uu.se/; Max Roser, "War and Peace", 2018. https://ourworldindata.org/war-and-peace.

living on less than US$1.90 a day, and numbers were increasing in Sub-Saharan Africa, the Middle East and North Africa.[30] And even in high-income countries, income and wealth disparities—ranked fourth as a driver of the global risks landscape in our survey this year—have been linked to increasing mental health problems.[31]

A third societal stressor is loneliness. This is on the rise, in the West in particular, where household structures have been undergoing a profound shift.

Researchers call the current share of people living alone "wholly unprecedented historically".[32] In the United Kingdom, the average proportion of single-person households has increased from around 5% in pre-industrial communities to 17% by the 1960s and 31% in 2011. Similar figures are recorded in Germany, Japan, the Netherlands and the United States.

Many capital cities have even higher proportions of so-called "solitaries"—for example, 50% in Paris and 60% in Stockholm. In midtown Manhattan 94% of households are single-person. Researchers argue that urbanization can weaken family and other bonds relative to smaller, rural communities;[33] this may help to explain high-income countries' apparently higher prevalence of mental health problems.[34] Evidence of psychological strains related to urbanization also comes from emerging economies: in China, where the rural population plunged from 80.6% to 45.2% between 1980 and 2014,[35] research finds increased levels of loneliness both among migrants moving to cities and in the rural communities they have left.[36]

The latest official data in the United Kingdom point to an increase to 22% in 2017 in the proportion of people feeling lonely either sometimes, often or always, up from an average of 17% in 2014–16.[37] The proportion of people never feeling lonely decreased from 33% to 23% over the same period. A US study looked at how many close friends people have: the average fell from 2.9 in 1985 to 2.1 in 2004, and the proportion of people responding that they had no close friends tripled over that period to become the modal response.[38]

Research suggests that people who describe themselves as lonely have as much social capital as their non-lonely peers.[39] One of the behavioural patterns linked to loneliness is poorer sleep quality, which has knock-on effects on individuals' wider resilience.[40] There are early signs that the potential societal impacts of rising loneliness are beginning to be recognized as a problem requiring attention—in early 2018, the United Kingdom added loneliness to the remit of one of its government ministers.

30%

women who experience "intimate partner violence" during their lives

Technology, addiction and empathy

In one recent study, technology was cited as a major cause of loneliness and social isolation by 58% of survey respondents in the United States and 50% in the United Kingdom.[41] However, the same survey found that social media was viewed as making it easier for people to "connect with others in a meaningful way", and respondents who reported feeling lonely were no more likely than others to use social media. These findings exemplify the uncertainty around how technological changes impact individual well-being. Technological change is always a source of stress, but the current wave of change—the Fourth Industrial Revolution—is defined by the blurring of the line between the human and the technological.

Debate, for example, surrounds the claimed addictiveness of digital technologies.[42] UK research in mid-2018 found that people spend an average of 24 hours per week online—more than twice as much as in 2011.[43] At least one prominent endocrinologist has likened digital technologies to addictive substances—in that they stimulate dopamine, which produces pleasure, but also require increasing use to get the same effect.[44] Many business models rely on the efficiency with which new technologies can attract and retain users' attention; some companies have even marketed their ability to leverage the behavioural impact of dopamine.[45] However, others argue that claims of addictiveness are alarmist or overblown:[46] the UK research found people still spend less time online than they do watching television.

Researchers looking at early child development are worried less by addiction than risks of "functional impairment"—that digital technologies could crowd out interpersonal interactions that provide the building blocks for subsequent development, such as the ability to "concentrate, prioritize, and learn to control passing impulses".[47] The American Academy of Pediatrics now recommends that children up to 18 months old use screens only for video chats, and a limit for children up to 5 years old of one hour of "high quality" programming, watched with a parent.[48]

Among adolescents, a study of more than 500,000 US school students found those who spent more time on digital media—relative to non-digital activities such as sports, in-person interactions, homework, printed media or religious services—were more likely to report mental health issues.[49] Critics contest these findings, particularly for moderate levels of screen time. They also note that even with high levels of screen time the effects remain small compared to, for example, missing breakfast or not getting enough sleep.[50]


REUTERS/Juan Medina

Another potential concern is that technology is leading to a decline in empathy, the ability to put oneself in the shoes of another. One study of students in the United States found that levels of empathy had fallen by 48% between 1979 and 2009;[51] however, possible explanations for this other than the greater use of personal technologies include increasing materialism and changes in parenting practices. Debate often centres on how digital echo-chambers can weaken cross-society empathy by anchoring individuals in tight-knit sub-groups.

Other technologies also play a role—such as online dating platforms leading to sorting and matching processes that researchers find are reducing cross-cutting societal bonds.[52]

The relationship between technology and empathy seems to be nuanced: online connections can be empathetic, but research suggests the effect is six times weaker than for real-world interactions.[53] Some believe virtual reality (VR) technologies will become an "engine for empathy".[54] Others note, for example, that current online gaming is negatively correlated with empathy,[55] which might suggest that more immersive VR versions of similar games would strengthen the negative effect. Some suggest that emotionally responsive robots could tackle loneliness, particularly in care-related settings. But this is not without potential risks—we consider potential dangers in Future Shocks, on page 73.[56]

Automation, monitoring and workplace stress

Technological and societal change is linked to rapid transformations in the workplace—and what happens at work has the potential to affect emotional and psychological well-being.[57] According to a survey of full-time employees in 155 countries, just 15% feel "highly involved in and enthusiastic about their work".[58] This "engagement" rate varies from 33% in the United States to just 6% across East Asia, a result the researchers attribute to overwork. Globally, a higher proportion of employees—18%—were found to be actively disengaged, defined as "resentful and acting out their unhappiness".[59]

For many workers, a pronounced recent change has been a blurring of the line dividing work from the rest of life.[60] Work-related emails often begin long before the start of nominal working hours and finish long afterwards. Many families juggle multiple jobs with childcare, stressful commuting logistics and caring for elderly parents. In growing numbers, employees cite the ability to manage work/life balance as the most important thing for thriving at work.[61] According to one study, 50% of American workers say they are