Rolling spools with wide and narrow hubs

Background

Two spools made of identical materials but constructed differently as shown are rolled down an incline. Which gets to the bottom first?

You will need...

- ✓ Four identical discs,
- ✓ six identical bolts,
- ✓ 18 nuts,
- ✓ a power drill and
- ✓ a spanner.

Follow these steps

1. Measure and mark, where the holes are needed in the discs. Drill the holes. Position the bolts. Tighten the nuts with the spanner.
2. Place the two spools at the top of an inclined ramp.
3. Release them simultaneously so that they roll down the ramp.

So what happened?

The spool with the bolts close to the centre reached the bottom of the ramp first.

What next?

Review the demonstration about falling meter sticks or hold a dumbbell in each hand and sit in a swivel chair (and wear a seat-belt). Then go for a spin with arms outstretched horizontally, and while still spinning bring your arms to the vertical with the dumbbells over your head. What do you notice? How does this relate to the rolling spools?