Dis 1: General Info; Common vs. Civil Law; Efficiency [†]

1 General Info

1. **Contact Me**

   You can reach me by **sending me an email** or **attending my (virtual) office hours**.

   - Email me at **travis.cao@wisc.edu** (please start the subject line with "Econ 522").
   - Virtual office hours take place on BBCollaborate Ultra at the following times:
     - Mondays, 8:00 - 9:00am
     - Thursdays, 4:15 - 5:15pm
     - Or by appointment

2. **Discussion Sections**

   - Attendance
     - Live attendance is not required, but strongly encouraged.
     - Recordings will be posted (I tape all of my sections, but only the best one will be posted; all sections cover the same material)
     - Sections will take place on BBCollaborate Ultra at the following times:
       * Fridays, 9:55 - 10:45am
       * Fridays, 11:00 - 11:50am
       * Mondays, 1:20 - 2:10pm
       * Mondays, 2:25 - 3:15pm

       Feel free to attend the one that works the best with your schedule.
     - Side note: I'm toying with the idea of only teaching the two sections on Friday live. Monday sections will then be designated as asynchronized, while I add some extra time Monday afternoon as Office Hours instead. This plan is **NOT** official yet. I'll monitor the Monday attendance for a couple of weeks before making a decision.
       If you have any feedback on this, please feel free to let me know!
   - Handouts
     - Handouts will be available by Thursday midnight, and will be posted on Canvas weekly progress page, and my website.
     - Handout solutions will be posted by Monday night. Same places.

[†] Adapted from Jonathan Becker's Fall 2018 handout

2 Review: Common vs. Civil Law

In lecture, we discussed some differences between the Common and Civil Law traditions. Here are some of the main differences, though this list is by no means comprehensive.

1. **Common Law: "Spontaneous Order"**

> **"Spontaneous"** – Law is created by aggregating all legal precedents, continuously in time (old precedents serve as basis for ruling; new ruling becomes precedent for the future).

- **Origin:** 12^{th}-century England.
- **Location:** U.S., U.K., and most of other English speaking countries.
- **Basis of Law:** Existing practices and social norms.
- **Decision Making:** Based on interpretation of legislation and statutes, with judges constrained by precedents.
- **Communicating Law:** Legal outcomes and principles compiled.

2. **Civil Law: "Planned Order"**

> **"Planned"** – Law is created by explicitly writing down expectations, at some static points in time.

- **Origin:** 18^{th}-century France.
- **Location:** Western Europe, South America, East Asia, and parts of Africa.
- **Basis of Law:** Ancient Roman Law and "pure reason."
- **Decision Making:** Based on interpretation of legislation and statutes.
- **Communicating Law:** Commentaries clarify the meaning of law.

3 Review: Efficiency

1. **Welfare Criteria**
   (a) **Pareto**
   - **Pareto improvement**: any change to the economy which leaves
     - everyone at least as well off as before, and
     - someone strictly better off
   - **Outcome** B **Pareto dominates outcome** A: there is Pareto improvement for moving from A to B.
   - **Pareto efficient allocation**: there exists no more Pareto improvement upon it.

   (b) **Kaldor-Hicks**
   - **Kaldor-Hicks (K-H) improvement**: any change to the economy which increases the total value achieved by everyone in society (i.e. increases the social welfare).
     - In other words, a K-H improvement is a change that could be turned into a Pareto improvement by *adding a set of monetary transfers*.
   - **Outcome** B **K-H dominates outcome** A: there is K-H improvement for moving from A to B.
   - **K-H efficient allocation**: there exist no more K-H improvement upon it.

2. **Pareto vs K-H**
   - Pareto improvement $\xleftrightarrow{\text{allow transfer}}$ K-H improvement (Why?)
     A K-H improvement means that the entire social welfare has increased.
     A Pareto improvement means every individual's welfare cannot decrease.
     So there certainly could be some improvement that makes the entire society better off, but makes some people worse off at the same time (Potential example: Asking some people in a neighborhood to vacate their premise so that a factory can be built). This type of improvement would be K-H, but not Pareto, unless we allow for monetary transfer to compensate the losers.
   - Pareto efficiency $\xleftrightarrow[\text{allow transfer}]{}$ K-H efficiency (Why?)
     A K-H efficiency means the social welfare has been maximized – no more K-H or Pareto improvement is possible.
     A Pareto efficiency, however, might not actually maximize social welfare, since Pareto doesn't allow making someone worse off.
     But if monetary transfer is allowed, the potentially worse-off person will receive monetary compensate, so the society is allowed to move towards a more efficient state, and social welfare will be maximized (i.e. K-H efficiency will be reached)
   - There is a sense in which checking for K-H improvements is more *informationally demanding* than checking for Pareto improvements.
     - To say outcome B is a Pareto improvement compared with outcome A, basically everyone just needs to give a thumbs-up (i.e. nobody is being made worse-off), with someone is so happy with outcome B that he/she is giving two thumbs-up (i.e. somebody is made strictly better-off).
     - However, to say outcome B is a K-H improvement compared with outcome A, we need to know *how much* better- or worse-off all parties are in order to know whether a monetary transfer can make B Pareto dominates A.

3. **Some "factors" that might lead to inefficiency:**

    - Externalities
    - Barriers to trade
    - Non-competitive markets (monopoly or monopsony power)
    - Private information
    - Government intervention (ex. Taxes & subsidies)

    In the Pareto sense, inefficiencies arise when mutually beneficial exchanges don't occur.

    In the Kaldor-Hicks sense, inefficiencies arise when there exists untapped potential to make a change where net-benefits outweigh net-costs.

4 Problems

1. During the early days of Covid-19, toilet papers were hard to come by. You shop at Costco all the time, so you happen to have some extra toilet papers that you are willing to sell. Three of your neighbors have expressed interests in buying toilet papers from you. The valuations for the toilet papers are as follows:

	You	Neighbor A	Neighbor B	Neighbor C
Valuation	\$20	\$10	\$30	\$50

Which of the following are Pareto improvements? Which are Kaldor-Hicks improvements?

(a) You sell your extra toilet papers to neighbor A at the price of \$30.

You are better off by $\$30 - \$20 = \$10$, and neighbor A is worse off by $|\$10 - \$30| = \$20$.

Since it makes neighbor A worse off, the transaction cannot be a Pareto improvement.

Together, the transaction changes the social surplus by $-\$20 + \$10 = -\$10$; the four-people society is now worse off, so it is not a K-H improvement either.

(b) You sell your extra toilet papers to neighbor B at the price of \$30.

The transaction makes you better off by $\$30 - \$20 = \$10$, while neighbor B is indifferent to the change.

The transaction leaves everyone at least as well off as before, hence it is a Pareto improvement.

Since it is a Pareto improvement, it automatically is a K-H improvement (everyone is made weakly better off, so the entire social welfare can only increase).

(c) You sell your extra toilet papers to neighbor B at the price of \$40. Neighbor B then sells the extra toilet papers to neighbor C at the price of \$45.

You gain $\$40 - \$20 = \$20$ from selling to Neighbor B.

Neighbor B's surplus changes by $\$30 - \$40 + \$45 - \$30 = \$5$ (buys from you at \$40, then resells at \$45), so Neighbor B eventually gains \$5.

Neighbor C gains $\$50 - \$45 = \$5$.

The transaction leaves everyone at least as well off as before, so it is a Pareto and a K-H improvement.

(d) You sell your extra toilet papers to neighbor C at the price of \$45. Neighbor C decided to pay you through getting cash advance from their credit card. As a result, neighbor C now needs to pay credit card company the cash advance interest fee \$10 to finish the transaction.

(When evaluating social welfare, focus on the welfare within this four-people society)

You gain $\$45 - \$20 = \$25$ from the transaction.

Neighbor C loses $|\$50 - \$45 - \$10| = \$5$ from the transaction.

Neighbor C loses, so the transaction is not a Pareto improvement.

But it is a K-H improvement since the total social welfare has changed by $\$25 - \$5 = \$20$, which is an increase in total social welfare.

2. Two students form a team to work on a class project. Each student could choose to either to work like crazy (W), or to slack off (S). The payoff table is as follows:

	S	W
S	1, 1	6, -1
W	-1, 6	2, 2

(a) Find the Nash equilibrium/equilibria.

The game is symmetric, and clearly slack off (S) is the dominant strategy for both players. Therefore, at the unique Nash equilibrium both players choose to slack off, and each player gets a payoff of 1. This is the classic case of the "prisoners' dilemma".

(b) Which outcomes are Pareto efficient? Which outcomes are Kaldor-Hicks efficient?

Outcomes (S, W) with payoffs (6, -1), (W, S) with payoffs (-1, 6), and (W, W) with payoffs (2, 2) are all Pareto efficient, since you cannot weakly increase the payoffs for both players by switching to another outcome. The only outcome that is not Pareto efficient is (S, S) with payoffs (1, 1), since it is Pareto dominated by (W, W).

Outcomes (S, W) with payoffs (6, -1) and (W, S) with payoffs (-1, 6) are K-H efficient, since each yields the largest total payoff $6 - 1 = 5$. Notice that (W, W) is not K-H efficient here. Thus, if you only care about total happiness of both students and somehow it is possible to allocate students in one set of actions, it is "better" to allow one student to slack off.

3. There are N cars in the city and two roads. From the perspective of each car user, it takes 105 minutes to traverse road A and $(5 + 20X)$ minutes to traverse road B, where X is the number of cars currently in the road.

   (a) What is the equilibrium number of cars on each road?

   Think of the equilibrium as a scenario where everyone is already optimizing, and no one is changing their actions without external changes to the environment.

   For any $X > 5$, it would take more time to drive on road B, and all the drivers would switch to road A and pushing X towards zero. Hence any $X > 5$ cannot constitute an equilibrium. Similarly, for any $X < 5$, it takes less time to drive on road B, and everyone would drive on road A, that is, $X = N$. Thus, any $X < 5$ cannot be an equilibrium either.

   The unique equilibrium is at $X = 5$, when travel time on both roads are the same, and every driver is indifferent between the roads. The total travel time for all N drivers is $105 * N$.

   (b) What is the Kaldor-Hicks efficient number of cars on each road? Is it Pareto efficient? Is it a Pareto improvement from the equilibrium outcome?

   The K-H efficient outcome would minimize the total travel time of all N drivers. In other words, a benevolent social planner would choose X to minimize

   $$X(5 + 20X) + 105(N - X)$$

   The first order condition is $40X - 100 = 0$, which gives us $X = 2.5$. The total travel time is now $2.5 * 55 + 105(N - 2.5) = 105N - 125$.

   Notice that the K-H efficient X is lower than equilibrium X. This is because each driver on road A generates a negative externality for other drivers on this road, so the social optimal quantity is lower than the quantity cause by each driver behaving rationally.

   Since $X = 2.5$ is K-H efficient, it must also be Pareto efficient. It is also a Pareto improvement from the equilibrium outcome, as 2.5 drivers now spend less time on road, while the rest of the drivers still spend 105 minutes and are indifferent to the change.