

Overview of vehicle database

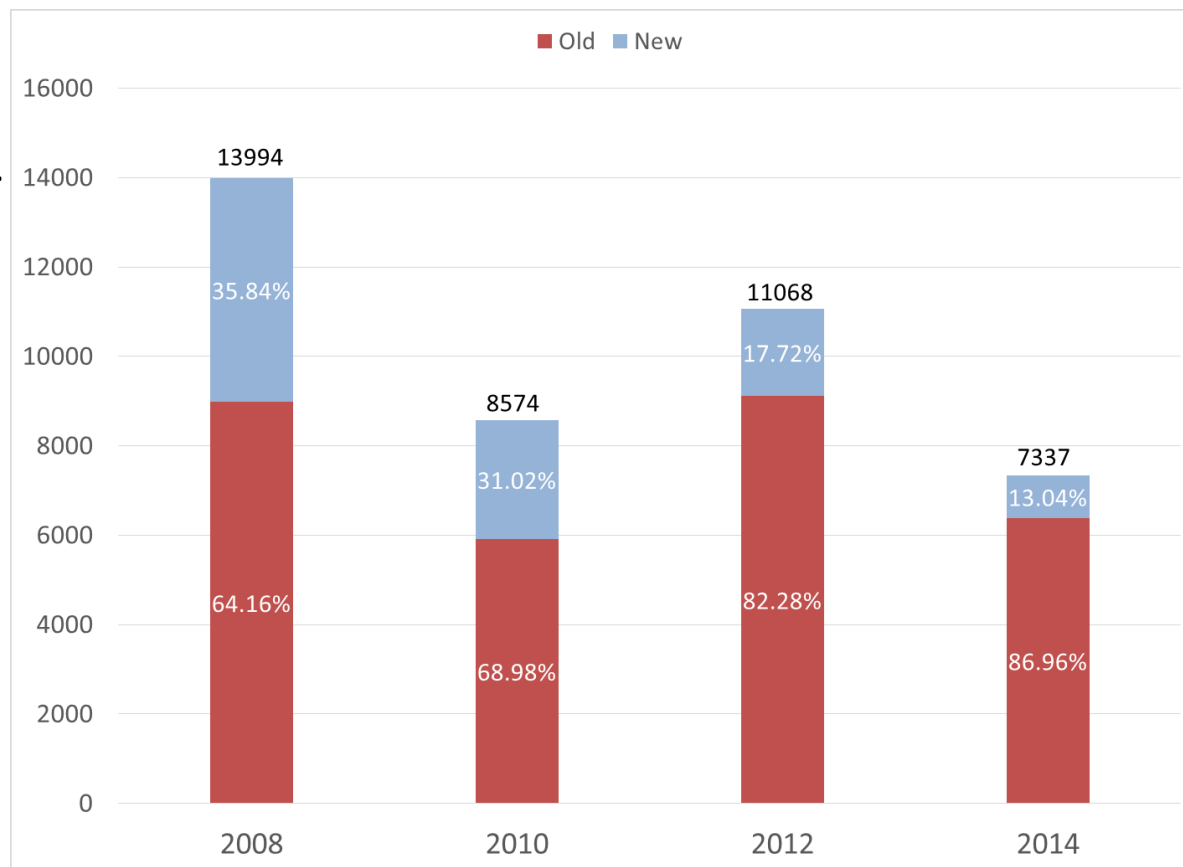
Partial data elaboration, analysis and identified problems

Contents

- Overview of vehicle number per year: 2008, 2010, 2012 i 2014
- Structure of vehicle brands per year
- Structure of vehicle age per year
- Structure of engine volume per year
- Structure of fuel used per year
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- Estimating average consumption and emissions

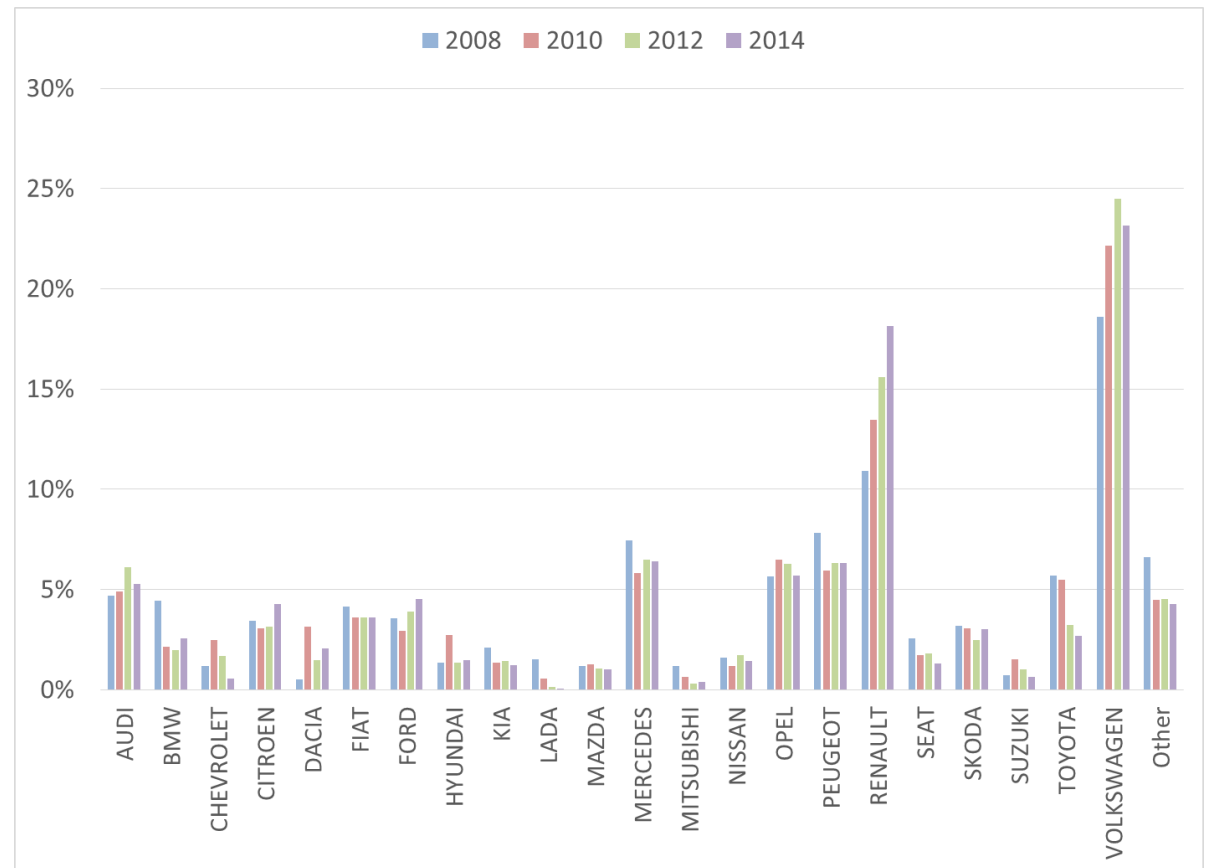
Overview of database...

- Number of vehicles (the first registration in 2008, 2010, 2012 and 2014)
 - It is evident a decreasing trend of vehicle number in period 2008-2014
 - 47.6 % decrease of vehicle number in 2014 with respect to 2008
 - The share of new cars is decreasing
 - From 35.84 % share in 2008 to 13.04 % share in 2014
 - The trend will lead to increase of old vehicles share in the total vehicle stock of Montenegro



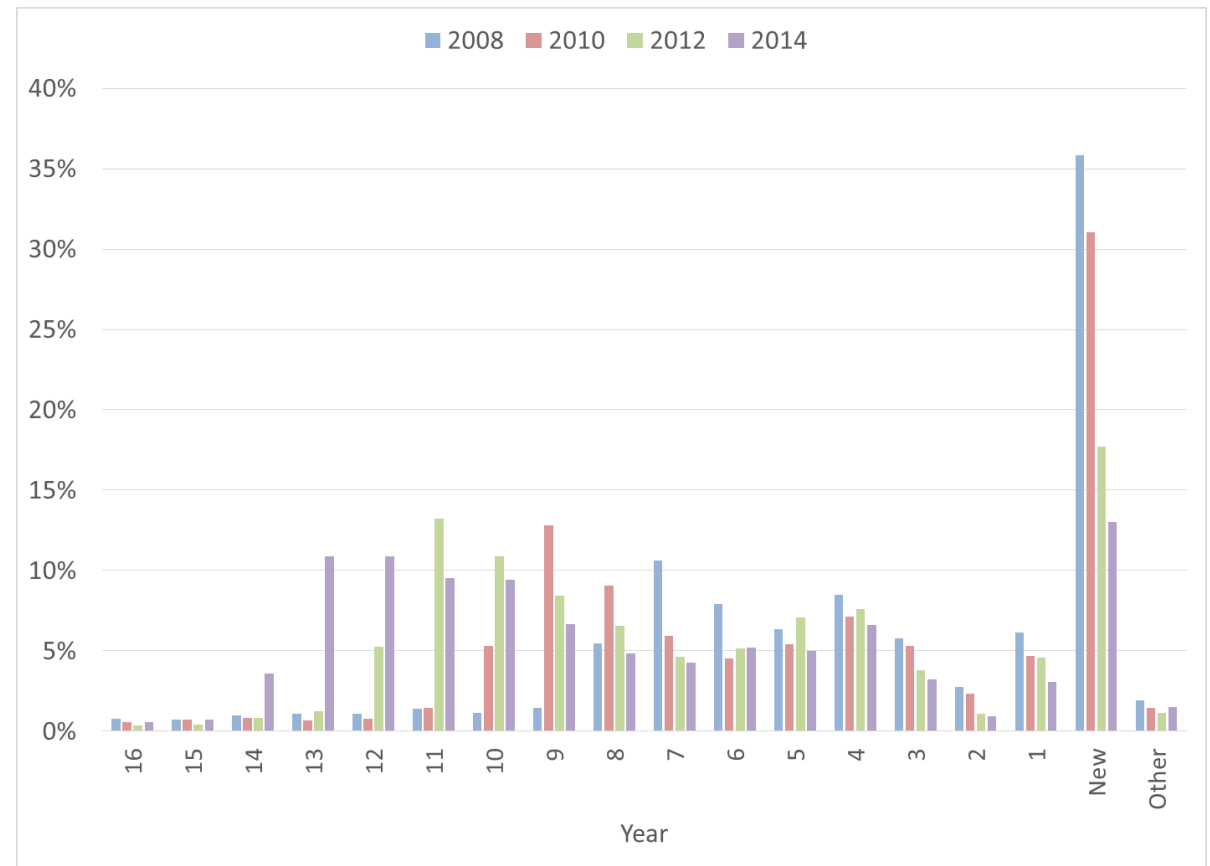
...Overview of database...

- Market share per vehicle brand
 - It is evident that 5 vehicle brands are dominant in whole period: Volkswagen, Renault, Peugeot, Mercedes and Opel with 50 % share.
 - Renault and Volkswagen are characterized by the increasing trend
 - Most of other brands rest at the same level during the observed period



...Overview of database...

- Age of vehicles
 - The most evident trend is the decrease of new cars share per year (3 times decreased in period 2008-2014)
 - Car stock is becoming older from 2008 to 2014 (high increase of the share of older cars in 2012 and 2014 – care older than 10 years)



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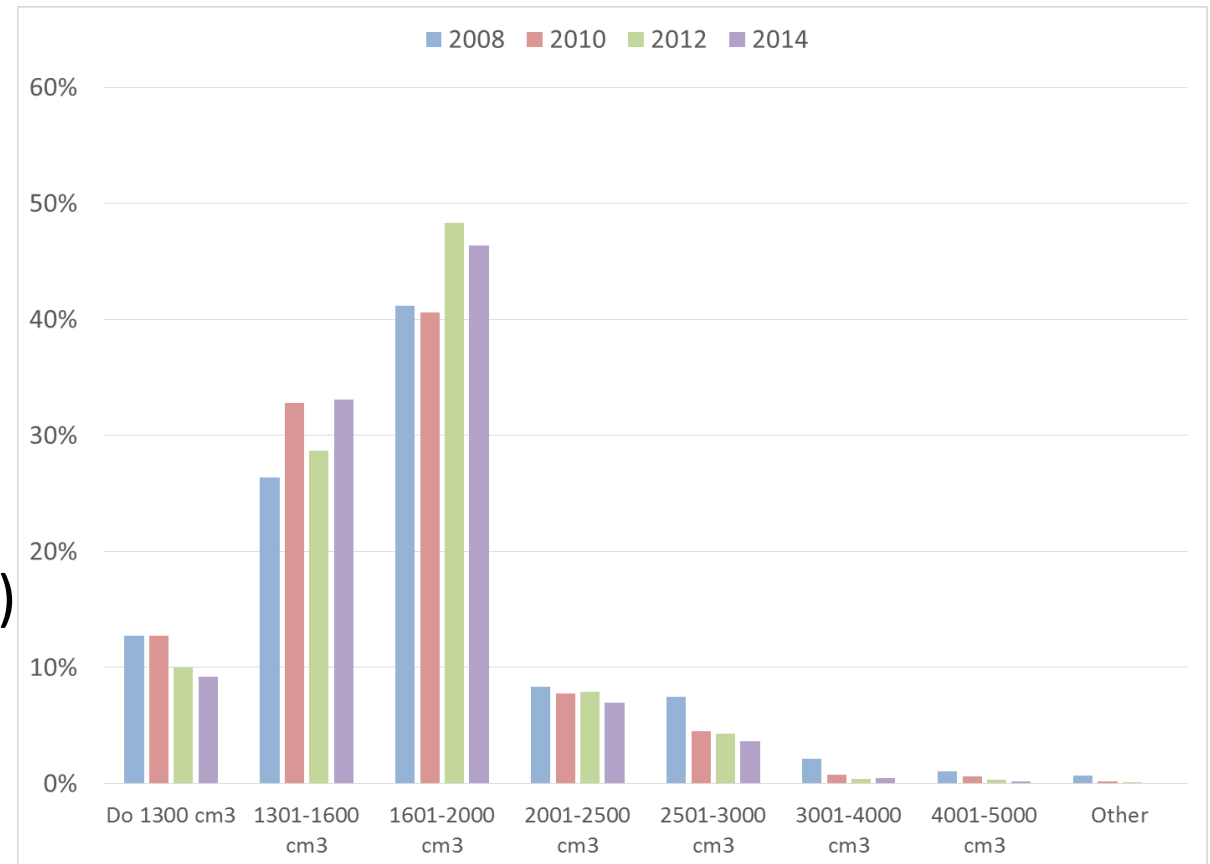
- Engine volume

- The greatest share corresponds to 2 volume classes:

- 1301-1600 cm³
- 1601-2000 cm³

- These engine volume classes are characterized with increasing trend with respect to all other classes

- High volume engines (>2500 cm³) share decreased from 10,6 % in 2008 to 4,35 % in 2014



...Overview of database...

- Structure of fuel used

- Evident diesel share increase
- Gasoline share decreased for about 60 % in period 2008-2014
- Very low usage of LPG and electricity powered vehicles



...Overview of database

- Problems with consistency
 - Ambiguity or absence of data regarding:
 - Brand name – solved (different typing errors, absence of data, different brand formulations etc.)
 - 2008 – 68 different vehicle brands
 - 2010 – 59 different vehicle brands
 - 2012 – 55 different vehicle brands
 - 2014 – 50 different vehicle brands
 - Model – The greatest problem – solving in progress (different typing errors, absence of data, different model formulations etc.)
 - 2008 – 3631 different vehicle models
 - 2010 – 2664 different vehicle models
 - 2012 – 2633 different vehicle models
 - 2014 – 1883 different vehicle models
 - Volume – Low impact (below 0.5 % of the total vehicle number)
 - Power – Low impact (below 0.5 % of the total vehicle number)
 - Registration year – Low impact (below 0.5 % of the total vehicle number)
 - Production year – Low impact (below 0.5 % of the total vehicle number)
 - Fuel – Low impact (below 0.5 % of the total vehicle number)

Estimating average consumption and emissions

- Data regarding consumption and emissions – problem to match the data for all types (solving in progress)
 - Absence of data for some vehicle brands, models, production year
 - Unable to make the exact match regarding vehicle model due to the lack of detailed model specification in Montenegrin vehicle database
- Possible solutions
 - Consulting vehicle producers and additional sources
 - Adopting average consumption and emission parameters taking into account the production year, engine volume, power and fuel
 - Removal of problematic vehicles and specifying their percentage share within the total number of cars per year