Globalisation, youth disillusionment, digitalization, tech governance failure, pandemic, automation, the rise of China, climate change, EU policies are only a few of the drivers that have created new risks, opportunities and challenges for European universities. Those drivers are testing the fragility of universities. Nevertheless, universities have done little to change their traditional modus operandi, thus facing serious difficulties to address current and future challenges. This think tank should entice dialogue on potential opportunities for innovation and serve as an inspirational lighthouse for the future development of universities directly impacting their anti-fragility.
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Abstract
Rules of Procedure of Anti-fragility Think-Tank (AFTT) are defined to be developed and adopted under the task 2.1. Establishment of AFTT. The first version of the Rules of Procedure of AFTT was presented and adopted by the Executive Committee in Gdansk in December 2021. At this meeting, AFTT was established. After several AFTT meetings in 2022, the conclusion was that the Rules of Procedure need to be more flexible so AFTT as the body can efficiently work and members can participate in the meetings in a more accessible way.

 Versions and contributions history

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List of acronyms

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1. Introduction

1.1. Commitment and support of AFTT from the Alliance

The AFTT has been entrusted by the Alliance to be the body:

a. for discussion and guidance on the antifragility concept and its implications
b. for anticipation of changes and trends
c. for contributing to the future shaping of the universities

As a commitment to support the work of AFTT, all SEA-EU Alliance universities will recognise Memorandum of Understanding, as a manifesto guiding the work and sustainability of AFTT.

1.2. Adoption, amendments and submission of Rules of Procedure

All partners shall be consulted during this document’s creation, adoption and submission. In addition, this document shall undergo an approval process from the SEA-EU official bodies. Adopted Rules of Procedure shall be available on the official SEA-EU dedicated website.

Amendments to the Rules of Procedure may be placed on the agenda at any AFTT meeting.

2. Organisation of AFTT

2.1. Executive Committee and Nominations

The SEA-EU Executive Committee is the reporting body of the AFTT.

Each university of the Alliance shall nominate the members of the AFTT to the Secretariat.
The Secretariat shall present the nominees to the Executive Committee and ask for their appointment as members of the AFTT.

The Executive Committee shall decide with a majority of votes of those present, for each nominated member.

The Executive Committee may decide on removal from term of office if a member of AFTT does not observe the highest standards of ethical conduct adopted and promoted by the Alliance.
2.2. Members

The AFTT members shall hold a 2-year term of office. The term of office begins on the day of their appointment by the Executive Committee. The number of terms of an AFTT member is not limited. If the member of AFTT is unable to complete her or his term, a replacement shall be appointed to hold a term of office for the remainder of her or his term.

2.3. Secretariat

As secretariat UNIST manages AFTT and shall have the following roles:

a. moderates AFTT meetings by providing guidance and support
b. assists in the preparation of the agenda and leads the correspondence in the preparation and discussion during the AFTT meeting
c. maintains and distributes the minutes and other official records of AFTT
d. assists the AFTT and Task Teams in complying with these Rules of Procedure and other duties required by these Rules of Procedure

2.4. Chairperson

The Chairperson shall have the following roles:

a. presides in AFTT meetings with the support of the Secretariat
b. represents AFTT externally and towards the Executive Committee
c. prepares the agenda, assisted by the Secretariat body
d. other duties in cooperation with the Secretariat body

The Secretariat shall ask members of AFTT for the nominations of the Chairperson. The Secretariat will share the nominations in advance. Members of AFTT shall vote on nominees. The Chairperson shall be the AFTT member with the majority of votes.

Voting shall be done by a show of hands from all members present at the meeting or by sending an electronic poll to the AFTT members.

AFTT Members cannot be represented by any other person in meetings or otherwise.
2.5. Working Groups

AFTT may establish temporary Working Groups which may have the function of providing analysis, research, studies, or any other expertise needed by the AFTT.

The Secretariat shall prepare meetings and assist the AFTT Working Groups and ensure their smooth functioning.

3. Functioning of AFTT

3.1. Meetings

The date of meetings will be set by the Secretariat in communication with the Chairperson. English shall be both the official and the working language of AFTT. Meetings shall be conducted primarily virtually with the possibility of organizing them in person.

AFTT can invite other participants to follow the meeting. Only members of AFTT can participate in the discussion while all other participants and observers do not have a right to take part in the debates unless this is allowed by the Chairperson prior to or during the meeting.

3.2. Meeting reports

Written records shall be kept of all meetings of the AFTT. The draft report shall be circulated to all members who have participated in the meeting in order to give them an opportunity to provide comments.

The Secretariat shall be responsible for keeping the minutes. After the meeting, the minutes' report shall be distributed electronically to the AFTT members by the Secretariat. The minutes' report shall also be approved electronically.

3.3. Outputs

Opinions expressed in the open public recommendations are those of members of AFTT and should not be considered as the official opinions or statements of SEA-EU Alliance and its universities or its funding bodies.

Each meeting will be recorded and the recording could be published publicly if all participants of the meeting give consent for it. Each appointed AFTT member with the act of the appointment is considered to give consent to the sharing of the recorded materials with the broader public.
All documents produced and published by the AFTT shall require the adoption of a Creative Commons License for Attribution, Non-Commercial, No-Derivatives 4.0 International (CC BY-NC-ND 4.0).

In the case of the publications in peer-reviewed journals which result from the work done by the Working Groups, they must ensure open access to all peer-reviewed scientific publications relating to its results.
D2.1 (b)
Report on AFTT key areas of impact
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Rules of Procedure and key areas of impact of Anti-fragility Think-Tank (AFTT) are defined to be developed and adopted under task 2.1. Establishment of AFTT. The main idea of the Report on AFTT's key areas of impact is to advise and anticipate changes and trends participating in the future-shaping of universities.

Versions and contributions history

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<td>Markić Nikola Balić</td>
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Introduction

The concept of antifragility is original for the university as a system, and it would be especially novel and fit for European university alliances.

AFTT (Anti-Fragility Think-Tank), under its mission, identifies antifragility sources and key areas of impact. The main idea is to advise and anticipate changes and trends participating in the future-shaping of universities. AFTT forms a high-level network of thought leaders from a rich diversity of expertise. AFTT actively advocates for paradigm and systemic shifts to produce recommendations and guidance.

Understanding the current status of play and learning in the context of research and innovation within the SEA-EU alliance was one of the first AFTT responsibilities.

Universities are complex and interconnected institutions that involve networks of persons and groups from all over the world that rely on one another to function properly. Because universities are transnational in nature, a large-scale crisis such as a natural disaster, a global disease epidemic, or political turmoil might be difficult for them to deal with. Similarly, a crisis that strikes on a smaller scale, on campuses or in the region, has a significant likelihood of swiftly disrupting university operations.

Finding how organizations can survive and even improve or gain benefits in disruptive environment scenarios is a relevant research area for which resilience and antifragility represent two significant approaches. The university's resilience is defined as its ability to endure and recover from long-term negative shocks while continuing to provide the services that support its raison d'être — most notably, research and innovation — largely with the same purpose, structure, and feedback. Antifragility goes beyond resilience, describing the property of the system to improve and thrive as a result of shocks, disturbances and failures.

The duration of an institution is a good indicator of how fragile or antifragile it is since, over time, it undeniably is subject to many disturbances and stressors. In that respect, universities, as a form of institution existing for almost 1.000 years, are showing clear signs of antifragility.

The COVID-19 pandemic challenged universities to quickly transition daily activities to a new paradigm. Because of the pandemic's global and broad impact, the support of the entire economic and social system, and the percolation of digitalisation into our daily lives, some activities (administration, management, lectures, etc.) were unaffected, allowing a smooth transition to a virtual working environment. However, operations requiring field and lab work were virtually halted (ERF-AISBL review of analytical facilities working practices during the COVID-19 pandemic), demonstrating variances in resilience and anti-fragility across universities and their activities in times of crisis. Most
universities, including the SEA-EU alliance have managed not only to survive but to improve under the caused stress.

Universities are antifragile due to their diversity and openness. Alliances like SEA-EU can assist in making universities more antifragile as this allows for sharing resources, skills, experiences, and management approaches. This also increases the chances of positive events where new research is launched. Experimenting with new models that challenge the usual way of doing things and learning from both successes and failures is an effective approach toward creation of antifragile institutions, which is at the heart of building European University alliances.

We can and should learn from the X-events. We can and should become not only passively adaptable but actively analyzing and modifying the systems. The role of the AFTT is to assist the alliance in achieving this goal.
Key areas of impact

Antifragility operations monitor and respond to ongoing changes in the system’s influencing elements. Such alterations may go unnoticed until the ongoing transformation reaches a tipping point and manifests itself as a radical and abrupt occurrence. Continuous antifragility action could aid in the prediction and mitigation of such situations.

Following team discussions, AFTT members identified major areas of influence. The fundamental goal is to advise on and foresee developments and trends that will shape the future of universities:

- To create the "manifesto" of antifragility in HEIs and PROs that would summarise the key points in an inspirational and easy-to-read format.
- To work on a joint research proposal that could concentrate on the role of the new SEA-EU Alliance ecosystem and its future scenarios. To build relevant proposals concentrating on particular challenges, e.g. future education models, AI impact on research, and responding to society's needs.
- To initiate the research on antifragility and to propose an antifragility toolset based on the validated criteria.
- To discuss the attributes of fragility/antifragility in the literature from the perspective of the university/alliance.
- To transfer the antifragility concept to the university environment and make it more understandable. To introduce this concept in the academic discourse closely related to the university context. The term needs to be understood from both long and short-term perspectives.
- To produce “case studies” or “lessons learned”.
- To discuss the potential fragilities that could cause the failure of the university missions, how to remove them, and how to create conditions for becoming more antifragile.
- To assess the alliance-level antifragility contribution. The proposed discussion challenges could be energy, waste, climate change, mass tourism, the current war in Ukraine, or even the economic crisis.
- To react and monitor the particular crisis that can happen and affect universities, like, e.g. sudden social, economic, or political events in a particular country, and help to build emergency/contingency plans.
- To advise on the major challenges related to the Alliance itself and be part of the progress and policies evaluation processes focusing on the Alliance's sustainability and global higher education trends.
- To engage in a global discussion on HEIs, for example, within EUA and other major EU events and conferences.
● To educate the system members to react appropriately to unpredictable events, i.e., to teach them the skills of flexibility, improvisation, agility, adaptability, and stress handling.
● To organize workshops that bring out the recommendations made through dedicated workshops around specific problems.
ANNEX 1.

AFTT's first report towards key areas of impact

University of Split
compiled by Nikola Balić

September 2022
AFTT members
An expert task team was constituted with representatives from all partner institutions:

- Leandra Vranješ Markić (UNIST)
- Antonio Šarolić (UNIST)
- Annegret Kuhn (CAU)
- Nicole Schmidt (CAU)
- Lionel Prigent (UBO)
- Lionel Honoré (UBO)
- Joanna Morawska (UG)
- Izabela Disterheft (UG)
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- Elisabeth Conrad (UM)
- Margaret Camilleri Fenech (UM)
- Jose Antonio Perales (UCA)
- David Jiménez Pavón (UCA)
- Ana Carbonell (UCA)

UNIST task team members:

- Mile Dželalija (UNIST)
- Ana Marušić (UNIST)
- Leandra Vranješ Markić (UNIST)

Reporter: Nikola Balić (UNIST)

1 present at a meeting in September 2022
Introduction

The antifragility concept [1] is novel for the university as a system and would particularly be novel and appropriate for the European universities’ alliances.

AFTT (Anti-Fragility Think Tank), under its mission, identifies antifragility sources and key areas of impact. The main idea is to advise and anticipate changes and trends participating in the future-shaping of universities. AFTT forms a high-level network of thought leaders from a rich diversity of expertise. AFTT actively advocates for paradigm and systemic shifts to produce recommendations and guidance.

One of the first AFTT tasks is understanding the current state of play and learning in the context of research and innovation throughout the SEA-EU alliance.

Thematic session on the current state of play is available on youtube (https://www.youtube.com/watch?v=rIdVH69XzaQ&t=1575s).
September session

Turbulence and unexpected disruptive events (X-events) are showing an increasing frequency and growing impact, representing significant challenges for the sustainability of the universities. Therefore, finding how organizations can survive and even improve or gain benefits in disruptive environment scenarios is a relevant research area for which resilience and antifragility represent two significant approaches. We can and should learn from the X-events. We can and should become not only passively adaptable but actively analyzing and modifying the systems.

AFTT Meeting took place in Split on the 1st and 2nd of September 2022. The meeting was loosely structured around the agenda, using an open format, and welcoming any contributions to the discussion.

One of the participants noted: "We had an incredibly open AFTT meeting, both in terms of its format, which allowed everybody to extensively reflect on the antifragility issues, and in terms of the discussions, which were very open-minded."

During the meeting, think tank members collectively agreed that attributes and the survey proposed in Ref. [2] might not be suitable for the universities. Still, discussing these attributes could help elucidate the antifragility concept of the Alliance and universities.

Reflections on the attributes that enhance antifragility

The work of Johnson and Gheorghe [2], who provided a simulation model of an antifragile system and proposed a framework for evaluating and quantifying antifragility based on the concepts of systems of systems, has been studied during prior AFTT sessions. Using the framework, a multidimensional idea of fragility is reduced to a set of attributes on a two-dimensional continuous interval scale.

**Non-Monotonicity.** It is connected with learning from mistakes as an effective defence against stressors. Therefore, the message would be to discuss our successes, failures, and mistakes and build new practices and approaches that will make our universities better at fulfilling their missions. This approach is the basis for building the European University alliances, where we are experimenting with novel ways of cooperation in the study, research and interactions with society and the economy. Some of our approaches will undoubtedly fail, but if we keep learning from these failures, we will move toward an antifragile alliance. It would be worth discussing how we can ensure this learning happens and spreads through our universities.

**Stress starvation,** where the authors explain how withholding stress or reducing uncertainty can cause weakness and fragility of systems and expose them to hazardous X-Events. There are also many examples in different life fields in Ref. [1]. The theory then suggests that the right path is to apply regular and controlled stress to a system to increase its robustness and potentially become antifragile. Through the Alliance, we are challenging the usual way of doing things. It is sometimes heard in discussions on creating joint activities that we do not do things this way, and there is sometimes much resistance. So, it could be beneficial to highlight other examples from the universities where the controlled stress benefited the system.
Balancing Constraints vs Freedom is a vital attribute closely connected to academic freedom. As discussed in Ref. [1], the optimum condition for a system is a balance of constraints and degrees of freedom, and too much openness increases the exposure to X-Events. For universities, the necessary constraints should be the academic principles (research integrity, financial accountability, ...) which should minimise the possibility of negative X-events. A lot of those negatives can be eliminated by knowledgeable administrative support. On the other hand, the significant discoveries and inventions can be regarded as positive black swans (an unpredictable event that is beyond what is typically expected of a situation and has potentially severe consequences), which are inherently unpredictable. It is exceptionally beneficial for universities to be as open as possible to other institutions. Universities need to maintain the mix of curiosity-driven, fundamental research with research that is more applied and more connected to the needs of our environment. The formalities and administration should be simplified and minimized as much as possible so as not to stifle research. This approach can create significant benefits if one takes care of potential financial risks.

Emergence appears when the system outputs cannot be directly traced to activities or functions of its components, so the system is more than the sum of its constituents and X-Events are produced. The reaction to the COVID-19 pandemic had the attributes of emergence in the sense that very quickly people managed to reorganize their teaching and collaborations; there was quick self-organizing and spreading the good practice. The changes regarding online learning, which we thought would take years to accomplish before the pandemic occurred within two weeks. We can recognize the emergence in times of other crises aided by social networks, the individual response comes even before the organizations can reply. It is crucial to figure out how we can enable the emergence within our Alliance, for example, in research. Therefore it would be worth exploring how emergence appears in networks so that we could propose a framework for creating alliance research networks that could grow organically.

Entropy is very well defined in physics (although there are several definitions and some open discussions), but as a concept is increasingly used in other fields, not always with the same meaning. Ref. [2] states that systems tend to increase in complexity over time and, in the process, lose the ability to use the information to transform inputs into desired outputs. In a sense, this means that the measure of the unknown (which is also a way in which one can understand the statistical definition of entropy in physics), increases. In Ref. [2] This increase in the number of potential states that the system can be found in is linked to the growth in disorder and the emergence of X-states.

The participation of a particular university in a European university alliance, such as the SEA-EU, certainly increases the complexity of the system. The possible large and small benefits are clear, while the large negative X-event is not visible. However, we have to be aware that we could be creating additional (administrative) complexity in the lives of our students and staff and should find ways to reduce it. The experience has shown that many potentially interested academics lack time, as they cannot replace their teaching workload or mentoring with the alliance activities, or are overloaded with information and don’t perceive direct interest. So, not to miss out on potential benefits, some work needs to be done to recognize and reduce the barriers to involvement in alliance activities.

Considering the Efficiency vs risk attribute. Being completely efficient is desirable but is risky if the people/processes/supplies suddenly become unavailable (sensitivity to negative X-events).
In the university environment, the risk can e.g. be to have a very valuable project which rests on a single researcher who is not easily replaced. Alliance can reduce the risk in the sense of, e.g. joint mentorship of Ph.D. students, sharing of physical resources, ...

**Redundancy**, which means having duplicate components that are required for a function or duplicate functions to meet the same objectives, reduces the efficiency but also the risk, making the system more robust. As mentioned in the previous attribute, alliances could help in this way, e.g. by sharing staff. We are creating joint offices (e.g. Technology Transfer Office, Projects Office, ...), which, although it might not be their primary goal, could help when a critical competence is lost in one university. From the view of redundancy, allowing employees to acquire wider competencies than required by their current job is also beneficial.

Considering the **Coupling (Loose/tight)** attribute. Ref. [2] points out that the tighter the coupling between the systems, the more fragile the systems become. The European alliances represent loosely coupled organizations, where an extreme event in one of the universities would not destroy the Alliance, which is a feature that should be preserved in the future. It is an excellent feature to maintain in creating other organizational structures within the Alliance. As we are experimenting with different models of cooperation, it is expected that some models will not work, and it’s essential that potential failure does not affect the rest of the activities but instead becomes a source of learning.

**Requisite Variety** is about the number of regulators vs agents. If the students and staff are the agents, the regulators could be viewed as the procedures that reduce the complexity and manage the interactions.

**Absorption** would be the margins that absorb the stress so the system can continue in an unintended state. From the alliance perspective, we have already introduced some safeguards in SEA-EU 2.0 by having joint leadership of some activities, which can absorb some of the stress that can occur in one partner institution. More thought should be given to how one can create more ways to absorb stress.

**Towards the key areas of impact**

We accept that reality is unpredictable. Antifragility requires not only adaptation but also mitigation measures as well as risk assessment and building the culture of learning from failures.

It is crucial to find the right language to "translate" the concept of antifragility and the whole philosophy in the context of higher education institutions (HEI) and public research organizations (PRO) so that it becomes more widely spread and hopefully accepted in the academic world. For instance, we should shift from negative metaphors like "disorder" to the ones that describe continual complications of the systems, such as "entropy". We should not use the language of gains and losses but rather the lexis of learning from experience.

Complex systems are inherently unpredictable and entail the possibility of extreme events, which can be both positive, such as unexpected discoveries, or negative, such as market crashes or wars. Antifragility always exists up to a point, and if the stress increases above a certain threshold, then the system breaks. The duration of an institution is a good indicator of how fragile or antifragile it is since, over time, it undeniably is subject to many disturbances and stressors.
In that respect, universities, as a form of institution existing for almost 1,000 years, are showing clear signs of antifragility. The recent COVID-19 pandemic has shown that most universities have not only survived but managed to improve under the caused stress. However, the pandemic has also resulted in the closure of some higher education institutions, e.g. in the US and Australia, whose financial model was too fragile. This shows that although generally, universities may be antifragile, depending on the intensity of the stress and specific context, a particular university could be significantly disrupted to the point of survival.

Universities are antifragile due to their diversity and openness. Alliances like SEA-EU can assist in making universities more antifragile as this allows for sharing resources, skills, experiences, and management approaches. This also increases the chances of positive events where new research is launched.

Antifragility is linked to the mentioned X-events, considered discrete, sudden, unpredictable events, such as a pandemic, earthquake, or similar. The creation of the set of recommendations is questionable for handling such X-events. The set of recommendations should recommend how to act in the situation of the X-event. However, X-event is not an X-event if it is predictable. Hence, the set of recommendations could be useless in the situation of the X-event not predicted by the recommendations.

The X-events can also be divided into those whose magnitude is within the affected system's absorption capacity and those above that capacity. The former can be handled either by the mechanisms embedded in the system or perhaps by the inherent power of the system itself. In such cases, the recommendations could be at least partially practical. For the radical X-events, the recommendations could prove useless.

Apart from X-events, the antifragility activities could be directed to observe and respond to the continuous changes in the factors affecting the system. Such changes might remain unnoticed until the continuous change overcomes the breakpoint and reveals itself as a radical and abrupt event. Continuous antifragility activity could help predict and counteract the events of such developments. In such cases, the set of recommendations could play a valuable role.

Expectations of AFTT and towards key areas of impact:

- To become the body that will integrate experts from various fields and positions.
- To be organized as a rotating advisory agora helping to deal with the major and minor crises and for future scenarios planning.
- To determine the AFTT objectives and make them clear and tangible for all members.
- To organize the work in smaller groups independent of the main AFTT events so that the work done in each meeting contributes to these final objectives.
- To create the "manifesto" of antifragility in HEIs and PROs that would summarise the key points in an inspirational and easy-to-read format.
- To discuss the potential fragilities that could cause the failure of the university missions, how to remove them, and how to create conditions for becoming more antifragile.
● To discuss the attributes of fragility/antifragility in the literature from the perspective of the university/alliance.

● To transfer the antifragility concept to the university environment and make it more understandable.

● To introduce this concept in the academic discourse closely related to the university context. The term needs to be understood from both long and short-term perspectives.

● To initiate the research on antifragility and to propose an antifragility toolset based on the validated criteria.

● To produce “case studies” or “lessons learned”.

● To educate the system members to react appropriately to unpredictable events, i.e., to teach them the skills of flexibility, improvisation, agility, adaptability, and stress handling.

● To organize workshops that bring out the recommendations made through dedicated workshops around specific problems.

● To assess the alliance-level antifragility contribution. Proposed challenges for discussion could be related to energy, waste, climate change, mass tourism, the current war in Ukraine, or even the economic crisis.

● To react and monitor the particular crisis that can happen and affect universities, like, e.g. sudden social, economic, or political events in a particular country, and help to build emergency/contingency plans.

● To identify relevant tools that would take into account such a complex, multicultural and multidisciplinary environment of the Alliance.

● To advise on the major challenges related to the Alliance itself and be part of the progress and policies evaluation processes focusing on the Alliance's sustainability and global higher education trends.

● To work on a joint research proposal that could concentrate on the role of the new SEA-EU Alliance ecosystem and its future scenarios. To build relevant proposals concentrating on particular challenges, e.g. future education models, AI impact on research, and responding to society's needs.

● To engage in a global discussion on HEIs, for example, within EUA and other major EU events and conferences.
Conclusion and next steps

This report has the intention to serve as a first step toward the clarification of sustainability and adaptation of the AFTT role to the detected needs.

AFTT members have identified the need for updated rules of procedure which should lead to a more flexible, open, and democratic model of management. This should include the role of the rotating chairperson. Each mandate should initiate a single topic of observation. When required smaller working groups should be formed as task-and-finish groups. And in exceptional and justified circumstances their work could span more mandates.

In the next period, the next chairperson is expected to be elected via an electronic vote by all members.

Work that must be done to clarify the idea of antifragility in the context of HEIs is one of the obvious next steps. The final product of this endeavor should be an original scientific contribution to the literature. Potential other venues of exploration are evaluation tools and definition of scale.

Open questions:

- how to make AFTT membership personally meaningful?
- should/could the next meeting be organized in person?
- should meetings be organized as facilitated collective writing sessions?
- should we have written preparation for meetings?
- how can we define system boundaries?
- should we avoid specificities and strive for diversity?
- how can we define AFTT grammar and vocabulary?
- how can we spread antifragility ideas?
References

[1] Nassim Nicholas Taleb, Antifragile: Things That Gain from Disorder