

Lampiran 2 Data Hasil Kuesioner

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Ya	Tidak	Ya	Ya	5	5	4	4	5	5	5	4	5	5	4	5	5	4	3	5	5	5	4	5	5	4	5	5	5	5	4	5	5	5	5	4	5	4	5	5	
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Ya	Tidak	Ya	Ya	4	5	3	5	4	5	3	2	5	3	4	5	5	4	5	5	4	3	5	5	5	4	2	5	5	5	4	5	5	5	3	5	4	5	2	4
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Ya	Tidak	Ya	Ya	5	3	4	5	5	4	4	5	1	3	4	5	4	5	5	3	5	3	5	5	4	4	4	5	5	4	4	5	2	5	4	5	4	4	5	4	
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Ya	Tidak	Ya	Ya	3	5	5	5	5	5	4	4	5	5	3	4	3	5	4	4	5	4	4	5	5	3	4	5	4	5	5	4	5	4	5	5	4	5	4	4	
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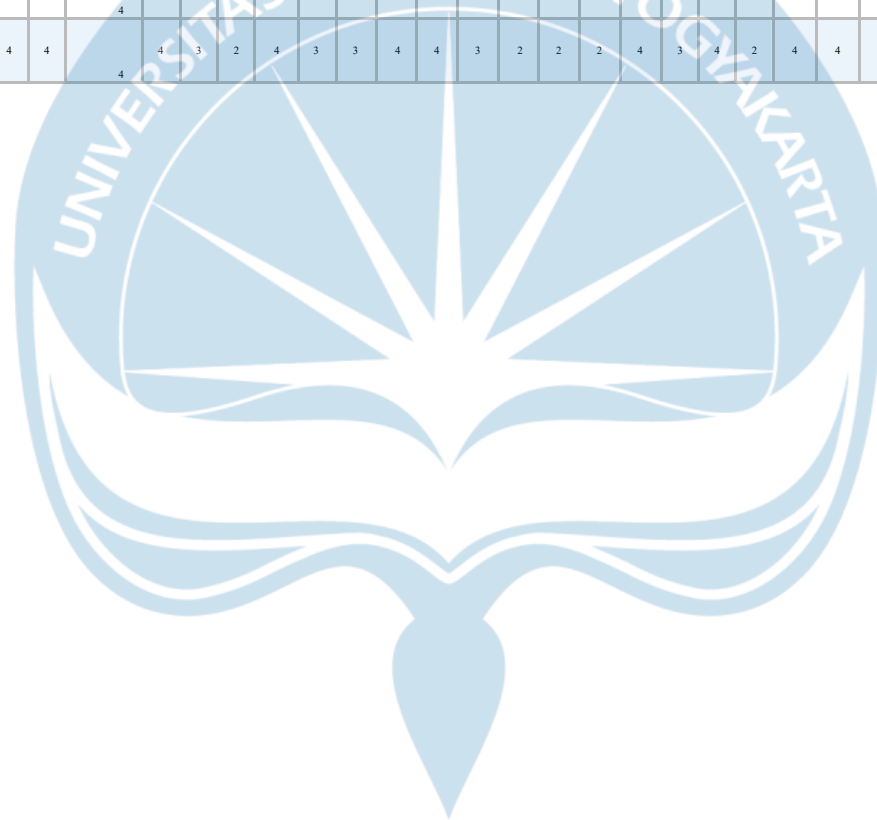
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Filter 1	Filter 2	Filter 3	Filter 4	D TF V1	D TF V2	D TF V3	D TF V4	CP 1	CP 2	CP 3	CP 4	PV 1	PV 2	PV 3	PV 4	IP 1	IP 2	IP 3	IP 4	SI 1	SI 2	SI 3	SI 4	SC 1	SC 2	SC 3	SC 4	IN E1	IN E2	IN E3	IN E4	GS I1	GS I2	GS I3	GS I4	SI A E1	SI A E2	SI A E3	SI A E4
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Ya	Tidak	Ya	Ya	5	4	5	4	5	5	4	4	4	4	5	4	5	5	4	3	5	5	5	4	5	5	5	4	5	4	5	5	5	4	5	5	4	5	5	4	4
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Ya	Tidak	Ya	Ya	5	5	4	5	5	5	3	4	4	3	5	4	4	5	5	5	3	3	4	5	4	4	4	5	5	4	4	5	5	5	4	4	5	5	5	5
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Filter 1	Filter 2	Filter 3	Filter 4	TFV1 D	TFV2 D	TFV3 D	TFV4 D	CP 1	CP 2	CP 3	CP 4	PV 1	PV 2	PV 3	PV 4	IP 1	IP 2	IP 3	IP 4	SI 1	SI 2	SI 3	SI 4	SC 1	SC 2	SC 3	SC 4	E1 IN	E2 IN	E3 IN	E4 IN	GSI1	GSI2	GSI3	GSI4	E1 SI ^A	E2 SI ^A	E3 SI ^A	E4 SI ^A
Ya	Tidak	Ya	Ya	4	4	4	4	5	5	5	5	5	5	5	5	5	5	5	3	3	4	5	4	4	4	4	4	2	2	2	2	4	4	4	5	5	5	5	5
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No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
1	Lakilaki	Sarjana (S1)	Mahasiswa	> Rp15.000.000		Mobil berbahan bakar bensin/diesel
	Perempuan	Sarjana (S1)	Wirusaha	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
2		Sarjana (S1)	Mahasiswa	>	Ya	Sepeda motor berbahan bakar bensin
		SMA/Sederajat	Mahasiswa		Ya	Mobil berbahan bakar bensin/diesel
3	Lakilaki			Rp3.000.000	Ya	Mobil berbahan bakar bensin/diesel
				Rp6.000.001 - Rp9.000.000		Mobil berbahan bakar bensin/diesel
4	Lakilaki	SMA/Sederajat	Pegawai Swasta	> Rp15.000.000	Ya	Sepeda motor berbahan bakar bensin
	Lakilaki	Sarjana (S1)	Pegawai Swasta	>	Ya	Mobil berbahan bakar bensin/diesel

	Lakilaki			Rp3.000.000		
7	Lakilaki	SMA/Sederajat	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
8	Lakilaki	SMA/Sederajat	Wirasaha	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
9	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
10	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	bakar bensin Sepeda motor berbahan bakar bensin
11	Lakilaki	Sarjana (S1)	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
12		Sarjana	Mahasiswa	Rp3.000.001 -	Ya	Sepeda motor berbahan bakar bensin

	Lakilaki	(S1)		Rp6.000.000		
13	Lakilaki	Diploma	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
14	Perempuan	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
15	Lakilaki	SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
16	Lakilaki	SMA/Sederajat	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
17	Lakilaki	SMA/Sederajat	Ibu Rumah Tangga	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
18	Perempuan	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin

19	empua n Lakilaki	SMA/Sede raja	Maha- siswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/die sel
20	Lakilaki	SMA/Sede raja	Maha- siswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
21	Per- empua n	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
22	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
23	Lakilaki	Sarjana (S1)	Lainnya	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/die sel
24	Lakilaki	Sarjana (S1)	Maha- siswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
25	Per- empua n	SMA/Sede	Pegawai	Rp3.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/die sel

26	rajaat	Swasta			Mobil berbahan bakar
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No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
27	Lakilaki	SMA/Sede rajaat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
28	Lakilaki	Sarjana (S1)	Maha- siswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
29	Per- empua n	SMA/Sede rajaat	Maha- siswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
30	Lakilaki	SMA/Sede rajaat	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
31		Sarjana (S1)	Pegawai Negeri	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
				Rp3.000.001 -		

32	Lakilaki	Sarjana (S1)	Lainnya	Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
	Perempuan			Rp6.000.001 - Rp9.000.000		
33	Lakilaki	Sarjana (S1)	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
34		Sarjana (S1)	Mahasiswa		Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
35	Perempuan	Diploma	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
	Lakilaki			Rp9.000.001 - Rp12.000.000		
36		SMA/Sederajat	Mahasiswa		Ya	Sepeda motor berbahan bakar bensin
	Perempuan	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
37						

38	Per-empua n	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
39	Per-empua n	Sarjana (S1)	Maha- siswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
40	Per-empua n	Sarjana (S1)	Maha- siswa	< Rp3.000.000	Tidak	Sepeda motor berbahan bakar bensin
41		SMA/Sede raja	Pegawai Swasta		Ya	Sepeda motor berbahan bakar bensin
42	Lakilaki	Sarjana (S1)	Maha- siswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
43	Lakilaki	SMA/Sede raja	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilika n Ken- daraan	Jenis Kendaraan
						bakar bensin

44	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
45	Lakilaki	SMA/Sederajat	Mahasiswa	Rp9.000.001 - Rp12.000.000	Ya	Mobil berbahan bakar bensin/diesel
46	Perempuan	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Mobil berbahan bakar bensin/diesel
47	Lakilaki	Sarjana (S1)	Wirasaha	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin
48	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
49	Lakilaki	Diploma	Pegawai Swasta	Rp3.000.001 - Rp9.000.001	Ya	Sepeda motor berbahan bakar bensin
50	Lakilaki	Pasca Sarjana (S2)	Mahasiswa	Rp9.000.001 - Rp12.000.000	Ya	Mobil berbahan bakar bensin/diesel

51		Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
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No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
52	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
53	Lakilaki	Sarjana (S1)	Mahasiswa	Rp9.000.001 - Rp12.000.000	Ya	Mobil berbahan bakar bensin/diesel
54	Pempuan	SMA/Sederajat	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
55	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
56		Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel

57	Lakilaki			Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
	Lakilaki	SMA/Sederajat	Mahasiswa	< Rp3.000.000		
58	Lakilaki	Diploma			Ya	Sepeda motor berbahan bakar bensin
			Mahasiswa	Rp3.000.001 - Rp6.000.000		
59	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
60		Sarjana (S1)	Mahasiswa		Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
61	Lakilaki			Rp3.000.001 - Rp6.000.000	Ya	bakar bensin
	Perempuan	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000		Sepeda motor berbahan bakar bensin
62		Sarjana (S1)	Pegawai Swasta		Ya	Sepeda motor berbahan bakar bensin

63	Lakilaki	SMA/Sederajat	Mahasiswa	< Rp3.000.000		Sepeda motor berbahan bakar bensin
64	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
65	Perempuan	Diploma	Pegawai Swasta	Rp9.000.001 - Rp12.000.000	Ya	Sepeda motor berbahan bakar bensin
66	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
67	Perempuan	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
68		Sarjana (S1)	Pegawai Swasta		Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
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69	Lakilaki	Sarjana (S1)	Maha-siswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
70	Lakilaki	Sarjana (S1)	Maha-siswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
71	Per-empua n	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
72	Lakilaki	SMA/Sede rajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
73	Lakilaki	SMA/Sede rajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
74	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
75	Lakilaki	Sarjana (S1)	Maha-siswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel

76	Lakilaki	SMA/Sederajat	Wirausaha	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin
77	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
78	Perempuan	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	bakar bensin Sepeda motor berbahan bakar bensin
79	Perempuan	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
80	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
81	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin

82	Perempuan	SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
83	Lakilaki	Sarjana (S1)	Mahasiswa	Rp9.000.001 - Rp12.000.000	Ya	Mobil berbahan bakar bensin/diesel
84	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin
85	Perempuan	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
86	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
87	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Mobil berbahan bakar bensin/diesel

88	Lakilaki	Sarjana (S1)	Maha-siswa	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
89	Lakilaki	SMA/Sederajat	Maha-siswa	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
90	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
91	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
92	Lakilaki	Sarjana (S1)	Maha-siswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
93	Lakilaki	SMA/Sederajat	Maha-siswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
94	Pemua	SMA/Sederajat	Maha-siswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
95	Lakilaki	Diploma	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	bakar bensin Sepeda motor berbahan bakar bensin
96	Lakilaki	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
97	Lakilaki	Diploma	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
98	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
99	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
100		Sarjana (S1)	Mahasiswa	Rp3.000.001 -	Ya	Sepeda motor berbahan bakar bensin

	Lakilaki			Rp6.000.000		
101	Perempuan	SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin
102		Sarjana (S1)	Pegawai Swasta		Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
103	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
104	Lakilaki	SMA/Sederajat	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
105	Lakilaki	Sarjana (S1)	Mahasiswa	Rp6.000.001 - Rp9.000.000		
	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
106		Sarjana (S1)	Pegawai Swasta	<	Ya	Sepeda motor berbahan bakar bensin

	Lakilaki			Rp3.000.000		
107	Lakilaki	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
108	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
109		Sarjana (S1)	Mahasiswa		Ya	Mobil berbahan bakar bensin/diesel
110	Lakilaki	Diploma	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
111	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
112		Pasca Sarjana (S3)	Pegawai Swasta	> Rp15.000.00	Ya	bakar bensin Mobil berbahan bakar bensin/diesel

	Lakilaki			0		
113	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
114	Perempuan	SMA/Sederajat	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
115	Lakilaki	Sarjana (S1)	Mahasiswa	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
116	Lakilaki	Diploma	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
117	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
118	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
119	Lakilaki	SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Tidak	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
120	Perempuan	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
121	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
122	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
123	Perempuan	SMA/Sederajat	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
124	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
125		Sarjana (S1)	Mahasiswa	Rp3.000.001	Ya	Mobil berbahan bakar bensin/diesel

	Lakilaki	Sarjana (S1)		- Rp6.000.000		
126	Lakilaki		Pegawai Negeri	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
127	Lakilaki	SMA/Sederajat	Mahasiswa	Rp6.000.001 - Rp9.000.000	Tidak	Sepeda motor berbahan bakar bensin
128		SMA/Sederajat	Mahasiswa		Ya	Mobil berbahan bakar

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
						bensin/diesel
129	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
130	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Mobil berbahan bakar bensin/diesel
131	Lakilaki	Sarjana (S1)	Mahasiswa	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin

	Lakilaki			- Rp6.000.000		
13 2	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
13 3	Lakilaki	Sarjana (S1)	Maha- siswa	Rp9.000.001 - Rp12.000.000	Ya	Sepeda motor berbahan bakar bensin
13 4	Per- empua n	SMA/Sede raja	Maha- siswa	< Rp3.000.000	Ya	Mobil berbahan bakar bensin/die sel
13 5	Per- empua n	SMA/Sede raja	Maha- siswa	Rp6.000.001 - Rp9.000.000	Ya	Sepeda motor berbahan bakar bensin
13 6		Sarjana (S1)	Pegawai Swasta		Ya	Sepeda motor berbahan bakar bensin

No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilika n Ken - daraan	Jenis Kendaraan
13 7	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin

138	Lakilaki	SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
139	Lakilaki	Sarjana (S1)	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
140	Lakilaki	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	Sepeda motor berbahan bakar bensin
141	Lakilaki	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
142	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
143		SMA/Sederajat	Wirusaha		Ya	Mobil berbahan bakar bensin/diesel

144	Perempuan	SMA/Sederajat	Pegawai Swasta	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
145	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar
No	Jenis Kelamin	Tingkat Pendidikan	Pekerjaan	Pendapatan Rata-rata	Kepemilikan Kendaraan	Jenis Kendaraan
146	Lakilaki	Sarjana (S1)	Pegawai Swasta	< Rp3.000.000	Ya	bensin/diesel
147		SMA/Sederajat	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
148	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Sepeda motor berbahan bakar bensin
149		SMA/Sederajat	Pegawai Negeri	Rp6.000.001 -	Ya	Mobil berbahan bakar bensin/diesel
148	Lakilaki	Sarjana (S1)	Mahasiswa	Rp3.000.001 - Rp6.000.000	Ya	Mobil berbahan bakar bensin/diesel
149		SMA/Sederajat	Pegawai Negeri	Rp6.000.001 -	Ya	Mobil berbahan bakar bensin/diesel

	Lakilaki			Rp9.000.000		
				Rp6.000.001 -		
	Lakilaki			Rp9.000.000		
15 0	Lakilaki	Sarjana (S1)	Maha- siswa		Ya	Mobil berbahan bakar bensin/die sel
15 1	Lakilaki	Sarjana (S1)	Maha- siswa	Rp3.000.001 -	Ya	Mobil berbahan bakar bensin/die sel
				Rp6.000.000		

Sumber: Data primer diolah peneliti (2026) Lampiran 3 Screenshoot Hasil SmartPLS

Outer loadings - Matrix								
	Cost Pressure	Dissatisfacti...	Green Self I...	Incentive Pol...	Inertia	Perceived Va...	Social Infl...	Switching ...
CP2	0.776							
CP4	0.742							
DTFV1		0.712						
DTFV2		0.744						
DTFV3		0.815						
GS11			0.854					
GS12			0.818					
INE1					0.821			
INE2					0.706			
INE3					0.822			
INE4					0.707			
IP1				0.822				
IP2				0.819				
PV1						0.746		
PV2						0.832		
SC1								0.834
SC3								0.786
SC4								0.725

Outer loadings - Matrix													Copy to Excel/Word	Copy to R
	ve Pol...	Inertia	Pe...	Social...	Switching ...	Switc...	Gree...	Gree...	Gree...	Gree...	Gree...	Gree...		
SC1					0.834									
SC3					0.786									
SC4					0.725									
SI1				0.781										
SI2				0.841										
SI3				0.674										
SIAE1						0.741								
SIAE2						0.818								
SIAE3						0.695								
Green Self Identity x Cost Pressure							1.000							
Green Self Identity x Dissatisfaction with Traditional Fuel Vehicles												1.000		
Green Self Identity x Incentive Policy												1.000		
Green Self Identity x Inertia												1.000		
Green Self Identity x Perceived Value												1.000		
Green Self Identity x Social Influence												1.000		
Green Self Identity x Switching Costs													1.000	

Validitas dan reliabilitas konstruk - Ringkasan				
	Cronbach's alpha	Keandalan komposit (rho_a)	Keandalan komposit (rho_c)	Rata-rata varians diekstraksi (...)
Cost Pressure	0.742	0.768	0.823	0.742
Dissatisfaction with Traditional...	0.783	0.805	0.857	0.761
Green Self Identity	0.761	0.788	0.839	0.732
Incentive Policy	0.715	0.736	0.791	0.718
Inertia	0.804	0.826	0.871	0.755
Perceived Value	0.738	0.759	0.812	0.721
Social Influence	0.764	0.785	0.843	0.734
Switching Costs	0.792	0.813	0.862	0.759
Switching Intention to adopt EV	0.753	0.773	0.831	0.728

Discriminant validity - Heterotrait-monotrait ratio (HTMT) - Matrix															Copy to Excel/Word	Copy to R
	Cost ...	Dissat...	Green ...	Incen...	Iner...	Perc...	Social ...	Switc...	Switc...	Green ...	Gree...	Gree...	Gree...	Gree...		
Cost Pressure																
Dissatisfaction with Traditional Fuel Vehicles	0.966															
Green Self Identity	0.917	0.994														
Incentive Policy	0.971	0.761	0.884													
Inertia	0.452	0.503	0.461	0.286												
Perceived Value	0.867	1.145	1.117	0.912	0.282											
Social Influence	0.854	0.888	0.776	0.599	0.476	1.093										
Switching Costs	0.628	0.648	0.474	0.299	0.533	0.577	0.554									
Switching Intention to adopt EV	0.971	0.942	0.819	0.765	0.434	1.058	0.800	0.664								
Green Self Identity x Cost Pressure	0.336	0.306	0.342	0.254	0.101	0.220	0.290	0.071	0.297							
Green Self Identity x Social Influence	0.413	0.378	0.335	0.224	0.081	0.412	0.420	0.074	0.301	0.549						
Green Self Identity x Perceived Value	0.265	0.334	0.281	0.158	0.170	0.589	0.376	0.038	0.343	0.419	0.730					
Green Self Identity x Incentive Policy	0.389	0.219	0.197	0.424	0.077	0.192	0.241	0.067	0.156	0.582	0.611	0.456				
Green Self Identity x Inertia	0.225	0.095	0.131	0.099	0.141	0.273	0.071	0.042	0.215	0.002	0.137	0.081	0.237			
Green Self Identity x Dissatisfaction with Traditional Fuel Vehicles	0.455	0.431	0.380	0.218	0.100	0.399	0.396	0.033	0.299	0.552	0.772	0.687	0.606	0.219		
Green Self Identity x Switching Costs	0.068	0.027	0.084	0.053	0.110	0.093	0.099	0.072	0.103	0.178	0.228	0.138	0.249	0.469	0.266	

Discriminant validity - Fornell-Larcker criterion										Copy to Excel/Word	Copy to R
	Cost Pres...	Dissatisfac...	Green S...	Incentiv...	Inertia	Perceiv...	Social In...	Switching Costs	Switching Intenti...		
Cost Pressure	0.759										
Dissatisfaction with Traditional...	0.408	0.758									
Green Self Identity	0.358	0.591	0.836								
Incentive Policy	0.361	0.430	0.475	0.821							
Inertia	0.193	0.356	0.309	0.170	0.766						
Perceived Value	0.291	0.593	0.535	0.409	0.171	0.790					
Social Influence	0.346	0.586	0.477	0.344	0.339	0.569	0.768				
Switching Costs	0.254	0.431	0.301	0.185	0.387	0.326	0.389	0.783			
Switching Intention to adopt EV	0.397	0.611	0.507	0.442	0.302	0.544	0.529	0.450	0.753		

R-square - Overview

	R-square	R-square adjusted
Switching Intention to adopt EV	0.552	0.503

f-square - Matrix

	Switching Intention to adopt EV
Cost Pressure	0.027
Dissatisfaction with Traditional Fuel Vehicles	0.038
Green Self Identity	0.001
Incentive Policy	0.046
Inertia	0.013
Perceived Value	0.024
Social Influence	0.009
Switching Costs	0.043
Switching Intention to adopt EV	
Green Self Identity x Cost Pressure	0.043
Green Self Identity x Social Influence	0.005
Green Self Identity x Perceived Value	0.050
Green Self Identity x Incentive Policy	0.027
Green Self Identity x Inertia	0.034
Green Self Identity x Dissatisfaction with Traditional Fuel Vehicles	0.008
Green Self Identity x Switching Costs	0.000

PLSpredict LV summary - PLS-SEM

	Q ² predict
Switching Intention to adopt EV	0.322

Path coefficients - Mean, STDEV, T values, p values

	Original s...	Sample m...	Standard de...	T statistics (...	P values
Cost Pressure -> Switching Intention to adopt EV	0.129	0.123	0.075	1.712	0.087
Dissatisfaction with Traditional Fuel Vehicles -> Switching Intention to adopt EV	0.204	0.191	0.089	2.286	0.022
Green Self Identity -> Switching Intention to adopt EV	0.029	0.053	0.091	0.322	0.748
Green Self Identity x Cost Pressure -> Switching Intention to adopt EV	-0.161	-0.154	0.081	1.975	0.048
Green Self Identity x Dissatisfaction with Traditional Fuel Vehicles -> Switching Intention to adopt EV	0.088	0.061	0.107	0.830	0.407
Green Self Identity x Incentive Policy -> Switching Intention to adopt EV	0.151	0.147	0.078	1.943	0.052
Green Self Identity x Inertia -> Switching Intention to adopt EV	-0.174	-0.164	0.102	1.701	0.089
Green Self Identity x Perceived Value -> Switching Intention to adopt EV	-0.222	-0.199	0.099	2.241	0.025
Green Self Identity x Social Influence -> Switching Intention to adopt EV	0.065	0.042	0.125	0.520	0.603
Green Self Identity x Switching Costs -> Switching Intention to adopt EV	0.003	0.033	0.092	0.036	0.972
Incentive Policy -> Switching Intention to adopt EV	0.184	0.184	0.077	2.390	0.017
Inertia -> Switching Intention to adopt EV	0.092	0.091	0.085	1.080	0.280
Perceived Value -> Switching Intention to adopt EV	0.151	0.132	0.093	1.627	0.104
Social Influence -> Switching Intention to adopt EV	0.087	0.106	0.094	0.928	0.354
Switching Costs -> Switching Intention to adopt EV	-0.169	-0.165	0.073	2.318	0.020

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Determinants of switching intention to adopt electric vehicles: A comparative analysis of China and Malaysia

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ABSTRACT

This study investigates the factors influencing the intention to switch to electric vehicles (EVs) in China and Malaysia, highlighting the countries' different cultural contexts. Data were collected through a questionnaire survey, resulting in valid responses from 696 Chinese and 648 Malaysian participants. The study employs partial least squares structural equation modeling (PLS-SEM) and multi-group analysis (MGA) within the framework of the push-pull-mooring model, incorporating key factors such as dissatisfaction with traditional fuel vehicles, cost pressure, perceived value, incentive policies, social influence, switching costs, and inertia. The findings reveal that dissatisfaction with traditional vehicles and cost pressure positively influence switching intention in both countries, with cost pressure having a stronger effect in China. Perceived value and incentive policies are also positively related to switching intention across both countries. Social influence is more prominent in China, while inertia has a stronger negative impact on switching intention in Malaysia. Switching costs significantly hinder EV adoption in both countries, with a greater barrier in China. Furthermore, green self-identity played a stronger moderating role in Malaysia for the effects of dissatisfaction with traditional vehicles and incentive policies on switching intention, reflecting a higher sensitivity among environmentally conscious Malaysian consumers. In contrast, green self-identity positively moderates the impact of social influence on switching intention in China, but not in Malaysia, highlighting the stronger role of social dynamics in shaping environmentally motivated decisions in China. This study contributes to the growing body of literature on EV adoption by providing cross-national insights and offering practical implications for policymakers and industry stakeholders aiming to promote sustainable mobility.

1. Introduction

The worldwide shift toward sustainable transportation has positioned electric vehicles (EVs) as a leading, eco-friendly alternative to traditional fuel-powered cars (Tamakloe & Caesar, 2024; Wang et al., 2024). This transition is driven by concerns over environmental degradation, advancements in technology, and governmental efforts to reduce carbon emissions (Hu et al., 2023; Mehrzadeh & Klockner, 2024). In 2023, transportation, largely dependent on internal combustion engines (ICEs), generated around 8.4 billion metric tons of CO₂ equivalent, representing 16 % of worldwide greenhouse gas emissions and ranking as the second-largest emission source globally (Statista Research Department, 2024).

Many developed economies have already introduced policies aimed at phasing out traditional vehicles that run on fossil fuels (Gehlmann et al., 2024; Ilahi et al., 2024; Luder et al., 2024). However, despite the numerous advantages of EVs, their market penetration and adoption rates remain relatively stagnant, particularly in developing economies (Upadhyay & Kamble, 2023). The situation is especially concerning in these regions, as the Asia-Pacific region surpassed North America in 2022, becoming the largest contributor to global transportation-related carbon emissions, driven by economic growth (Tiseo, 2023).

To address these environmental challenges, China and Malaysia, two key markets in Asia, are making efforts to promote EV adoption (Vafaei-Zadeh et al., 2022; Wang et al., 2021). The swift economic expansion in both countries has resulted in higher levels of vehicle

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ownership, which in turn has worsened urban pollution and environmental concerns (Asadi et al., 2021; Kushwah et al., 2024; Tan et al., 2022). As the largest EV market globally, China benefits from substantial government incentives and a robust manufacturing sector, and it is expected to manufacture approximately 13 million battery and plug-in hybrid EVs by 2023—exceeding the total production of other major markets such as the United States, Germany, and Japan (Carlier, 2024). In contrast, Malaysia's EV adoption has been slower due to its developing economy; however, in 2023, more than 10,000 EVs were sold, up by 7,500 units from the prior year (Siddharta, 2024). This upward trend is likely to persist, especially with government tax exemptions on EV import and excise duties extended through 2024 (Siddharta, 2024). In addition to economic differences, cultural contrasts between China and Malaysia are also prominent, as highlighted by Hofstede Insights (2024). China has a high long-term orientation score of 77, whereas Malaysia presents a contrasting score of 47.

The selection of China and Malaysia as focal countries in this study is driven by their distinct EV adoption trajectories and market dynamics. China, as the world's largest EV market, has implemented extensive government incentives and infrastructure investments, creating a mature EV ecosystem (Carlier, 2024; Yuan et al., 2024). In contrast, Malaysia represents an emerging market where EV adoption is in its early stages, largely shaped by government policies and consumer awareness (Adnan et al., 2017; Khan et al., 2024). A comparison between these two countries provides a unique opportunity to examine how economic, policy, and cultural differences influence consumer switching intentions. Additionally, China and Malaysia exhibit contrasting regulatory frameworks, infrastructure readiness, and consumer attitudes towards EVs, making them ideal candidates for a comparative study. While other nations with similar or contrasting EV adoption trends could have been included, focusing on these two countries allows for an in-depth analysis of EV transition factors within the Asian context, facilitating clearer policy recommendations for both developed and emerging EV markets.

To encourage more widespread EV adoption, it is essential to identify the factors influencing consumer choices, both positive and negative (Nguyen et al., 2024). Although research in this field is expanding, several gaps remain. First, much of the existing literature of EVs relies on theoretical models such as the diffusion of innovations theory, theory of planned behavior, technology acceptance model, unified theory of acceptance and use of technology, and value-belief-norm theory (Rezvani et al., 2015; Singh et al., 2020; Yu et al., 2025). While these models focus on psychological factors influencing EV adoption, they often overlook perceptions related to the vehicles consumers currently use. Second, while the push-pull-mooring (PPM) model has been utilized in prior research including mobile communication applications (Sun et al., 2017), airline industry (Jung et al., 2017), halal cosmetic products (Ab-Banna & Jannah, 2022), medical mobile payment (Hach, 2021), green transportation (S. Wang, Wang, & Yang, 2020), relatively few studies have applied it specifically to the context of switching from traditional fuel-powered vehicles to EVs. This research seeks to address this gap by examining how push, pull, and mooring factors impact consumer decisions in the EV transition. This model effectively identifies both driving and restraining forces in consumer decision-making processes (Nguyen et al., 2024). Push factors, such as dissatisfaction with conventional vehicles due to rising fuel costs and the increasing expense of petrol, prompt consumers to seek alternatives (Hu et al., 2023a; Jung et al., 2017). Pull factors, including the perceived benefits of EVs—such as perceived value, government incentives, and social influence—encourage consumers to make the switch (Nguyen et al., 2024). Mooring factors, such as switching costs and individual inertia, can inhibit or delay this transition (S. Wang, Wang, & Yang, 2020). Finally, although extensive research exists on EV adoption in developed countries, the literature remains scarce in emerging markets like China and Malaysia, especially regarding comparative consumer behavior in these regions. China, with its strong government incentives and robust EV

market (Wang et al., 2021), presents a sharp contrast to Malaysia, where the market is still nascent, and government incentives are more limited (Asadi et al., 2021). This study utilizes the PPM framework to perform a comparative analysis of EV adoption in China and Malaysia, focusing on the main factors affecting switching intentions and examining green self-identity as a moderating influence.

This research seeks to address this gap by examining how push factors, such as dissatisfaction with traditional fuel vehicles and cost pressure, pull factors like perceived value, incentive policies, and social influence, as well as mooring factors like switching costs and inertia, affect the intention to switch to EVs in China and Malaysia. In particular, it will evaluate green self-identity as a moderator, which has been studied in relation to EV adoption. Hence, the research is guided by the following questions.

RQ1: What are the key push, pull, and mooring factors that influence consumers' switching intention to adopt EVs in China and Malaysia?

RQ2: How do these factors differ between the two countries, and what cultural, economic, or policy differences explain these variations?

RQ3: How does green self-identity moderate the relationship between these factors and switching intention?

To explore these questions, a comparative analysis will be performed using data gathered from consumers in China and Malaysia. The proposed hypotheses will be tested through structural equation modeling (SEM), and the moderating role of green self-identity will be analyzed using multi-group analysis (MGA). This study's results will enhance the body of knowledge on sustainable transportation and consumer behavior by offering an understanding of the factors that encourage or impede EV adoption across different national settings. The comparative approach of this study allows for a deeper understanding of how country-specific factors, such as government policies and social influence, shape consumer behavior. Additionally, the introduction of green self-identity as a moderator provides new insights into how personal environmental values affect switching decisions. Policymakers and practitioners can use these findings to tailor strategies that promote EV adoption in both developed and emerging markets.

The remainder of this paper is organized as follows. Section 2 provides an overview of the literature on factors affecting EV adoption, focusing on the PPM framework and green self-identity. Section 3 describes the research approach, covering data collection and analytical methods. Section 4 presents the outcomes of the qualitative analysis. Section 5 offers a comparative discussion of the findings between China and Malaysia. Lastly, Sections 6, 7, and 8 conclude with insights for policy, study limitations, and suggestions for future research.

2. Literature review and research hypotheses

2.1. Electric vehicles in China and Malaysia

The worldwide automotive industry has experienced a major transition to EVs driven by rising concerns over climate impacts, environmental sustainability, and energy security (Cao et al., 2021). Governments around the globe have started encouraging EV uptake with incentives and policies focused on cutting carbon emissions and reducing reliance on fossil fuels (Qadir et al., 2024). Nevertheless, adoption rates differ across regions, shaped by unique economic, social, and cultural influences. In the context of China and Malaysia, both nations are in different stages of EV adoption and face unique challenges and opportunities.

China is a promising EV market in the world, driven by strong governmental support, including policies, subsidies, and incentives aimed at promoting the development and uptake of EVs (Liu et al., 2021; Zhao et al., 2024). The Chinese government's commitment to reducing air pollution and transitioning to a low-carbon economy has been a key

motivator behind the nation's EV expansion. The *Made in China 2025* strategy and the National Development and Reform Commission's initiatives have further catalyzed the country's shift towards sustainable transportation (Akkemik & Yillek, 2020; J. Wang, Wang, & Yang, 2020). Several studies have emphasized the influence of government incentives on EV adoption in China (Qian et al., 2019; Shi et al., 2023). Wang et al. (2017) revealed that consumer preferences for EVs in China are largely driven by the availability of government subsidies, tax exemptions, and the growing public awareness of environmental issues. Additionally, the role of charging infrastructure, which has significantly improved in China, making EV ownership more convenient and attractive, was emphasized (Zheng et al., 2022).

China's emphasis on EV manufacturing has also positioned it as a global frontrunner in producing BEVs and PHEVs. China is making substantial investments in EVs to support sustainable transportation, driven by their reduced emissions and high energy efficiency. In 2021, China led the world in EV production, reaching 3.5 million units—a 1.6-fold increase from the prior year. It also achieved the highest rating in Roland Berger's e-mobility index and generated the largest EV market revenues in the Asia-Pacific region, totaling 102.2 billion U.S. dollars (Zhang, 2024). Despite these advancements, China's EV market still faces challenges. While large urban centers such as Beijing and Shanghai have widely adopted EVs, rural areas lag behind due to limited charging infrastructure and lower awareness of EV benefits (Shao & Misić, 2023). Additionally, as government subsidies gradually decrease, the sustainability of the EV market will hinge on other aspects, like price competitiveness and technological progress (Sun et al., 2019).

In contrast to China, Malaysia's EV market is still in its early stages. Although the Malaysian government has implemented policies and incentives to promote EV adoption, including exemptions on import and excise taxes, the overall market remains less developed compared to China. According to Statista Market Insights in 2024, Malaysia's EV market is projected to generate revenues of MYR 1,042 million, with an expected annual growth rate of 4.44 %. This projected growth is expected to bring the market volume to MYR 1,295 million by 2029, alongside unit sales reaching 17,66k vehicles by the same year. The average price per EV is estimated to be MYR 77.9k in 2024. On a global scale, China is forecasted to lead the EV market, generating MYR 376,400 million in revenue for 2024. Malaysia's EV adoption is rising, driven by government policies aimed at encouraging sustainable transportation (Statista Market Insights, 2024).

Malaysia's EV policy framework is primarily outlined in the National Automotive Policy 2020, which seeks to encourage the uptake of next-generation vehicles, including EVs (Hamzah et al., 2022). However, the policy faces challenges related to limited charging infrastructure, high EV prices, and low public awareness of EV benefits (Asadi et al., 2022). Asadi et al. (2021) argue that these barriers impede Malaysia's shift to EVs, despite government initiatives to support a more sustainable vehicle industry. Moreover, Malaysia's automotive market is heavily influenced by the presence of conventional vehicle manufacturers, which dominate the market (Sang & Bekhet, 2015). Local automakers have been slower to adopt EV technologies, and this has impacted the overall pace of transition. As a result, while consumers are becoming more aware of EVs, their actual adoption remains limited due to the higher upfront costs and limited availability of models (Adnan et al., 2017). On the other hand, Malaysia's gradual shift toward EVs has been bolstered by regional efforts to promote sustainability, such as the Association of Southeast Asian Nations (ASEAN) EV Initiative (Hamzah et al., 2022). This collaboration aims to create a more harmonized approach to EV adoption across the region. Malaysia has the potential to become a key player in the ASEAN EV market, but significant challenges must be addressed to achieve this goal (Veza et al., 2022).

These economic, policy, and cultural differences between China and Malaysia significantly enhance the comparative value of this study (Yu, Teoh, Liao, & Wang, 2025). By examining a mature market like China alongside an emerging market such as Malaysia, the analysis can

identify both context-specific and universal drivers of EV adoption. This comparative approach not only deepens our understanding of EV transition factors in the Asian context but also provides insights that can be generalized to other emerging or developed markets with similar characteristics. Such distinctions are critical for tailoring marketing strategies and policy interventions to diverse market environments.

While adopting EVs is essential for addressing challenges like environmental sustainability, policy support, and sustainable transport systems, individual consumer acceptance is fundamental to maintaining progress (Asadi et al., 2021). Consequently, examining the factors that influence EV adoption is vital for identifying strategies to accelerate the transition to EVs and effectively lower carbon emissions. The next section will utilize the theoretical framework of the PPM model to investigate these factors and shed light on their impact on EV adoption across different countries.

2.2. Theoretical framework: the push-pull-mooring model

The PPM model is a widely recognized framework originally developed to explain migration behavior, providing an understanding of the elements that prompt individuals to relocate from one place to another (Lee, 1966). Over time, the model has evolved and expanded beyond migration, proving useful in various domains including consumer switching behavior, transportation, and technology adoption (Bansal et al., 2005). The PPM model categorizes influencing factors into three groups: push, pull, and mooring, which has been applied in previous studies such as halal cosmetic products (Al-Banna & Jannah, 2022), medical mobile payment (High, 2021), and mobile communication applications (Sun et al., 2017). Push factors are unfavorable elements of the current situation that compel individuals to move away from their status quo, while pull factors are appealing characteristics of the alternative option that encourage the switch (Nguyen et al., 2024). Mooring factors, on the other hand, either facilitate or hinder the switching process based on personal, social, or circumstantial barriers (Hou et al., 2011; Moon, 1995). Unlike widely known models like the technology acceptance model, the unified theory of acceptance and use of technology, and the theory of planned behavior, the PPM model does not prescribe fixed constructs (Nguyen et al., 2023). Its flexible structure enables the incorporation or exclusion of particular constructs within the three categories—push, pull, and mooring—depending on the research context and subject matter. Mooring factors consistently engage with both push and pull factors, facilitating the integration and connection of the various elements of the model (Hu et al., 2023a; Nguyen et al., 2024). This model's adaptability supports the integration of context-specific constructs, allowing it to be tailored to various fields and research settings.

In this research, we utilize the PPM model to investigate the factors affecting the intention to transition from traditional fuel vehicles to EVs in China and Malaysia. Push factors are defined as elements that lead to dissatisfaction with traditional fuel vehicles and financial pressure (Hu et al., 2023a; Jung et al., 2017). Conversely, pull factors relate to the perceived advantages of adopting EVs (Hu et al., 2023a; Nguyen et al., 2024). In this analysis, we explore the significance of perceived value, highlighting how consumers recognize benefits regarding ecological sustainability, technological advancement, and cost savings (Nguyen et al., 2024). Additionally, external motivators such as incentive policies from governments and social influence from peers and society also act as key pull factors that attract individuals toward adopting EVs (Chun et al., 2023; Jain et al., 2022; Jaiswal et al., 2021; Wang et al., 2021). Nevertheless, despite the existence of push and pull forces, mooring factors often emerge as crucial moderators in the decision-making process. Switching costs—both financial and non-financial—are among the primary obstacles to transitioning (Jung et al., 2017; Sun et al., 2017). These encompass the initial expense of EVs, the accessibility of charging infrastructure, and perceived inconveniences during the transition (Nguyen et al., 2024). Furthermore, inertia, the inclination to remain

with familiar choices due to comfort or habitual behavior, complicates the switching process, deterring some consumers from adopting EVs despite the potential advantages (Hu et al., 2023a). By incorporating these constructs into the PPM framework, this research seeks to provide a thorough analysis of the elements affecting consumers' intentions to switch in China and Malaysia, illuminating the intricate interactions between push, pull, and mooring forces in the context of EV adoption.

2.2.1. Push factors and motorists' switching intention to adopt EVs

Push factors denote the unfavorable aspects or circumstances linked to the current situation that drive individuals away from their existing choices (Moon, 1995; Nguyen et al., 2024). Regarding the transition from traditional fuel vehicles to EVs, these factors generate dissatisfaction and encourage consumers to explore alternatives (Hsieh, 2021; Sun et al., 2017). One significant push factor is discontent with traditional fuel vehicles, particularly due to their detrimental environmental effects and the growing awareness of their role in contributing to air pollution and climate change (Cruz-Jesus et al., 2023; S. Wang, Wang, & Yang, 2020). This increasing consciousness has fostered a stronger sense of accountability among consumers, motivating them to consider more eco-friendly options like EVs (Karuppiyah & Ramayah, 2022). Another significant push factor is cost pressure, which includes the rising operational costs of conventional vehicles (Hu et al., 2023a). The volatility of fuel prices, maintenance expenses, and potential future regulatory costs related to carbon emissions all contribute to the economic strain of owning a traditional fuel vehicle (Sun et al., 2023; Zhang et al., 2022). Hence, consumers feel compelled to explore more cost-effective and sustainable options like EVs. Together, these push factors—environmental concerns and financial pressure—motivate consumers to move away from conventional fuel vehicles and consider switching to electric alternatives.

2.2.1.1. Dissatisfaction with traditional fuel vehicles. Dissatisfaction with traditional fuel vehicles significantly impacts consumers' choices to consider alternative transportation options (Adu-Gyamfi et al., 2022; Salari, 2022). Conventional fuel vehicles are increasingly linked to negative environmental consequences, including greenhouse gas emissions, air pollution, and reliance on fossil fuels (He et al., 2022; Zhang et al., 2022). These issues have contributed to rising awareness among consumers about the detrimental effects of internal combustion engine vehicles on the ecosystem (Philip et al., 2023; Truong et al., 2024; Upadhyay & Kamble, 2023). This enhanced environmental awareness fosters dissatisfaction with conventional fuel vehicles, prompting motorists to seek greener alternatives, such as EVs (Adnan et al., 2018; Nguyen et al., 2024; Song et al., 2023). In addition to environmental concerns, dissatisfaction related to costs also drives the shift away from traditional fuel vehicles (Hu et al., 2023a; Zhang et al., 2022). Rising fuel prices, increasing maintenance costs, and potential future taxes or penalties for using fossil-fuel-powered vehicles add to the financial burden on consumers (Hu et al., 2023a; Ruoso & Ribeiro, 2022; Salari, 2022). These economic pressures further reinforce the dissatisfaction motorists experience with traditional vehicles, increasing their openness to considering EVs as a more cost-effective and sustainable option (Asadi et al., 2022; Buranelli de Oliveira et al., 2022). As dissatisfaction with traditional fuel vehicles grows, it is expected that this discontent will act as a significant driver in the intention to switch to EVs. The push to adopt EVs becomes stronger as the perceived drawbacks of traditional fuel vehicles intensify, encouraging motorists to embrace environmentally friendly and cost-efficient alternatives. Thus, the following hypothesis is put forward.

H1. Dissatisfaction with traditional fuel vehicles pushes motorists away from traditional fuel vehicles, increasing their switching intention to adopt EVs.

2.2.1.2. Cost pressure. Cost pressure is a critical factor influencing the

choice to transition from conventional fuel vehicles to EVs. The ownership of traditional fuel-powered vehicles is becoming increasingly expensive due to several factors. Rising fuel prices, frequent maintenance requirements, and the overall operating costs associated with conventional vehicles contribute to a growing financial burden on motorists (Galati et al., 2023; Hu et al., 2023a; Tamakloe & Caesar, 2024). As these expenses increase, the cost-effectiveness of traditional fuel vehicles diminishes, prompting consumers to seek more economical alternatives (Philip et al., 2023; Tamakloe & Caesar, 2024; Zheng et al., 2022). Furthermore, there is heightened apprehension regarding future regulatory measures, such as carbon taxes, emission-related fines, or restrictions on fuel-powered vehicles, which further amplify the financial pressure on consumers (Z. He, Zhou, et al., 2022; Zhang et al., 2022). These anticipated costs contribute to a sense of economic insecurity, pushing motorists to explore more sustainable and cost-efficient transportation options (Hu et al., 2023a; Zhang et al., 2022). In contrast, EVs provide long-term savings in fuel and maintenance expenses, while government incentives, including subsidies and tax breaks, make the transition to EVs more appealing from a financial perspective (Hoerler et al., 2023; Tan et al., 2022; Zhang et al., 2022). As cost pressure intensifies, consumers become more inclined to perceive EVs as a feasible and attractive alternative, increasing their intention to switch (Chinen et al., 2022; Hu et al., 2023a). This economic motivation plays a crucial role in the decision-making process, as individuals seek to minimize ongoing expenses and safeguard themselves against future financial uncertainties associated with conventional fuel vehicles (Lu et al., 2021; Singh et al., 2020). Consequently, the following hypothesis is put forward.

H2. Cost pressure pushes motorists away from traditional fuel vehicles, increasing their switching intention to adopt EVs.

2.2.2. Pull factors and motorists' switching intention to adopt EVs

Pull factors refer to the favorable characteristics and advantages linked to the alternative option, which attract consumers and encourage them to switch (Hu et al., 2023a; Moon, 1995). In the context of adopting EVs, pull factors are those advantages that make EVs an appealing choice compared to traditional fuel vehicles. One of the most significant pull factors is perceived value (Al-Banna & Jannah, 2022). Consumers perceive EVs as innovative, environmentally friendly, and increasingly practical (Nguyen et al., 2024). The reduced carbon emissions, lower running costs, and fewer maintenance requirements associated with EVs appeal to environmentally conscious and economically savvy consumers. As EV technology advances, consumers also recognize the enhanced driving experience, reliability, and long-term savings EVs offer, making them a highly attractive alternative. Another critical pull factor is the significance of incentive programs (Hu et al., 2023a). Governments across many countries, including China and Malaysia, provide various incentives to encourage the uptake of EVs (Adnan et al., 2018; Asadi et al., 2021, 2022; Wang et al., 2022). These include subsidies, tax breaks, and access to exclusive benefits such as reduced registration fees or priority parking (Mehdizadeh & Klockner, 2024; Tamakloe & Caesar, 2024; Zheng et al., 2022). Such policies significantly lower the barriers to entry, making EVs easier to obtain and financially appealing to a wider range of consumers (Truong et al., 2024). Additionally, social influence significantly impacts consumer behavior regarding EV adoption (Hu et al., 2023a; Sun et al., 2022). As the demand for EVs grows and becomes more mainstream, the perception of owning an EV is increasingly associated with social status and environmental responsibility (Hsieh, 2021; Hu et al., 2023a). Positive recommendations from peers, endorsements from public figures, and the societal shift toward sustainability act as motivating factors for individuals to switch to EVs, driven by the desire to align with these social norms and expectations (Karuppiyah & Ramayah, 2022; Shanmugavel & Balakrishnan, 2023; Sun et al., 2022).

2.2.2.1. Perceived value. Perceived value is a crucial factor in shaping consumer choices, especially regarding the adoption of new technologies like EVs (Zhang et al., 2022). The perceived value of EVs relates to how much consumers believe that EVs provide benefits over traditional fuel vehicles in areas such as cost savings, environmental impact, and driving experience (Chinen et al., 2022; Singh et al., 2020). From an economic standpoint, EVs are frequently regarded as offering long-term savings because of reduced fuel expenses and lower maintenance needs compared to conventional vehicles (Ilahi et al., 2024; Philip et al., 2023; Wang et al., 2024). Consumers understand that while the upfront cost of an EV may be higher, the overall ownership cost can be lower in the long run, leading to the impression that EVs deliver greater value for money (Budnitz et al., 2024; Chinen et al., 2022; Tamakloe & Caesar, 2024). Additionally, the environmental benefits associated with EVs are a key factor in perceived value (Hu et al., 2023b; Lin & Shi, 2022; Si et al., 2022; Upadhyay & Kamble, 2023). As awareness of climate change and environmental degradation grows, more consumers view EVs as an eco-friendly option that resonates with their commitment to reducing carbon emissions and minimizing environmental impact (Asadi et al., 2022; Hu et al., 2023a; Nguyen et al., 2024). This positive perception enhances the attractiveness of EVs as a forward-thinking and responsible choice. Finally, advancements in EV technology have improved the driving experience, including faster acceleration, quieter operation, and advanced features such as autonomous driving capabilities (Carrel et al., 2022; Hu et al., 2023a). These technological benefits add to the overall perceived value of EVs, making them an appealing alternative to traditional vehicles (Nguyen et al., 2024; Shanmugavel & Balakrishnan, 2023). As a result, a greater perceived value of EVs increases the likelihood that consumers will consider switching from traditional fuel vehicles. The recognition of these economic, environmental, and technological advantages serves as a powerful pull factor, motivating consumers to adopt EVs. Therefore, the following hypothesis is presented.

H3. Perceived value pulls motorists toward EVs, increasing their switching intention to adopt them.

2.2.2.2. Incentive policy. Incentive policies are essential for promoting the adoption of EVs by lowering financial barriers and making the transition more attractive to consumers (Hu et al., 2023b). Governments worldwide, including in China and Malaysia, have introduced various incentive programs aimed at facilitating the shift to EVs, which serve as a powerful pull factor for potential buyers (Adnan et al., 2018; Asadi et al., 2021; Sang & Bekhet, 2015; Wang et al., 2017). These incentive policies often include financial subsidies, such as cash rebates or direct discounts on the purchase cost of EVs, making them more affordable in comparison to traditional fuel-powered vehicles (Hu et al., 2023b; Mohammadzadeh et al., 2022; Wang et al., 2018). Additionally, tax reductions or exemptions further decrease the overall ownership expenses, increasing the attractiveness of EVs (Hu et al., 2023b; Philip et al., 2023). This financial relief helps to mitigate the typically higher initial cost of EVs, encouraging more consumers to consider making the switch. Moreover, some policies provide non-financial incentives, such as priority access to high-occupancy vehicle (HOV) lanes, free or discounted parking, and exemptions from certain driving restrictions in congested urban areas (Hu et al., 2023a). These added benefits create practical advantages for EV owners, further enhancing the appeal of EVs over traditional vehicles (Singh et al., 2020; Tamakloe & Caesar, 2024; Truong et al., 2024). In addition to financial and non-financial incentives, government initiatives aimed at expanding charging infrastructure and offering subsidies for home chargers also contribute significantly to alleviating range anxiety and improving the convenience of owning an EV (Jain et al., 2022; Jaiswal et al., 2022). These policies not only incentivize the purchase of EVs but also support a seamless transition by addressing potential concerns related to charging availability (Budnitz et al., 2024; Hoerler et al., 2023). As a result, the

presence of robust incentive policies significantly increases the perceived benefits of switching to EVs, making them a more attractive option for consumers (Lin & Shi, 2022; Si et al., 2022). These policies act as a strong pull factor, motivating individuals to transition away from traditional fuel vehicles and adopt EVs as their preferred mode of transportation. Thus, the following hypothesis is proposed.

H4. Incentive policies pull motorists toward EVs, increasing their switching intention to adopt them.

2.2.2.3. Social influence. Social influence is crucial in determining consumer behavior and decision-making, particularly regarding the adoption of new technologies like EVs (Hu et al., 2023a; Singh et al., 2020). Social influence refers to the influence that individuals' social circles—such as family, friends, colleagues, and even public figures—can have on their attitudes and behaviors toward adopting EVs (Jaiswal et al., 2022; Sun et al., 2022; Tamakloe & Caesar, 2024). As EVs become more widespread and publicly recognized, peer influence begins to affect consumer perceptions. When individuals observe friends, family members, or colleagues adopting EVs, they are more likely to perceive these vehicles as socially acceptable and desirable (Shanmugavel & Balakrishnan, 2023; Tamakloe & Caesar, 2024). The positive experiences and recommendations shared by others can significantly boost the appeal of switching to EVs (Asadi et al., 2022). This phenomenon aligns with the concept of normative social influence, where people are inclined to adopt behaviors that align with the perceived expectations of their social group (Shanmugavel & Balakrishnan, 2023; Vrain et al., 2022). Beyond personal networks, societal trends toward sustainability and environmental responsibility are also driving social influence (van 't Veer et al., 2023). The increasing global focus on lowering carbon emissions and shifting towards cleaner energy sources creates a favorable environment for the adoption of EVs (Song et al., 2023; Tamakloe & Caesar, 2024). Public discourse on the importance of environmentally conscious decisions encourages individuals to switch to EVs to align with these social values and to improve their personal and social image (Gehlmann et al., 2024). In some cases, influencers and public figures who endorse sustainable living and advocate for EVs can also have a substantial impact (Jaiswal et al., 2021). Their endorsements and actions can shape public perceptions and inspire others to follow suit, further enhancing the influence of social dynamics in driving EV adoption (Shanmugavel & Balakrishnan, 2023; Tamakloe & Caesar, 2024). Given that consumers are often influenced by the attitudes and behaviors of those around them, social influence becomes a key pull factor, encouraging individuals to switch to EVs to align with societal expectations and gain social approval (Hu et al., 2023a). Therefore, we hypothesize.

H5. Social influence pulls motorists toward EVs, increasing their switching intention to adopt them.

2.2.3. Mooring factors and motorists' switching intention to adopt EVs

Mooring factors encompass the personal, social, or situational conditions that either support or obstruct a consumer's decision to transition from one product or service to another (Hu et al., 2023a; Nguyen et al., 2024). When it comes to adopting EVs, these factors serve as stabilizing or restraining forces, influencing how easily individuals can move from traditional fuel vehicles to EVs. Mooring factors frequently interact with both push and pull factors, leading to a more intricate decision-making process (Hsieh, 2021). A key mooring factor is switching costs, which encompass financial and non-financial components (Nguyen et al., 2024). Financial switching costs refer to the substantial initial investment needed for purchasing an EV in comparison to traditional vehicles (Nguyen et al., 2024). Although EVs provide long-term savings, the upfront cost can pose a considerable obstacle for many consumers. Non-financial switching costs involve the time and effort needed to adapt to new driving experiences, comprehend charging

infrastructure, and change habits related to vehicle use (Nguyen et al., 2024). Another important mooring factor is inertia, which refers to consumers' reluctance to change due to comfort with their existing situation (Hu et al., 2023a). Many consumers may feel hesitant to adopt EVs simply because they are accustomed to driving traditional fuel vehicles (Carrel et al., 2022). The convenience of current fuel networks, familiarity with internal combustion engine vehicles, and general resistance to change can make switching less appealing, despite the potential benefits of EVs (Hu et al., 2023a). This inertia can slow the transition, even when push and pull factors indicate that switching to EVs is a desirable choice. Mooring factors, including switching costs and inertia, create friction in the decision-making process and can either delay or hinder the adoption of EVs (Hu et al., 2023a). These factors complicate the transition by introducing psychological, financial, or habitual barriers that consumers must overcome to make the switch (Hoerler et al., 2023). Therefore, recognizing the significance of mooring factors is crucial for formulating strategies to encourage EV adoption by addressing these barriers.

2.2.3.1. Switching costs. Switching costs encompass the financial, psychological, and time-related burdens associated with changing from one product or service to another (Hsieh, 2021; Jung et al., 2017; Nguyen et al., 2024; Sun et al., 2017). When it comes to the transition from traditional fuel vehicles to EVs, these costs are critical in the decision-making process, acting as a mooring factor that can either delay or hinder the switch to EVs (Nguyen et al., 2024). Financial switching costs are perhaps the most apparent barrier. Although EVs may provide long-term savings regarding fuel efficiency and maintenance (Singh et al., 2020), the significant upfront expenses involved in purchasing an EV, including the vehicle's price, installation of home charging infrastructure, and potential retrofitting of other equipment, can deter consumers from making the switch (S. Y. He, Zhou, et al., 2022). Even with government incentives, the perceived initial investment is often substantial, particularly for individuals on tight budgets (Goel et al., 2023). Beyond financial considerations, non-financial switching costs also significantly influence consumer decisions. These include the time and effort required to adapt to new behaviors, such as learning how to manage charging schedules and understanding the range limitations of EVs (Goel et al., 2023; Yao et al., 2024). Additionally, concerns about the availability and convenience of charging infrastructure, especially in less urbanized areas, create uncertainty, further discouraging consumers from adopting EVs (Goel et al., 2023; Tamakloe & Caesar, 2024; Truong et al., 2024). Such psychological barriers contribute to the perceived burden of switching, making it less appealing. However, while these switching costs can impede the decision to adopt EVs, they do not eliminate the possibility of switching. As technology advances and charging infrastructure expands, the perceived costs may decrease, making the transition more attractive over time (Hu et al., 2023a; Ullah et al., 2024; Upadhyay & Kamble, 2023). In this sense, switching costs function as a mooring factor that initially slows down the process of adopting EVs but can be overcome as the benefits outweigh these challenges (Nguyen et al., 2024). Thus, the following hypothesis is proposed.

H6. Switching costs act as a mooring factor, slowing down the switching intention to adopt EVs.

2.2.3.2. Inertia. Inertia refers to consumers' tendency to stick with their current behavior or choices due to habit, convenience, or resistance to change (Hsieh, 2021; Sun et al., 2017). When it comes to embracing new technologies, such as EVs, inertia serves as a mooring factor that can significantly slow down or hinder the transition from conventional fuel vehicles to EVs (Hu et al., 2023a; S. Wang, Wang, & Yang, 2020). Consumers may experience psychological comfort with traditional fuel vehicles, having become accustomed to their driving habits, maintenance routines, and the widespread availability of fueling stations (Hu

et al., 2023a). The familiarity of using a conventional vehicle creates a sense of security and convenience, making the idea of switching to an EV seem daunting or unnecessary (Hu et al., 2023a; S. Wang, Wang, & Yang, 2020). This habitual comfort is a key component of inertia, as many motorists are reluctant to disrupt their established routines, even when presented with more environmentally friendly or cost-effective alternatives (Zhang et al., 2022). Additionally, the perceived risks associated with adopting EVs, such as concerns regarding charging infrastructure, battery life, and resale value, further reinforce inertia (Chen, Khan, et al., 2024; Hu et al., 2023a). These uncertainties create a fear of the unknown, discouraging consumers from exploring EVs despite their potential benefits (Carrel et al., 2022). The hesitance to adopt new technology due to a lack of understanding or confidence in its reliability is a common form of inertia that slows down the adoption process. Moreover, lifestyle compatibility plays a role in inertia (Sabrauvard et al., 2024; Sun et al., 2017). Consumers may feel that EVs do not fit seamlessly into their current lifestyles, particularly if they frequently drive long distances or live in areas with limited charging infrastructure (Pradeep et al., 2021; Ruoso & Ribeiro, 2022). The perceived inconvenience of needing to adapt to new systems, such as planning trips around charging stations, can cause individuals to delay their decision to switch (Salari, 2022; Truong et al., 2024). Inertia, therefore, acts as a powerful mooring factor that prevents or delays the intention to adopt EVs (Hu et al., 2023a; S. Wang, Wang, & Yang, 2020). Overcoming inertia requires addressing the psychological, practical, and perceived barriers that keep consumers tied to traditional fuel vehicles (Hu et al., 2023a). As these barriers diminish through technological advancements and societal shifts toward sustainability, inertia's impact may lessen, but it remains a significant factor in the decision-making process (Hsieh, 2021; Hu et al., 2023a). Thus, the following hypothesis is proposed.

H7. Inertia acts as a mooring factor, slowing down the switching intention to adopt EVs.

2.3. Green self-identity and its moderating role

Green self-identity encompasses the extent to which individuals see themselves as environmentally conscious and engaged in sustainable behaviors (Barbarossa et al., 2015; Cruz-Jesus et al., 2023). This personal identification with environmental values can influence various behavioral intentions, particularly the decision to adopt environmentally friendly technologies such as EVs (Karuppiyah & Ramayah, 2022; Narayan et al., 2022). People with a strong green self-identity prioritize the environmental advantages of EVs (Barbarossa et al., 2015), which may enhance or diminish the influence of various push, pull, and mooring factors on their decision to transition from traditional fuel vehicles to EVs. Green self-identity plays a moderating role (Cruz-Jesus et al., 2023), meaning that it can strengthen or weaken the relationship between these factors (such as dissatisfaction, cost pressure, perceived value, incentive policy, social influence, switching costs, and inertia) and the intention to adopt EVs.

2.3.1. Green self-identity and push factors

Dissatisfaction with traditional fuel vehicles is a significant push factor driving motorists to consider switching to EVs. Traditional fuel vehicles are associated with higher emissions, dependence on fossil fuels, and rising fuel costs, all of which may cause dissatisfaction among environmentally conscious consumers (Cruz-Jesus et al., 2023; Kwon et al., 2020; Li et al., 2021). For individuals with a strong green self-identity, these environmental drawbacks are likely to be even more salient, as they align with their personal values and commitment to reducing environmental impact (Cruz-Jesus et al., 2023; Salari, 2022). Thus, green self-identity is anticipated to amplify the impact of dissatisfaction with traditional fuel vehicles on the decision to adopt EVs (Almansour, 2022; Barbarossa et al., 2015). Motorists who possess a

strong green self-identity are more inclined to perceive EVs as a solution to the environmental and personal drawbacks associated with traditional fuel vehicles (Barbarossa et al., 2015; He et al., 2021; Salari, 2022). They may be more willing to switch to EVs in response to their dissatisfaction because EVs align with their pro-environmental identity (Karuppiyah & Ramayah, 2022). Therefore, the following hypothesis is proposed.

H8a. Green self-identity positively moderates the effect of dissatisfaction with traditional fuel vehicles on switching intention to adopt EVs.

Cost pressure, including rising fuel prices and the increasing maintenance costs of traditional fuel vehicles, can be another push factor motivating the switch to EVs (Almansour, 2022; Salari, 2022; Zheng et al., 2022). For individuals with a strong green self-identity, cost pressure may be interpreted not only as a financial burden but also as an opportunity to transition to more sustainable alternatives (Cruz-Jesus et al., 2023; Hu et al., 2023b). These individuals are more likely to tolerate initial costs or challenges related to adopting EVs because they value the long-term environmental benefits of reducing emissions and fossil fuel consumption (Narayan et al., 2022; Salari, 2022). Moreover, those with a strong green self-identity may view the financial savings from lower fuel and maintenance costs associated with EVs as an additional incentive to switch (Karuppiyah & Ramayah, 2022). In contrast, individuals with weaker green self-identity may focus more on the immediate financial burdens, such as the cost of purchasing an EV, rather than the long-term environmental and economic benefits (Almansour, 2022; Hu et al., 2023b). Thus, green self-identity is expected to positively moderate the effect of cost pressure on the switching intention to adopt EVs, with individuals who strongly identify as environmentally conscious being more likely to respond to cost pressures by adopting greener transportation alternatives. Therefore, we hypothesize that.

H8b. Green self-identity positively moderates the effect of cost pressure on switching intention to adopt EVs.

2.3.2. Green self-identity and pull factors

In addition to its role in strengthening the influence of push factors, green self-identity can also positively moderate the effect of pull factors such as perceived value, incentive policies, and social influence on the intention to adopt EVs. Individuals who have a strong sense of green self-identity tend to be more attracted to the benefits of EVs, especially when these advantages resonate with their environmental values.

Perceived value refers to consumers' assessment of the advantages they anticipate gaining from a product or service in relation to the costs they incur (Ozturk et al., 2023; Upadhyay & Kamble, 2023). Regarding EVs, perceived value includes factors such as lower long-term operational costs, environmental sustainability, and an improved driving experience compared to conventional fuel vehicles (Zhang et al., 2022). For individuals with a strong green self-identity, the environmental advantages of EVs, such as reduced emissions and energy efficiency, hold particular significance. They may assign greater importance to the ecological impact of EVs, which amplifies their motivation to transition to these vehicles (Chinen et al., 2022; Nguyen et al., 2024). Green self-identity is likely to strengthen the influence of perceived value on the intention to adopt EVs (Karuppiyah & Ramayah, 2022). Motorists who identify as environmentally aware are more inclined to emphasize the ecological benefits of EVs, viewing them as an opportunity to align their transportation decisions with their green principles (Upadhyay & Kamble, 2023). Consequently, the perceived value of EVs is heightened for these individuals, increasing their intention to switch. Therefore, we propose that.

H8c. Green self-identity positively moderates the effect of perceived value on switching intention to adopt EVs.

Incentive policies, including subsidies, tax rebates, and government-

supported initiatives, are essential in encouraging the adoption of EVs by lowering their initial costs and enhancing accessibility (Jaiswal et al., 2021). For individuals with a strong green self-identity, these incentive programs may not only alleviate financial obstacles but also reinforce their commitment to environmental sustainability (Hu et al., 2023b; Shanmugavel & Balakrishnan, 2023). Such individuals are likely to view these programs as supportive of their pro-environmental behaviors and as indicators that adopting EVs aligns with societal efforts to promote sustainability (Decrinis et al., 2023; Upadhyay & Kamble, 2023; Zhang et al., 2022). Green self-identity is anticipated to enhance the influence of incentive policies on switching intention. Individuals who hold strong environmental values are more inclined to respond positively to incentives that facilitate EV adoption, as they perceive these initiatives as both financially beneficial and ethically congruent with their green identity (Budnitz et al., 2024; Hu et al., 2023b). Thus, we propose that.

H8d. Green self-identity positively moderates the effect of incentive policy on switching intention to adopt EVs.

Social influence encompasses the effect of others, including peers, family, or broader societal norms, on an individual's behavior (Jain et al., 2022). In the context of EV adoption, social influence can be observed through recommendations from friends, the visibility of EVs within one's community, or the rising social expectation of environmentally responsible behavior (Hu et al., 2023a). Individuals with a strong green self-identity are particularly susceptible to social influences related to environmental sustainability (Karuppiyah & Ramayah, 2022; Li et al., 2021). They are more inclined to be swayed by those who advocate for EVs as a green alternative and may feel a heightened urge to align with eco-friendly social norms (Karuppiyah & Ramayah, 2022). It is anticipated that green self-identity will amplify the influence of social factors on the intention to adopt EVs (Li et al., 2021). Environmentally conscious individuals are more likely to be driven by the social validation that comes with adopting EVs and to perceive EV ownership as a means of enhancing their social status within pro-environmental communities. Therefore, we propose that.

H8e. Green self-identity positively moderates the effect of social influence on switching intention to adopt EVs.

2.3.3. Green self-identity and mooring factors

While green self-identity plays a beneficial moderating role in enhancing the influence of push and pull factors, it may function as a detrimental moderator in relation to mooring factors such as switching costs and inertia. Mooring factors denote the obstacles that hinder or impede an individual's decision to embrace new technologies (Hu et al., 2023b; Nguyen et al., 2024), such as EVs, and green self-identity could help mitigate the effects of these barriers by promoting environmentally motivated behavior (Cruz-Jesus et al., 2023).

Switching costs are the perceived economic and non-economic barriers associated with moving from one product or service to another (Al-Banna & Jannah, 2022; Hsieh, 2021; Ofori et al., 2023). Regarding the adoption of EVs, these costs encompass the financial outlay for acquiring a new vehicle, potential inconveniences related to EV infrastructure, and adapting to a different kind of vehicle (Li et al., 2021; Nguyen et al., 2024). For many consumers, high switching costs can delay or discourage their decision to adopt EVs (S. Wang, Wang, & Yang, 2020). However, for those who possess a strong green self-identity, the inclination to align with their environmental values may lessen the impact of switching costs (Li et al., 2021). Individuals deeply committed to sustainability may be more inclined to overlook or tolerate higher switching costs, motivated by their strong desire to reduce their carbon footprint (Nguyen et al., 2024). Consequently, green self-identity could diminish the deterrent effect of switching costs, environmentally conscious individuals are more inclined to value long-term environmental benefits over immediate financial expenses. Therefore, we hypothesize that.

H8f. Green self-identity negatively moderates the effect of switching costs on switching intention to adopt EVs.

Inertia refers to the tendency of individuals to resist change and stick to familiar products or behaviors, even when new and potentially better alternatives are available (Hsieh, 2021; Hu et al., 2023a). For many motorists, inertia can manifest as a preference for continuing to use traditional fuel vehicles due to habit, comfort, or uncertainty about the unfamiliarity of EVs (Hu et al., 2023a). This resistance to change can create a considerable obstacle to adopting EVs. However, for individuals with a strong green self-identity, inertia may have a less powerful effect. Their environmental consciousness can act as a counterbalance to the comfort of the status quo, encouraging them to overcome habitual behavior and make the switch to EVs (Nguyen et al., 2024). These individuals are likely to perceive switching to EVs as a positive action that aligns with their identity and values, which can aid in diminishing the impact of inertia on their decision-making process (Hu et al., 2023a). Thus, green self-identity is anticipated to weaken the effect of inertia on switching intention, as those with a strong commitment to sustainability are more inclined to change their behavior in favor of environmentally friendly options like EVs. Therefore, we propose that:

H8g. Green self-identity negatively moderates the effect of inertia on switching intention to adopt EVs.

This study incorporates four control variables—gender, age, educational level, and monthly income—to account for potential extraneous influences and enhance the robustness of the statistical analysis. Gender has been identified as a factor influencing technology adoption behaviors, as men and women may exhibit different attitudes toward facial recognition payment (Yu et al., 2024). Age and educational level are also crucial considerations, as they shape individuals' awareness, technological proficiency, and decision-making processes regarding EV adoption (Pandita et al., 2024). Additionally, monthly income plays a significant role in purchase decisions, particularly for high-cost innovations like EVs, where financial capacity can impact switching

intentions (Chen et al., 2024; Pandita et al., 2024). By incorporating these control variables, this study aims to ensure a more precise examination of the determinants influencing consumers' intention to switch to EVs in China and Malaysia.

Thus, as illustrated in Fig. 1, the theoretical framework is introduced.

3. Research methodology

3.1. Measurement

This study employed nine measurement constructs, all of which were adapted from previous research and specifically modified for the context of switching intentions to adopt EVs. Dissatisfaction with traditional fuel vehicles was adapted from Al-Banna and Jannah (2022), Hsieh (2021), and Sun et al. (2017). The construct of cost pressure was sourced from Hu et al. (2023a), Jansson (2011), and Rezvani et al. (2015). Perceived value was assessed using a modified version of Zhang et al. (2022). Incentive policy was adapted from Hu et al. (2023b) and Jaiswal et al. (2021), while social influence was developed by integrating insights from Hu et al. (2023a) and van't Veer et al. (2023). Switching costs were measured using adaptations from Nguyen et al. (2024). Inertia was based on Hu et al. (2023a) and S. Wang, Wu, and Chen (2020). Green self-identity was sourced from Cruz-Jesus et al. (2023), while switching intention to adopt EV was measured using scales adapted from Hu et al. (2023a) and S. Wang, Wu, and Chen (2020). These constructs were selected to comprehensively capture the key factors influencing consumer decisions to switch from traditional fuel vehicles to EVs, reflecting both external and internal motivators in the decision-making process.

To establish content validity for the study on factors influencing switching intention toward adopting EVs, feedback was obtained from three professors with expertise in sustainable transportation and consumer behavior, leading to necessary adjustments in the survey instrument. The survey instruments were then professionally translated into Mandarin (for China) and Malay (for Malaysia) using a rigorous back-translation method (Brislin, 1980). This process involved the initial

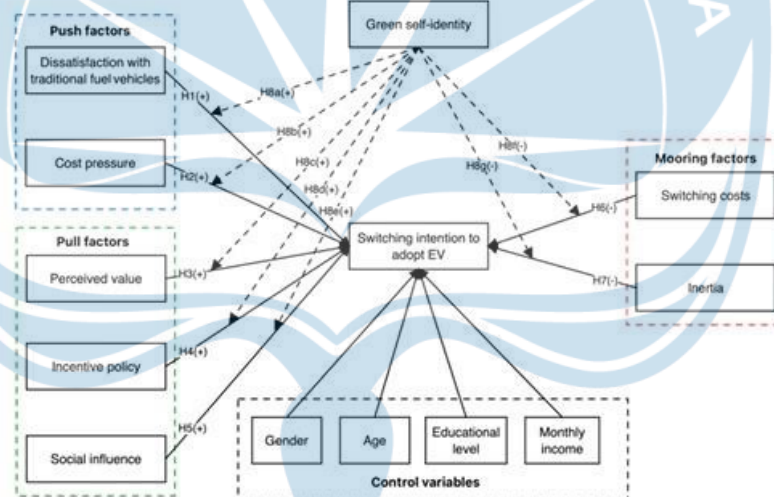


Fig. 1. Research framework.

translation by bilingual experts fluent in both English and the target language, followed by independent back-translation into English by separate translators to ensure conceptual equivalence. The research team and local linguists then conducted a committee review to resolve any discrepancies and ensure linguistic and conceptual consistency across both versions. Finally, the Mandarin and Malay versions were validated through pilot testing and focus group discussions to ensure cultural relevance and semantic accuracy. A pilot test was conducted involving 30 respondents familiar with EV adoption in both China and Malaysia. Furthermore, a focus group discussion was held with the authors, local transportation experts, EV service providers, and several motorists to further optimize the survey instrument. This process involved clarifying specific scenarios, rephrasing certain questions, removing irrelevant items, and enhancing the overall clarity of the content. Based on these insights, final refinements were made to ensure that the survey instrument accurately captured the factors influencing EV adoption in both countries. The finalized survey instrument used in the formal research is summarized in Table 1.

3.2. Data collection and sampling

This study investigates the factors influencing the intention to switch to EVs in China and Malaysia, focusing on the diverse socio-economic, cultural, and regulatory environments of these two countries. China, as a global leader in EV adoption and manufacturing, offers valuable insights into the behaviors of consumers in a mature EV market. In contrast, Malaysia, with its emerging EV infrastructure, provides a comparative perspective on EV adoption in a developing economy. By analyzing both countries, the study aims to achieve a comprehensive understanding of the factors influencing the intention to switch to EVs, contributing to a broader knowledge of sustainable transportation adoption and behavior.

To ensure randomness in the online context, the Wenjuanxing platform's algorithm was utilized to distribute the survey to users across diverse geographic locations and demographic groups within China and Malaysia. The platform's randomization feature allowed for the unbiased dispersal of the survey to its user base, minimizing selection bias. Additionally, stratified sampling was applied to achieve demographic balance in both countries. In China, strata were defined based on income levels (low, middle, high) and geographic regions (urban vs. rural) to capture the country's economic and spatial diversity. In Malaysia, stratification focused on ethnicity (Malay, Chinese, Indian) and urban-rural divides, reflecting the nation's multicultural population. Quotas for age, gender, and education level were set in both countries to ensure the sample closely mirrored national census data, enhancing demographic representativeness. In both countries, a cross-sectional survey was carried out using an online questionnaire distributed via the Wenjuanxing platform. The random distribution method, combined with stratified sampling, ensured diversity in the participant pool, targeting respondents with varying backgrounds and experiences in vehicle ownership and EV knowledge, thus improving the study's generalizability.

As shown in Appendix A, the survey instrument was structured into four sections: an introductory part explaining the research purpose, ensuring confidentiality, and defining EVs; a second section with screening questions to confirm participants' eligibility, including being 18 years or older, having some level of familiarity with EVs, and living in China or Malaysia. EV familiarity was assessed using the question: "Have you ever used, researched, or considered purchasing an EV?" Participants who selected "Yes" were deemed eligible to proceed, while those who selected "No" were excluded from the study. Eligible participants were directed to the main survey, while others were excluded. To incentivize participation, respondents who completed the survey were offered a small gift as compensation. While incentives can sometimes influence response behavior (e.g., attracting participants motivated primarily by rewards), the modest nature of the compensation (e.g., a

Table 1

Measurement scales.

Construct	Construct Code	Variable measurement content	Variable source
Dissatisfaction with traditional fuel vehicles	DTPV1	I am dissatisfied with the environmental impact of traditional fuel vehicles.	(Al-Battat & Jusoh, 2022; Hsieh, 2021; Sun et al., 2017)
	DTPV 2	I feel unhappy with the cost of maintaining traditional fuel vehicles.	
	DTPV 3	Using traditional fuel vehicles does not meet my expectations.	
	DTPV 4	I am frustrated with the long-term sustainability of traditional fuel vehicles.	
Cost pressure	CP1	I am concerned about the increasing fuel costs for traditional vehicles.	(Hu et al., 2023a; Jusoh, 2021; Rezvani et al., 2015)
	CP2	The rising maintenance expenses of traditional fuel vehicles create financial strain for me.	
	CP3	I feel burdened by the additional taxes and fees associated with owning a traditional fuel vehicle.	
	CP4	The overall cost of owning and operating a traditional fuel vehicle is becoming too high for me to manage.	
Perceived value	PV1	I believe that buying and driving an EV provides significant environmental benefits.	Zhang et al. (2022)
	PV2	Purchasing and using an EV enhances my social status.	
	PV3	Compared to traditional fuel vehicles, I find EVs to be more economical.	
	PV4	Driving an EV gives me a sense of contributing to a cleaner and more sustainable future.	
Incentive policy	IP1	I believe that government subsidies will encourage the adoption of EVs.	(Hu et al., 2023b; Jusoh et al., 2021)
	IP2	I think tax policy relaxation would make it easier to adopt EVs.	
	IP3	Subsidy and tax incentives are important factors in my decision to purchase an EV.	
	IP4	The government should provide additional incentives, beyond subsidies, to promote the use of EVs.	
Social influence	SI1	People I admire or respect have adopted or are planning to adopt EVs, which encourages me to do the same.	(Hu et al., 2023a; van't Veer et al., 2023)
	SI2	I feel influenced to purchase an EV based on the growing trend among my peers and social groups.	
	SI3	Seeing others in my community driving EVs makes me more inclined to consider getting one.	

(continued on next page)

Table 1 (continued)

Construct	Construct Code	Variable measurement content	Variable source
Switching costs	SC4	Advertisements and media that promote EVs make me feel more positive about adopting one.	Nguyen et al. (2024)
	SC1	I believe it would require a significant amount of money, time, and effort to find and purchase a suitable EV.	
	SC2	Finding convenient locations for parking and charging an EV would involve additional cost and effort.	
	SC3	The ongoing maintenance and battery recharge costs of an EV would be higher than for a traditional vehicle.	
Inertia	SC4	I think learning how to drive an EV and managing its unique requirements would involve considerable expense and effort.	Glu et al., 2023a; S. Wang, Wang, & Yang, 2020)
	INE1	Switching to an EV feels unnecessary unless my dissatisfaction with conventional vehicles significantly increases.	
	INE2	I prefer to stick with conventional vehicles out of routine and habit.	
	INE3	Transitioning to an EV seems like a hurdle due to the time and effort involved.	
Green self-identity	INE4	When it's time to purchase a new EV, I instinctively lean toward choosing a conventional vehicle without second thoughts.	Gruat-Jesus et al. (2023)
	GSI1	I consider myself someone who is mindful of environmental concerns.	
	GSI2	I see myself as an eco-conscious consumer.	
	GSI3	I care about how car usage impacts the environment.	
Switching intention to adopt EV	GSI4	I am concerned about how car usage contributes to air pollution.	Qiu et al., 2023a; S. Wang, Wang, & Yang, 2020)
	SIAE1	I am open to the idea of transitioning from a conventional vehicle to an EV.	
	SIAE2	There's a strong likelihood that I will opt for an EV soon.	
	SIAE3	I am determined to make the switch to an EV.	
	SIAE4	I would choose an EV as my primary mode of transportation for commuting.	

voucher or token gift) was designed to minimize such risks (Singer & Ye, 2013). To address potential concerns about response quality and honesty, attention-check questions ("Please select 'Neutral' to confirm you are reading this") and response time thresholds (minimum of 5 min) were embedded within the survey to identify and exclude inattentive or dishonest responses. These measures served as validation checks to reduce bias from incentivization. Additionally, the study's focus on participants with prior EV familiarity ensured that responses were grounded in relevant experience, mitigating superficial participation driven solely by the incentive. The final section gathered demographic information, including gender, age, education level, and income. The final section gathered demographic information, including gender, age, education level, and income.

Sample size determination for hypothesis testing was carried out using G*Power 3.1, considering the intricacy of the research model, the desired level of statistical significance, effect size, and power requirements (Soper, 2018). Following standard guidelines, a minimum of 194 participants per country was required. During the survey period, from February 2024 to May 2024, 753 participants in China and 602 in Malaysia passed the screening process. After excluding invalid responses, 696 valid responses were collected from China and 648 from Malaysia, surpassing the required sample size and ensuring the robustness of the statistical analysis (Hair et al., 2016).

The demographic characteristics of respondents from China and Malaysia are presented in Table 2, which highlights key similarities and differences. In terms of gender, both countries showed a fairly balanced representation, with 54.0 % male and 46.0 % female in China, and 52.3 % male and 47.7 % female in Malaysia. The age distribution revealed that the 26–35 age group was the largest in both countries, comprising 36.5 % of respondents in China and 35.2 % in Malaysia, followed by the 36–45 group at 29.5 % in China and 25.0 % in Malaysia. Younger respondents aged 18–25 made up 13.6 % in China and 17.1 % in Malaysia, while those aged 56 and over constituted 7.3 % and 8.8 %, respectively. Regarding education, the largest group in both countries held a bachelor's degree, with 39.8 % in China and 40.1 % in Malaysia. China had a slightly higher proportion of respondents with associate's degrees (24.6 % vs. 24.5 %), while Malaysia had more respondents with PhDs (6.0 % vs. 2.6 %). Additionally, 12.9 % of Chinese respondents and 10.3 % of Malaysians had completed senior high school or below. Income levels also varied, with the largest group in both countries earning RMB

Table 2
Demographics of respondents.

Category	China (N = 696)		Malaysia (N = 648)	
	Number	Percent (%)	Number	Percent (%)
Gender				
Male	376	54.0 %	339	52.3 %
Female	320	46.0 %	309	47.7 %
Age (years old)				
18–25	95	13.6 %	111	17.1 %
26–35	254	36.5 %	228	35.2 %
36–45	205	29.5 %	162	25.0 %
46–55	91	13.1 %	90	13.9 %
56 and over	51	7.3 %	57	8.8 %
Educational level				
Senior high school or below	90	12.9 %	67	10.3 %
Associate's degree	171	24.6 %	159	24.5 %
Bachelor's degree	277	39.8 %	260	40.1 %
Master's degree	140	20.1 %	123	19.0 %
PhD	18	2.6 %	39	6.0 %
Monthly income (RMB)				
3000 and below	25	3.6 %	42	6.5 %
3001–6000	168	24.1 %	153	23.6 %
6001–9000	268	38.5 %	213	32.9 %
9001–12000	208	29.9 %	156	24.1 %
12001 and over	27	3.9 %	84	13.0 %

6001–9000, representing 38.5 % in China and 32.9 % in Malaysia. However, a higher percentage of Malaysians earned RMB 12001 and over (13.0 %) compared to China (3.9 %). These demographic patterns provide a foundation for comparative examination of the factors affecting the intention to switch to adopt EVs in both countries.

3.3. Common method variance

Common method variance (CMV) was proactively addressed in this study to minimize its potential impact on the results, following the recommendations of Zheng et al. (2013). Several procedural measures were employed to mitigate CMV. First, the structure of the questionnaire was optimized before data collection, ensuring brevity and clarity. Respondents were assured of anonymity, aiming to reduce social desirability bias and evaluation apprehension (Chong et al., 2018). Furthermore, the questionnaire highlighted the importance of providing honest responses to minimize response bias. The order of items was counterbalanced to avoid sequence-related bias, and the questionnaire was kept concise to maintain respondent engagement, reducing the risk of fatigue or boredom (Lindell & Whitney, 2001). Additionally, demographic questions were positioned at the end to prevent their influence on responses to the key constructs.

To further address CMV, two analytical techniques were used. First, Harman's single-factor test was conducted on the entire dataset, revealing that the first factor accounted for 23.456 % of the variance in China and 25.678 % in Malaysia. Both values are under the 50 % threshold suggested by Hult (2009) and Podsakoff et al. (2003). This result indicates that CMV was not a major issue. Second, the study applied the marker variable technique through confirmatory factor

analysis (CFA), as suggested by Lindell and Whitney (2001). Four items measuring perceptions of unrelated behaviors, such as internet usage frequency, served as marker variables. These variables were distinct from the main study constructs. The analysis indicated no significant relationships between the marker variables and the primary study variables, reinforcing the conclusion that CMV was not a major concern in this study, thus ensuring the validity of the results.

4. Data analysis and results

We conducted the data analysis using SmartPLS 4.0, which applies PLS-SEM. PLS-SEM was selected over covariance-based SEM (CB-SEM) because our data exhibited non-normal distributions and our sample sizes were relatively small, conditions under which PLS-SEM offers greater statistical power and robustness (Hair et al., 2016, 2021). Additionally, PLS-SEM is well-suited for the extension of an existing structural theory and complex models with moderating effects, such as our integration of the push-pull-mooring framework to examine factors influencing switching intention in EV adoption. Unlike CB-SEM, which requires strict assumptions regarding normality and large samples, PLS-SEM efficiently generates multiple measurement models along with a structural model, providing a comprehensive analysis of the relationships among the identified variables.

4.1. Measurement model

Table 3 presents the reliability and validity findings for the constructs in both the China and Malaysia datasets. All items' factor loadings surpass the recommended 0.7 threshold, confirming strong

Table 3
Reliability and validity.

Construct	Items	China (N = 696)				Malaysia (N = 648)			
		Factor loading	CA	CR	AVE	Factor loading	CA	CR	AVE
Dissatisfaction with traditional fuel vehicles	DITFV1	0.882	0.862	0.901	0.702	0.888	0.924	0.946	0.814
	DITFV2	0.787				0.919			
	DITFV3	0.820				0.895			
	DITFV4	0.860				0.907			
Cost pressure	CP1	0.776	0.851	0.860	0.691	0.917	0.924	0.945	0.812
	CP2	0.828				0.898			
	CP3	0.893				0.908			
	CP4	0.825				0.880			
Perceived value	PV1	0.764	0.856	0.880	0.695	0.911	0.924	0.946	0.814
	PV2	0.828				0.906			
	PV3	0.856				0.909			
	PV4	0.865				0.882			
Incentive policy	IP1	0.755	0.800	0.829	0.624	0.878	0.920	0.943	0.806
	IP2	0.765				0.912			
	IP3	0.892				0.894			
	IP4	0.738				0.907			
Social influence	SI1	0.896	0.822	0.831	0.653	0.912	0.935	0.953	0.837
	SI2	0.776				0.908			
	SI3	0.810				0.922			
	SI4	0.742				0.917			
Switching costs	SC1	0.858	0.876	0.880	0.728	0.895	0.915	0.940	0.798
	SC2	0.823				0.907			
	SC3	0.868				0.886			
	SC4	0.865				0.884			
Inertia	INE1	0.839	0.836	0.838	0.672	0.890	0.924	0.946	0.814
	INE2	0.754				0.906			
	INE3	0.837				0.906			
	INE4	0.845				0.907			
Green self-identity	GSI1	0.852	0.862	0.863	0.706	0.919	0.930	0.950	0.825
	GSI2	0.835				0.883			
	GSI3	0.836				0.894			
	GSI4	0.839				0.936			
Switching intention to adopt BEV	SIAE1	0.896	0.884	0.831	0.653	0.933	0.946	0.961	0.861
	SIAE2	0.776				0.928			
	SIAE3	0.810				0.928			
	SIAE4	0.742				0.923			

Note: CA: Cronbach's alpha; CR: Composite reliability; AVE: Average variance extracted.

indicator reliability (Fornell & Larcker, 1981). The values of Cronbach's alpha (CA) range from 0.800 to 0.884 in China and from 0.915 to 0.946 in Malaysia, demonstrating high internal consistency. The scores for Composite Reliability (CR) of each construct surpass the 0.7 benchmark, ranging from 0.829 to 0.901 in China and 0.940 to 0.961 in Malaysia, further supporting the constructs' internal reliability. Additionally, the values of Average Variance Extracted (AVE) exceed the 0.5 threshold, ranging from 0.624 to 0.728 in China and 0.798 to 0.861 in Malaysia, confirming the convergent validity of all constructs (Fornell & Larcker, 1981). These findings indicate that the measurement model is robust and reliable across both datasets.

Discriminant validity was assessed using the Fornell-Larcker criterion alongside the Heterotrait-Monotrait (HTMT) ratio. Table 4 illustrates that the square root of the Average Variance Extracted (AVE) for each construct, presented on the diagonal in bold, exceeds the corresponding inter-construct correlations for both the China and Malaysia datasets. This confirms the stronger relationship of each construct to its own indicators compared to other constructs (Fornell & Larcker, 1981). In the China sample, the square root of AVE values ranged from 0.790 to 0.862, whereas in the Malaysia sample, they ranged from 0.893 to 0.928, confirming satisfactory discriminant validity across both datasets. The HTMT ratios for all construct pairs fall below the conservative threshold of 0.85 (Kline, 2023), further supporting discriminant validity. For instance, in China, the highest HTMT value is 0.748 between "switching intention to adopt EV" and "switching costs," while in Malaysia, the highest is 0.501 between "incentive policy" and "dissatisfaction with traditional fuel vehicles." These results confirm the distinctiveness of the constructs, reinforcing the discriminant validity of the measurement model.

4.2. Structural model

After evaluating the measurement model, the assessment of the structural model was performed to evaluate the hypothesized relationships between variables in both the China and Malaysia datasets. Table 5 shows the outcomes of the structural model assessment, which includes path coefficients and related statistics. The VIF values remained significantly below the recommended threshold of 3.3, indicating the absence of substantial multicollinearity (Hair Jr et al., 2020). In China, VIF values ranged from 1.155 to 1.774, while in Malaysia, they ranged from 1.152 to 1.812. These results suggest that collinearity was not a concern in either dataset.

The results reveal significant relationships between key determinants of switching intention to adopt electric vehicles (SIAE) in both China and Malaysia. Figs. 2 and 3 present the structural model path results for both groups. Firstly, dissatisfaction with traditional fuel vehicles positively influenced SIAE in both China ($\beta = 0.079$, $t = 2.966$, $p < 0.01$) and Malaysia ($\beta = 0.142$, $t = 2.963$, $p < 0.01$), supporting H17. Cost pressure was also a significant positive predictor of SIAE in China ($\beta = 0.266$, $t = 6.713$, $p < 0.001$) and Malaysia ($\beta = 0.077$, $t = 2.369$, $p < 0.05$), confirming H2. Similarly, perceived value exerted a significant positive influence on SIAE in both China ($\beta = 0.061$, $t = 2.248$, $p < 0.05$) and Malaysia ($\beta = 0.124$, $t = 2.795$, $p < 0.01$), supporting H3. Incentive policy was found to positively influence SIAE in China ($\beta = 0.099$, $t = 3.064$, $p < 0.01$) and Malaysia ($\beta = 0.157$, $t = 3.059$, $p < 0.01$), supporting H4. Social influence significantly impacted SIAE in China ($\beta = 0.099$, $t = 2.809$, $p < 0.01$), but its effect was not significant in Malaysia ($\beta = 0.074$, $t = 1.796$, $p > 0.05$), supporting H5 only in China. Switching costs were found to have a significant negative effect on SIAE in both China ($\beta = -0.433$, $t = 10.286$, $p < 0.001$) and Malaysia ($\beta = -0.191$, $t = 4.130$, $p < 0.001$), confirming H6. Inertia did not significantly influence SIAE in China ($\beta = -0.020$, $t = 0.757$, $p > 0.05$), whereas it demonstrated a significant negative impact in Malaysia ($\beta = -0.173$, $t = 4.576$, $p < 0.001$), thus supporting H7 only in Malaysia.

Regarding the moderating effect of green self-identity (GSI), GSI positively moderated the relationship between dissatisfaction with

Table 4
Discriminant validity.

Fornell-Larcker Criterion	China										Malaysia									
	DFV	CP	PV	IP	SI	SC	INE	GSI	SIAE		DFV	CP	PV	IP	SI	SC	INE	GSI	SIAE	
Dissatisfaction with traditional fuel vehicles (DFV)	0.808										0.902									
Cost pressure (CP)	0.142	0.831									0.142	0.901								
Perceived value (PV)	0.214	0.254	0.834								0.151	0.251	0.902							
Incentive policy (IP)	0.249	0.389	0.314	0.790							0.460	0.099	0.422	0.898						
Social influence (SI)	0.087	0.319	0.292	0.509	0.808						0.385	0.236	0.446	0.429	0.915					
Switching costs (SC)	0.129	0.509	0.171	0.366	0.331	0.853					0.363	0.219	0.400	0.376	0.423	0.893				
Inertia (INE)	0.029	0.231	0.174	0.257	0.253	0.287	0.820				0.078	0.204	0.189	0.149	0.064	0.249	0.902			
Green self-identity (GSI)	0.150	0.527	0.158	0.346	0.313	0.536	0.226	0.841			0.406	0.182	0.281	0.397	0.379	0.257	0.104	0.908		
Switching intention to adopt EV (SIAE)	0.295	0.602	0.246	0.438	0.391	0.663	0.241	0.519	0.862		0.379	0.184	0.329	0.331	0.227	0.378	0.269	0.221	0.928	
Heterotrait-monotrait ratio																				
Dissatisfaction with traditional fuel vehicles (DFV)	0.160										0.144									
Cost pressure (CP)	0.250	0.285									0.379	0.266								
Perceived value (PV)	0.290	0.449	0.369								0.501	0.100	0.457							
Incentive policy (IP)	0.354	0.383	0.344	0.601							0.386	0.244	0.478	0.463						
Social influence (SI)	0.142	0.580	0.187	0.421	0.384						0.391	0.229	0.433	0.406	0.457					
Switching costs (SC)	0.063	0.277	0.205	0.306	0.299	0.536					0.090	0.217	0.203	0.074	0.160					
Inertia (INE)	0.170	0.609	0.180	0.412	0.369	0.614	0.264				0.439	0.187	0.306	0.431	0.404	0.276				
Green self-identity (GSI)	0.093	0.689	0.273	0.504	0.452	0.748	0.278	0.593			0.402	0.190	0.350	0.348	0.241	0.405	0.286			
Switching intention to adopt EV (SIAE)																				

Note: Values on diagonal, which are bold, are the square root of AVE. HTMT < 0.85 (Kline, 2023).

Table 5
Results of structural model assessment.

Hypothesis	Relationship	China						Malaysia					
		Coefficient	Std. Dev.	t-value	VIF	p-value	Supported	Coefficient	Std. Dev.	t-value	VIF	p-value	Supported
H1	DTFV→SIAE	0.079	0.027	2.966	1.155	0.003**	YES	0.142	0.048	2.963	1.623	0.003**	YES
H2	CP→SIAE	0.266	0.040	6.713	1.657	0.000***	YES	0.077	0.033	2.369	1.191	0.018*	YES
H3	PV→SIAE	0.061	0.027	2.248	1.206	0.025*	YES	0.124	0.044	2.795	1.557	0.005**	YES
H4	IP→SIAE	0.099	0.032	3.064	1.612	0.002**	YES	0.157	0.051	3.059	1.732	0.002**	YES
H5	SI→SIAE	0.099	0.035	2.809	1.533	0.005**	YES	0.074	0.041	1.796	1.771	0.073	NO
H6	SC→SIAE	-0.433	0.042	10.286	1.702	0.000***	YES	-0.191	0.046	4.130	1.537	0.000***	YES
H7	INE→SIAE	-0.020	0.027	0.757	1.174	0.449	NO	-0.173	0.038	4.576	1.152	0.000***	YES
H8a	GSI×DTFV→SIAE	0.033	0.032	1.028	1.227	0.304	NO	0.213	0.039	5.519	1.482	0.000***	YES
H8b	GSI×CP→SIAE	0.107	0.042	2.581	1.564	0.010*	YES	0.094	0.026	3.557	1.184	0.000***	YES
H8c	GSI×PV→SIAE	-0.021	0.031	0.680	1.303	0.496	NO	-0.007	0.047	0.156	1.812	0.876	NO
H8d	GSI×IP→SIAE	-0.038	0.034	1.119	1.675	0.263	NO	0.094	0.045	2.113	1.562	0.035*	YES
H8e	GSI×SI→SIAE	0.097	0.039	2.469	1.774	0.014*	YES	-0.056	0.038	1.473	1.671	0.141	NO
H8f	GSI×SC→SIAE	-0.107	0.040	2.690	1.679	0.007**	YES	-0.097	0.041	2.339	1.624	0.019*	YES
H8g	GSI×INE→SIAE	0.034	0.029	1.204	1.240	0.229	NO	0.003	0.041	0.084	1.382	0.933	NO
	Model fit					Q ²	R ²					Q ²	R ²
	SRMR	0.050			SIAB	0.429	0.591	SRMR	0.043		SIAB	0.280	0.331

Note: DTFV: Dissatisfaction with traditional fuel vehicles; CP: Cost pressure; PV: Perceived value; IP: Incentive policy; SI: Social influence; SC: Switching costs; INE: Inertia; GSI: Green self-identity; SIAE: Switching intention to adopt EV. Std. Dev.: Standard Deviation; VIF: Variance Information Factor.

*P < 0.05, **P < 0.01, and ***P < 0.001.

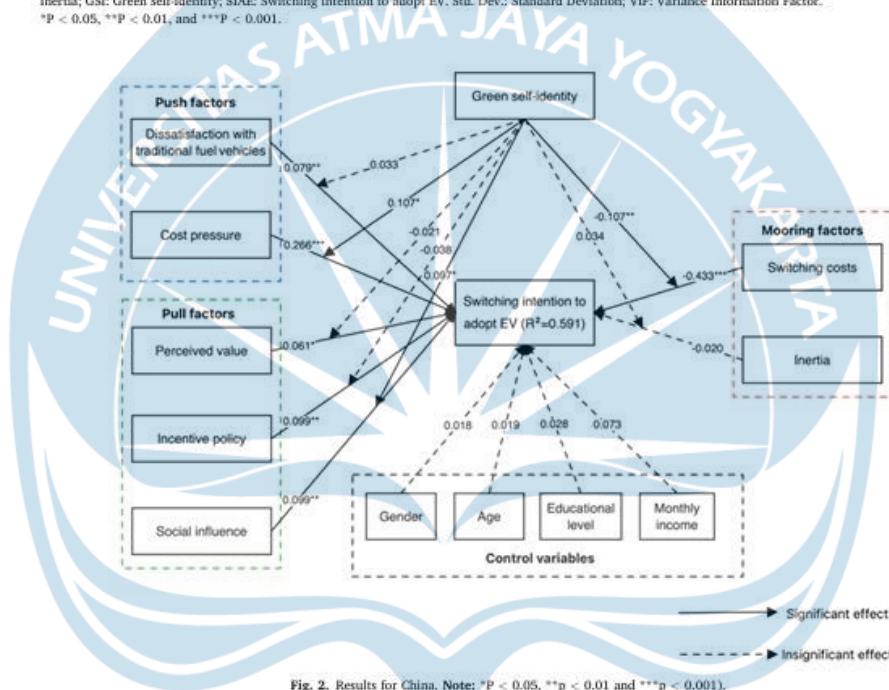


Fig. 2. Results for China. Note: *P < 0.05, **p < 0.01 and ***p < 0.001.

traditional fuel vehicles and SIAE in Malaysia ($\beta = 0.213$, $t = 5.519$, $p < 0.001$) but not in China ($\beta = 0.033$, $t = 1.028$, $p > 0.05$), supporting H8a only in Malaysia. GSI significantly moderated the relationship between cost pressure and SIAE in both China ($\beta = 0.107$, $t = 2.581$, $p < 0.05$) and Malaysia ($\beta = 0.094$, $t = 3.557$, $p < 0.001$), supporting H8b in both contexts. However, GSI did not significantly moderate the relationship between perceived value and SIAE in either China ($\beta = -0.021$, $t =$

0.680 , $p > 0.05$) or Malaysia ($\beta = -0.007$, $t = 0.156$, $p > 0.05$), leading to the rejection of H8c. GSI's moderation of the relationship between incentive policy and SIAE was insignificant in China ($\beta = -0.038$, $t = 1.119$, $p > 0.05$) but significant in Malaysia ($\beta = 0.094$, $t = 2.113$, $p < 0.05$), supporting H8d only in Malaysia. In terms of moderating the relationship between social influence and SIAE, GSI had a significant positive effect in China ($\beta = 0.097$, $t = 2.469$, $p < 0.05$) but not in

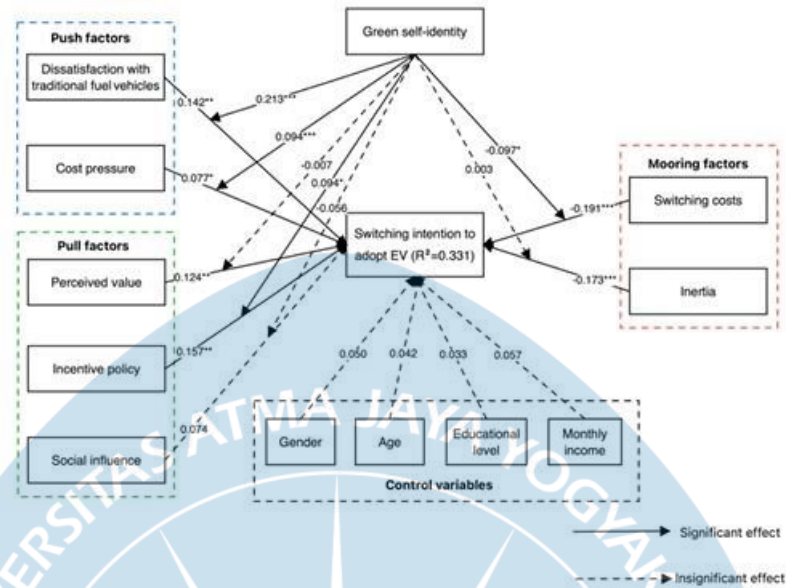


Fig. 3. Results for Malaysia. Note: * $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$.

Malaysia ($\beta = -0.056$, $t = 1.473$, $p > 0.05$), supporting H8e only in China. Lastly, GSI significantly moderated the relationship between switching costs and SIAE in both China ($\beta = -0.107$, $t = 2.690$, $p < 0.01$) and Malaysia ($\beta = -0.097$, $t = 2.339$, $p < 0.05$), confirming H8f. However, GSI did not moderate the relationship between inertia and SIAE in either China ($\beta = 0.034$, $t = 1.204$, $p > 0.05$) or Malaysia ($\beta = 0.003$, $t = 0.084$, $p > 0.05$), leading to the rejection of H8g.

As outlined by Hair et al. (2017), R^2 values of 0.75, 0.50, and 0.25 indicate substantial, moderate, and weak explanatory power, respectively. In this study, the R^2 values for switching intention to adopt EVs were 0.591 for China and 0.331 for Malaysia, indicating substantial and moderate explanatory power, respectively. To evaluate the model's predictive capability, a blindfolding procedure was conducted, yielding predictive relevance (Q^2) values for the dependent variable, switching intention to adopt EVs. The Q^2 value for SIAE in China was 0.429, while in Malaysia, it was 0.280. These values surpass the recommended threshold of 0.15, indicating a moderate to strong predictive capability of the model (Hair et al., 2012). The model fit indicators demonstrated an acceptable fit, with SRMR values below 0.08 (Hu & Bentler, 1999). The normed fit index (NFI) ranges between 0 and 1, with values above 0.9 indicating a good model fit (Bentler & Bonett, 1980; Zaman et al., 2022). In this study, the SRMR values (China: 0.050; Malaysia: 0.043) remained within the recommended thresholds, indicating a satisfactory model fit. The NFI values (China: 0.902; Malaysia: 0.916) were above the threshold, suggesting an acceptable fit (Zaman et al., 2022). Additionally, the RMS theta values (China: 0.118; Malaysia: 0.112) were below the 0.120 threshold, further supporting the model's adequacy (Zaman et al., 2022).

4.3. Multi-group analysis

To examine differences in the factors influencing the intention to switch to EVs between groups, a partial least squares multi-group analysis (PLS-MGA) was performed. Before proceeding with this analysis, measurement invariance was verified using the Measurement Invariance of Composite Models (MICOM) approach, following the guidelines provided by Henseler et al. (2016). The MICOM approach consists of three steps. The first step, configural invariance, verifies that the model structure remains consistent for each group, ensuring that constructs are measured equivalently (Rodríguez-Torres et al., 2020). Table 6 indicates that configural invariance was confirmed across all constructs, demonstrating that the measurement model holds consistently across both groups. The second step, compositional invariance, involves testing whether the correlation c -values for each construct meet the MICOM criteria. Table 6 shows that all correlation c -values exceeded their respective 5% quantiles of C_u , confirming compositional invariance for all constructs. This suggests that the relationships between the variables are similar across China and Malaysia. In the third step, composite equality was assessed by examining the mean and variance differences for each construct across the two countries (Matthews, 2017). Specifically, composite equality assesses if the differences in the original mean values and original variance values are contained within the established confidence intervals. If both mean and variance differences fall within the intervals, full invariance is demonstrated; if only one falls within the interval, partial invariance is achieved. As shown in Table 6, full measurement invariance was found only for switching costs, meaning that switching costs was invariant across both countries. However, partial invariance was observed for incentive policy, with the difference in the composite variance ratio falling within the confidence interval for variance, but not for mean. For the other constructs,

Table 6
Measurement invariance testing results using MICOM (China vs. Malaysia).

Constructs	Step 1			Step 2	Compositional invariance	Step 3 (a)		Step 3 (b)		Full Measurement Invariance
	Configurational Invariance	Correlation c-value	5 % quantile of Cu			Difference in the composite variance ratio	95 % confidence interval	Difference in the composite variance ratio	95 % confidence interval	
DTEV	Yes	0.999	0.997	Yes		-0.750	-0.106, 0.107	-0.840	-0.097, 0.090	No/No
CP	Yes	0.998	0.995	Yes		-0.182	-0.112, 0.106	-0.707	-0.150, 0.150	No/No
PV	Yes	0.999	0.998	Yes		-0.307	-0.103, 0.113	-0.839	-0.136, 0.129	No/No
IP	Yes	0.998	0.995	Yes		-0.059	-0.107, 0.106	-1.105	-0.126, 0.128	Yes/No
SI	Yes	1.000	0.969	Yes		1.140	-0.104, 0.113	-0.972	-0.084, 0.088	No/No
SC	Yes	1.000	0.999	Yes		-0.067	-0.104, 0.102	0.137	-0.189, 0.188	Yes/Yes
INE	Yes	1.000	0.992	Yes		1.040	-0.113, 0.104	-0.699	-0.087, 0.096	No/No
GSI	Yes	0.999	0.998	Yes		-0.383	-0.109, 0.106	-0.938	-0.112, 0.112	No/No
SIAE	Yes	1.000	0.998	Yes		0.374	-0.110, 0.112	-0.866	-0.137, 0.145	No/No

including dissatisfaction with traditional fuel vehicles, cost pressure, perceived value, social influence, inertia, green self-identity, and switching intention to adopt EVs, neither the mean nor the variance differences fell within the confidence intervals, indicating no full invariance across these constructs.

Following the confirmation of measurement invariance, the study employed Partial Least Squares Multi-Group Analysis (PLS-MGA) to explore the differing influences of factors on the switching intention to adopt EVs in China and Malaysia. Nonparametric methods such as Henseler's MGA (Henseler et al., 2009) and the permutation test (Chin & Dibbern, 2010) were utilized to ensure robust analysis. By using both methods, the study strengthens the reliability of the results and provides a comprehensive validation of the findings (Yu, Teoh, Bian, et al., 2025). Henseler's MGA evaluates group-specific bootstrap estimates, identifying significant differences in path coefficients between groups when p-values are under 0.05 or over 0.95 (Henseler et al., 2009). Likewise, the permutation test generated p-values, with a significance threshold of 5 %, meaning differences were considered significant if the p-value fell below 0.05.

As shown in Table 7, there were significant differences in path coefficients for China and Malaysia, specifically for H2, H6, H7, H8a, H8d, and H9e. For H2, cost pressures had a stronger impact on the intention to switch to EVs in China than in Malaysia. Both MGA methods yielded a p-value of less than 0.001 for this difference. This implies that cost-related factors are more influential in encouraging EV adoption in China than in Malaysia. For H6, switching costs negatively impacted the intention to switch to EVs in both countries, but this effect was far stronger in China ($\beta = -0.433$) than in Malaysia ($\beta = -0.191$). Significant differences were observed for both MGA methods ($p < 0.001$), indicating that higher switching costs pose a greater barrier to EV adoption in China than in Malaysia. In H6, switching costs negatively impacted switching intention in both countries, but the effect was far stronger in China ($\beta = -0.433$) compared to Malaysia ($\beta = -0.191$). Significant differences were observed in both MGA methods (p-value difference < 0.001), indicating that higher switching costs pose a more substantial barrier to EV adoption in China. Regarding H7, inertia was found to negatively and significantly affect switching intention in Malaysia ($p < 0.001$), but not in China. The path coefficient difference (0.153, p-value difference < 0.001) suggests that consumer inertia plays a more prominent role in Malaysia, likely due to stronger resistance to change or entrenched behaviors among Malaysian consumers. For H8a, green self-identity had a stronger moderating effect on the link between dissatisfaction with traditional fuel vehicles and the intention to switch in Malaysia ($\beta =$

0.213) than in China ($\beta = 0.033$). Both MGA methods indicated significant differences (p-value difference < 0.001), suggesting that environmentally conscious individuals in Malaysia are more inclined to switch from traditional vehicles. In H8d, green self-identity significantly moderated the impact of incentive policies on switching intention in Malaysia (p-value < 0.05), whereas this effect was not significant in China. The path coefficient difference (-0.132 , p-value difference < 0.05) highlights how incentive policies resonate more with environmentally conscious individuals in Malaysia than in China. Lastly, in H9e, the findings indicated that green self-identity positively influenced the association between social influence and switching intention in China ($\beta = 0.097$, p-value < 0.05), while it had a negative, though insignificant, effect in Malaysia ($\beta = -0.056$, p-value > 0.05). The significant path coefficient difference (0.153, p-value difference < 0.05) suggests that environmentally conscious individuals in China are more affected by social factors, whereas this effect is minimal in Malaysia.

5. Discussion

This study offers important insights into the determinants influencing the intention to switch to EVs in China and Malaysia, highlighting key similarities and differences across the two countries. The findings support several hypotheses related to dissatisfaction with traditional fuel vehicles, cost pressure, perceived value, incentive policy, social influence, switching costs, inertia, and the moderating role of green self-identity in shaping these relationships.

Firstly, dissatisfaction with traditional fuel vehicles was found to positively influence switching intention in both China and Malaysia, supporting the first hypothesis. This suggests that consumers in both countries are motivated to switch to EVs due to dissatisfaction with conventional fuel-powered vehicles, particularly in terms of environmental and cost concerns (Li et al., 2022; Wu et al., 2019). This finding aligns with prior studies showing that dissatisfaction with the current vehicle market can push consumers toward greener alternatives (Cruz-Jesus et al., 2023; Hu et al., 2023a). Cost pressure was another significant driver of switching intention in both countries, with a stronger impact observed in China, as shown by the higher path coefficient and significant differences in the multi-group analysis. This indicates that cost concerns, including fuel savings and long-term operational costs, are more critical for Chinese consumers compared to their Malaysian counterparts. This difference may indicate a stronger emphasis on economic considerations in China, where consumers exhibit particular sensitivity to price factors during decision-making (Hu

Table 7
Multi-group analysis results.

H	Relationship	Path coefficient		T-values		P-values		Confidence interval (95%)		Path coefficient differences		F-value difference Permutation	Supported
		China	Malaysia	China	Malaysia	China	Malaysia	China	Malaysia	China	Malaysia		
H1	DTW→SAE	0.079	0.142	2.965	2.963	0.003**	0.003**	0.031	0.134	0.238	-0.063	0.317	No/No
H2	CP→SAE	0.065	0.127	2.362	2.362	0.003**	0.003**	0.037	0.115	0.210	-0.083	0.310	Yes/Yes
H3	TP→SAE	0.065	0.124	2.248	2.292	0.003**	0.003**	0.038	0.115	0.210	-0.083	0.318	No/No
H4	IP→SAE	0.099	0.157	3.054	3.059	0.002**	0.002**	0.027	0.163	0.259	-0.058	0.340	No/No
H5	SC→SAE	0.099	0.024	2.809	1.796	0.005**	0.005**	0.023	0.100	0.153	0.025	0.445	No/No
H6	SE→SAE	-0.033	-0.191	10.286	4.330	0.000**	0.000**	-0.017	-0.351	-0.380	-0.242	0.000	Yes/Yes
H7	INE→SAE	-0.020	-0.173	0.757	4.576	0.449	0.000**	-0.060	0.027	-0.247	-0.100	0.010	Yes/Yes
H8a	GSI×DTW→SAE	0.033	0.213	1.028	3.519	0.304	0.000**	-0.028	0.088	-0.288	-0.137	0.000	Yes/Yes
H8b	GSI×CP→SAE	0.107	0.094	2.581	3.557	0.010*	0.000**	0.026	0.187	0.043	0.146	0.013	Yes/Yes
H8c	GSI×TP→SAE	-0.021	-0.007	0.680	0.156	0.496	0.876	-0.180	0.041	-0.105	0.080	0.779	No/No
H8d	GSI×IP→SAE	-0.038	0.094	1.119	2.113	0.263	0.035*	-0.105	0.026	0.007	0.180	0.805	Yes/Yes
H8e	GSI×SI→SAE	0.097	-0.056	2.469	1.473	0.014*	0.141	0.021	0.173	-0.131	0.016	0.030	Yes/Yes
H8f	GSI×SC→SAE	-0.107	-0.097	2.690	2.339	0.007**	0.019*	0.029	0.186	-0.173	-0.013	0.015	Yes/Yes
H8g	GSI×INE→SAE	0.034	0.003	1.204	0.084	0.229	0.933	-0.021	0.090	-0.071	0.087	0.876	No/No
												0.616	No/No

Note: A p-value below 0.05 or above 0.95 suggests significant differences (at the 5 % level) in specific path coefficients across the two groups for the Henseler's MGA method.

*p < 0.05, **p < 0.01 and ***p < 0.001.

et al., 2023a; Wang et al., 2022). Perceived value significantly impacted switching intention in both China and Malaysia (Asadi et al., 2022; Zhang et al., 2022), suggesting that consumers in both nations view EVs as providing greater overall value, likely due to benefits such as long-term cost savings, environmental advantages, and advancements in technology (Asadi et al., 2022; Hu et al., 2023; Karupplah & Ramayah, 2022). The association between perceived value and switching intention reflects a growing consumer awareness of EV benefits beyond just financial savings (Asadi et al., 2021). Incentive policies also had a significant effect on switching intention in both countries, indicating that government incentives like subsidies, tax breaks, and rebates are effective mechanisms for encouraging EV adoption (Adnan et al., 2018; Asadi et al., 2022; Jain et al., 2022). This finding is particularly relevant in the context of Malaysia, where the path coefficient for incentive policy was higher than in China, highlighting the importance of strong policy support in driving EV adoption in emerging markets (Asadi et al., 2021, 2022). Social influence has a more prominent role in influencing EV adoption in China, supporting the fifth hypothesis specifically within the Chinese context. This outcome suggests that social dynamics, such as peer influence and family or friend opinions, are more impactful in driving EV adoption in China (Jain et al., 2022; Si et al., 2022). In Malaysia, however, the lack of a significant relationship implies that consumers might prioritize individual preferences or economic factors over social influences in their adoption decisions. Switching costs negatively impacted switching intention in both countries, with a stronger adverse effect noted in China. The results indicate that higher costs, encompassing financial, logistical, and psychological burdens tied to transitioning to EVs, serve as a more substantial obstacle in China. This highlights the importance of implementing policies and incentives to reduce perceived switching costs, especially in markets where consumers show heightened sensitivity to such barriers (Li et al., 2021; Truong et al., 2024; S. Wang, Wang, & Yang, 2020). Inertia did not significantly impact switching intention in China but had a notable negative effect in Malaysia, supporting the seventh hypothesis only in the Malaysian context. This indicates that habitual behaviors and resistance to change are more influential in hindering EV adoption in Malaysia (Asadi et al., 2023; Khazaei & Tareq, 2021). Addressing consumer inertia with targeted marketing and educational initiatives could be key to fostering adoption in this market.

Regarding the influence of green self-identity as a moderator, the study found notable differences between China and Malaysia. Green self-identity influenced the link between dissatisfaction with traditional fuel vehicles and the intention to switch only in Malaysia, indicating that environmentally conscious consumers in Malaysia are more inclined to adopt EVs when dissatisfied with traditional fuel vehicles. This finding reflects the growing environmental awareness in Malaysia and the potential for green identity to drive sustainable consumption behavior (Adnan et al., 2018; Asadi et al., 2022; Khazaei & Tareq, 2021). Green self-identity additionally influenced the connection between cost pressure and switching intention in both countries, confirming that consumers with a pronounced green identity tend to respond positively to cost-related factors in their decision to adopt EVs. One possible explanation for the stronger moderating effect of green self-identity in Malaysia compared to China is the difference in societal emphasis on environmentalism and policy engagement. Malaysia has seen an increasing integration of green values into consumer culture, driven by targeted government initiatives, awareness campaigns, and a growing eco-conscious middle class (Asadi et al., 2022). In contrast, while environmental concerns are present in China, they may not yet exert the same level of personal influence on individual decision-making due to the dominance of broader economic and infrastructural considerations in consumer choices (Ehsan et al., 2024). This aligns with findings suggesting that cultural and policy environments can shape the salience of environmental identity in purchasing behaviors (Yang et al., 2024). However, green self-identity did not have a significant moderating impact on the link between perceived value and switching intention in

either country, leading to the rejection of the hypothesis related to this factor. This suggests that green identity does not play a significant role in shaping consumers' perceptions of the value of EVs, which is not investigated in the research (Cruz-Jesus et al., 2023; Hu et al., 2023b). The moderating effect of green self-identity on the relationship between incentive policy and switching intention was significant in Malaysia but not in China, which may be attributed to Malaysia's reliance on government-driven incentive programs to promote EV adoption. Malaysian consumers with a strong green self-identity may perceive such incentives as aligning with their environmental values, reinforcing their motivation to switch (Sang & Bekhet, 2015). In contrast, Chinese consumers, while influenced by incentives, might be more driven by pragmatic concerns such as infrastructure availability and vehicle performance (Wang et al., 2021), diluting the moderating impact of green identity. Additionally, green self-identity positively moderated the relationship between social influence and switching intention in China but not in Malaysia, indicating that green self-identity enhances the impact of social factors on adoption decisions in China. Lastly, green self-identity significantly moderated the relationship between switching costs and switching intention in both countries, confirming that consumers with a strong green identity are less deterred by switching costs (Jain et al., 2022). However, green self-identity did not moderate the relationship between inertia and switching intention in either country, resulting in the rejection of the hypothesis related to this relationship, which is not examined in prior studies (Cruz-Jesus et al., 2023; Hu et al., 2023b).

6. Implications

6.1. Theoretical implications

The findings from this research provide substantial insights into the theoretical understanding of the intention to switch to EV adoption across distinct cultural and market contexts, specifically China and Malaysia. This comparative analysis offers several important theoretical contributions that enhance the existing literature on consumer behavior, sustainable transportation, and EV adoption.

First, this study reinforces existing consumer behavior theories by confirming the role of dissatisfaction with traditional fuel vehicles as a key driver of switching intention in both China and Malaysia. The finding that dissatisfaction with the environmental and economic impacts of conventional vehicles motivates EV adoption aligns with prior research (Cruz-Jesus et al., 2023; Nguyen et al., 2024). However, this study extends the literature by demonstrating that dissatisfaction serves as a universal motivator across different national contexts, emphasizing its relevance in cross-cultural sustainable consumption research (Hsieh, 2021). Second, the identification of cost pressure as an important determinant of switching intention in both countries, with a stronger effect in China, adds new insights to economic decision-making frameworks. While previous studies highlight financial factors as key drivers of EV adoption, this study provides novel evidence that cost considerations have a disproportionately stronger impact in China, likely due to differences in economic structures and market conditions (Hoerler et al., 2023; Hu et al., 2023a). This finding strengthens the application of economic theories of consumer behavior by illustrating the varying weight of financial concerns in different national contexts (Cruz-Jesus et al., 2023; Tamakloe & Caesar, 2024).

Moreover, the study confirms the role of perceived value as a significant predictor of switching intention in both China and Malaysia, supporting value-based theories in sustainable consumer behavior. Consumers in both countries perceive EVs as offering superior value in terms of environmental benefits, technological advancements, and long-term cost savings. While prior research has recognized perceived value as a driver of EV adoption, this study contributes to the literature by emphasizing how perceived environmental and economic benefits collectively influence consumer adoption decisions, reinforcing the

broader applicability of perceived value theory (Almansour, 2022; Singh et al., 2020; Upadhyay & Kamble, 2023). Furthermore, the study underscores the significance of government policy interventions, such as incentives aimed at encouraging EV adoption. The impact of incentive policies on switching intention in both China and Malaysia aligns with policy-driven models of technology adoption (Wang et al., 2017, 2022). However, a novel contribution of this study is the finding that incentive policies play a more substantial role in Malaysia, highlighting that in emerging markets with higher economic barriers, government intervention is even more critical for promoting EV adoption (Asadi et al., 2021, 2022; Khazaei & Tareq, 2021). Additionally, the differential role of social influence in the two countries adds complexity to existing literature on social factors in technology adoption. While social influence significantly impacts switching intention in China, its lack of significance in Malaysia challenges the assumption that social influence is a universal driver of EV adoption. This finding advances social influence theory by highlighting that its effect varies across cultural contexts, with stronger relevance in collectivist societies like China, where peer influence is more impactful in shaping consumer behavior (Lin et al., 2017; Mishra & Maity, 2021).

Finally, this study provides new theoretical insights into the moderating role of green self-identity in EV adoption. Green self-identity enhances the influence of dissatisfaction with traditional fuel vehicles, cost pressure, incentive policy, and social influence on switching intention, but its impact differs across China and Malaysia. This extends the literature on identity theory and sustainable consumption by demonstrating that while environmentally conscious individuals are generally more likely to adopt sustainable technologies, the extent of green self-identity's influence depends on cultural and market-specific factors. The stronger moderating effect observed in Malaysia suggests that green identity is more salient in contexts where government policies and public awareness campaigns actively promote sustainability, reinforcing the need for context-specific sustainability research (Cruz-Jesus et al., 2023; Karupiah & Ramayah, 2022).

6.2. Practical implications

The findings of this study present substantial practical implications for policymakers, marketers, and stakeholders in the EV industry in both China and Malaysia. Understanding the drivers of switching intention toward EV adoption can guide the development of targeted strategies to enhance adoption rates, promote sustainable transportation, and support environmental goals.

First, policymakers should focus on enhancing the awareness of dissatisfaction with traditional fuel vehicles among consumers. Given the strong link between dissatisfaction and switching intention across China and Malaysia, government initiatives aimed at educating consumers about the limitations and environmental impacts of conventional vehicles can effectively encourage EV adoption. Promotional campaigns that emphasize the advantages of EVs, such as decreased emissions and cost-effective operation, can resonate with consumers and foster a desire to switch (Ilahi et al., 2024; S. Wang, Wang, & Yang, 2020). Second, recognizing the critical role of cost pressure in influencing switching intention, stakeholders should prioritize measures to reduce the overall cost of EVs. In China, where cost pressure has a stronger impact, policymakers could consider subsidies or incentives aimed at reducing purchase prices. Additionally, manufacturers can explore strategies to lower production costs, which can ultimately lead to more competitive pricing for consumers. In Malaysia, although cost pressure has a positive effect, it is less pronounced, indicating that a focus on value perception, alongside cost reduction, may be necessary.

Moreover, marketers should leverage perceived value in their communication strategies. The strong positive impact of perceived value on switching intention suggests that marketing campaigns should emphasize the overall value proposition offered by EVs, such as long-term cost savings, environmental benefits, and advancements in

technology. Providing consumers with clear information on long-term benefits can enhance perceived value and drive switching intention. Furthermore, the effectiveness of incentive policies in influencing switching intention underscores the crucial role of government support in advancing EV adoption. Policymakers in both countries should consider expanding and enhancing existing incentive programs like tax reductions, grants, or purchase subsidies for EVs (Adnan et al., 2018; Almansour, 2022; Tamakloe & Caesar, 2024). In Malaysia, where the impact of incentives is particularly significant, tailored incentives for environmentally conscious individuals could further stimulate adoption. Collaborating with automotive manufacturers to provide attractive financing options can also make EVs more accessible (Tamakloe & Caesar, 2024). Additionally, the differential impact of social influence on switching intention in China compared to Malaysia suggests that marketing strategies should be tailored to cultural contexts. In China, where social influence plays a significant role, marketing campaigns could leverage testimonials, social proof, and community endorsements to motivate consumers toward EV adoption (Sun et al., 2022). In Malaysia, strategies could focus more on individual benefits, underscoring personal savings and environmental advantages.

Finally, the differing importance of green self-identity as a moderator between core factors and switching intention underscores the need for targeted marketing approaches. Marketers can appeal to environmentally conscious consumers by aligning EV ownership with green self-identity (Cruz-Jesus et al., 2023; Karuppiyah & Ramayah, 2022). Campaigns that resonate with the values and identities of these individuals are likely to strengthen their inclination to switch to EVs.

7. Limitations and directions for future work

While this study offers significant insights into the determinants of switching intention toward EV adoption in China and Malaysia, certain limitations deserve attention. First, the research depends largely on self-reported responses from survey participants, which may introduce biases like social desirability and recall limitations. Future studies could adopt mixed-method approaches, incorporating qualitative methods such as in-depth interviews or group discussions to gain richer insights into consumer motivations and behavior surrounding EV adoption. Additionally, although this study focuses on green self-identity as a moderator, it does not encompass regional variations within each country. China and Malaysia have diverse populations with differing economic conditions, infrastructure levels, and environmental awareness. Future research should consider these regional disparities to better understand the influence of local factors on switching intentions. Furthermore, this study primarily explores green self-identity as a moderating variable; other potential moderating variables, including socioeconomic status, age, and educational attainment, may also impact switching intention. Investigating these additional variables could yield a more holistic model of EV adoption. While the study employed stratified sampling techniques to ensure demographic balance, no specific efforts were made to guarantee that the sample demographics (age, gender, income, education) were fully representative of the broader population in China and Malaysia. Therefore, the findings may not be entirely generalizable to all segments of the population in these countries. This limitation should be acknowledged, and future studies may consider adjusting for these demographic discrepancies or using a more representative sampling strategy. Lastly, the rapid evolution of EV technology and shifting government policies can significantly reshape consumer perceptions and behaviors. Longitudinal research that examines changes over time could offer valuable insights into how evolving market conditions affect the determinants of switching intentions toward EVs. By addressing these limitations and pursuing these research directions, scholars and practitioners can build a more detailed understanding of EV adoption and develop more effective strategies for advancing sustainable transportation solutions.

CRediT authorship contribution statement

Teng Yu: Writing – original draft, Software, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Ai Ping Teoh:** Validation, Software, Project administration, Formal analysis. **Junyun Liao:** Writing – review & editing, Resources, Methodology, Funding acquisition. **Chengliang Wang:** Software, Methodology, Data curation, Conceptualization.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.techsoc.2025.102949>.

Data availability

Data will be made available on request.

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