The Kontsevich-Zorich cocycle is a dynamical system on the total space of the Hodge bundle over the moduli space of abelian or quadratic differentials. The Kontsevich-Zorich spectrum plays an important role in applications of Teichmüller theory to the dynamics of translation flows and interval exchange transformations. A cyclic cover of the complex projective line branched at four points has the structure of a square-tiled surface. In this article, the authors study these square-tiled cyclic covers. They generalize the construction of the square-tiled cyclic covers and derive the topological, geometric and combinatorial properties of the corresponding translation and half-translation surfaces as well as the Teichmüller curve. The spectrum of the Lyapunov exponents of the determinant bundle over the Teichmüller curve with respect to the geodesic flow is computed. A new example of a Teichmüller curve of a square-tiled cyclic cover in a stratum of abelian differentials in genus four with a maximally degenerate Kontsevich-Zorich spectrum is provided. Several new examples of Teichmüller curves in strata of holomorphic and meromorphic quadratic differentials with a maximally degenerate Kontsevich-Zorich spectrum are also presented. It is proved that, within the class of square-tiled cyclic covers, these examples exhaust all possible Teichmüller curves with maximally degenerate spectra.

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Note: This list reflects references listed in the original paper as accurately as possible with no attempt to correct errors.

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